Changing the change proceedings

Edited by
Carla Cipolla
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Changing the Change
Design, Visions, Proposals and Tools
Proceedings

Edited by Carla Cipolla (Politecnico di Milano), Pier Paolo Peruccio (Politecnico di Torino)

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BEDA - The Bureau of European Design Associations
IFI - The International Federation of Interior Architects/ Designers

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The Conference

Something that we know very well about the present is that the world is changing, rapidly and profoundly. The only certain thing that we know about the future is that the current change must change direction. It must find the way to sustainability.

Nobody is yet in a position to say how this can happen. However, many think that the greatest challenge we must face is this one: how to be an active, constructive part of this twofold transformation; and how to be able to interpret the way and the extent to which we are changing, recognising the opportunities that are opening up, and the forces that generate this change. We should learn to use these same forces to "change the change" and promote a social learning process that can lead us towards a society based on networking, knowledge and sustainability.

Contemporary design (seen as the community of all who operate in the design field in different ways) is deep in this turbulent process, both transforming it and being transformed by it. Given its nature it cannot but be like this. However, in this turbulence, we do not have, and cannot have, a clear vision of what is happening. What is design doing today? What could it be like in future and how will it operate in this context of ongoing transformation? What is it doing, or what could it be doing, to play a more incisive critical and constructive role in the great twofold transformation underway?

These are not new questions, but they must constantly be asked. Not only because the world is rapidly changing, but also because despite the good intentions of many, design still continues to be far more "part of the problem" than "part of the solution"; serving more to accelerate unsustainable processes rather than promoting new ways of being and doing to help individuals and communities live better, reduce their ecological footprint and regenerate the social fabric.

Aims

The Conference moves from these considerations and intends to present visions, proposals and tools that emerge from precise design research activities. If indeed design wants to be "part of the solution" it must, perhaps first and foremost, develop a new research culture and new research practices: an open research, sensitive to present contexts, that leads to a better understanding of the great changes underway and of what should be done to re-orient them towards sustainability.

In this spirit the Conference seeks to be a confrontation and discussion ground for designers and researchers operating in different cultural, economic and political contexts (in this perspective, a substantial participation from the East and South of the World has been actively encouraged).

Changing the Change is a design research conference with a strong and ambitious political goal: to focus on the design research potentialities in the transition towards a sustainable knowledge society; to show that these potentialities exist and can be found in all the design application fields (from products to communication, from interiors to services, from ITC to crafts, from medical devices to fashion) and in all the regions of the world (from the most mature industrial societies to the emerging ones). To do all that, the Conference will present and discuss visions, proposals and tools developed by design researchers dealing with various aspects of peoples lives: from food, to health, from residence to mobility, from work to tourism.

Ezio Manzini
Politecnico di Milano, Conference scientific coordinator

www.changingthechange.org

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1. Proceedings structure overview

Background documents

Changing the Change proceedings include, other than the selected papers, some background documents. These are:

1. *Presentation by organizers*: it intends to outline different aspects of the conference results and potencial directions (about future steps to be taken).

2. *DRAS – The Design Research Agenda for Sustainability. A* series of activities, called emerging issues process (a *round table,* an *international project session*, an *open discussion*) aimed to produce - in a participatory way - the final output of the conference and to make the first steps in possible post-conference initiatives. These initiatives have produced a final document in the form of a short text pinpointing emerging issues and indicating promising directions of research. It was called DRAS: *Design research agenda for sustainability* .

3. *Invited speakers papers.* International speakers have been asked to give an overview of their countries or regions in terms of design research and its contributions in changing the change. As a whole, they have outlined the state of design research for sustainability worldwide. The papers received by them have been included in this publication.

Selected papers by theme

The Conference field of interest – and the selected papers presented in these proceedings – have been divided into 6 themes and, each of them, in 4 sub-themes, generating the 24 modules in which the selected papers are presented. The 6 themes are generated splitting in two the original three ones, that were: *visions, proposals* and *tools*.

VISIONS.

These sessions present research results that lead us to imagine possible worlds, or parts of possible worlds. They include the results of activities in the field of scenario design and more general visions produced by research into specific products, communications and services. They also includes a comparative analysis of visions emerging from design history and from a comparison of different cultures.

Theme 1. Visions /Ways of living
(Scenarios/1, Scenarios/2, Ideas/1, Ideas/2)

Theme 2. Visions / Ways of producing
(Models of development/1, Models of development/2, Production systems/1, Production systems/2)

PROPOSALS.

These sessions present results of design research that give rise to concrete solutions containing elements of systemic innovation. They are also legible as concrete steps towards a new generation of sustainable products, services and systems. So, products, services and product and service systems are proposed along with the communicative artefacts that link several actors and artefacts together. It also proposes places for a new everyday life, the activities that take place within them and the new production and consumption networks that emerge from them.

Theme 3. Proposals / Daily life solutions
(Services and places/1, Services and Places/2, Products and technologies/1, Products and technologies/2)

Theme 4. Proposals / Enabling Systems
(Tourism and mapping, Energy and packaging, Networking/1, Networking/2)

TOOLS.

These sessions present the results of research that aims to redefine and develop conceptual and operational tools which enable designers to operate within change and influence its direction. Such tools enable them to participate constructively in new design networks, and deal with emerging problems. Tools may be proposed for conceptualisation and representation, for calculation and appraisal of results or for stimulation and prototype making.

Theme 5. Tools / Design Theories
(Design education/1, Design Education/2, Design culture/1, Design culture/2)

Theme 6. Tools / Design Methods
(Design thinking/1, Design thinking/2, Design process/1, Design process/2)

2. Background documents

2.1 Presentations by the conference organizers

New Design Knowledge

Introduction to the conference Changing the Change

Ezio Manzini[1] (12.7.08)

Being a designer means being an optimist. Given problems – even the most difficult problems – all we can do is to presume the possibility of solving them. This is not because we do not see difficulties. Designers must be realists. We presume that we can solve problems because we have no alternative. To be designers, we must make proposals, and we base these proposals on the opportunities we meet.

Faced with a world drifting rapidly towards catastrophe, it seems to me that we need this sense of a designer's realism and optimism more then ever. We must see the problems, and we must think that in spite of everything, it is possible to solve these problems. We must find solutions. This is why we are all here today.

A Conference as Occasion for Research

Changing the Change is a conference for designers and so the spirit of the conference is a designer's realistic optimism. It is based on two main ideas, which we can call optimistic-realistic. The first is that the change in progress towards a society that calls itself network and knowledge based, yet is still as unsustainable as what we had before, if not more so, can be re-oriented towards sustainability. The second is that the designer community can play a positive role in this necessary re-orientation and that this can be done by building new design knowledge.

Therefore, Changing the Change is a conference of designer-researchers who gather to discuss the state of the art and to consider how to create new design knowledge. We do so accepting the challenge of a transition towards a network society and a knowledge society while making the transition towards sustainability.

In organizing the conference, we have done our best to make it a serious event, properly accredited in academic terms. However, we have also done all we could to avoid a value neutral conference, a conference without values.

[1] Full professor, Politecnico di Milano (ITALY) – Conference Scientific Coordinator

More than any other kind of research, design research cannot be separated from the purpose and the social significance of its results. Today, facing grave social and environmental problems, we cannot remain neutral. Every research project we start must take a stand. Whatever the specific question, we cannot forget the need to consider our actions as a contribution to the sustainability of the systems in which we work. This involves all the systems for which we are working – environmental, social, economic and even aesthetic.

So this is the first message this conference seeks to communicate. Today, sustainability must be the meta-objective of every possible design research activity. It should not be a specialized sector along with other specialized sectors as it has been in recent years.

It is likely that no one would disagree with this statement. Who wants to design and or conduct design research in a way that leads to unsustainability? Nevertheless, we must take the term sustainability for what it effectively means – a radical change in ways of being and doing. From these words, we must move to concrete actions. If we do, things will change.

What would it really mean to bring research for sustainability into every design discipline and all areas of design research? How can we bring design research out of the straits of what green design, ecodesign, and sustainable design have been up to now?

In the face of these questions, Changing the Change is itself an occasion for research. Our call for papers was an international inquiry among researchers to see what they are working on. This enabled us to map out what we mean today when we talk about design research for sustainability. It also helped us to map what we are actually doing in the field.

The same is true of the invited speakers that we asked to critically outline the shape of these themes in their various regions.

Together these became a survey based on the opinions of a select group of privileged interlocutors.

Finally, the conference will involve an open discussion stream starting with a round table and continuing into free discussions. Our goal is to bring important issues into focus. Finally, the conference is an exercise in collaborative creation of possible lines of action that will become a Design Research Agenda for Sustainability.

Research and Design Knowledge

Much recent discussion on design research focuses on methodological aspects. I would like to focus above all on results with a simple working definition:

Design research is an activity that aims to produce knowledge useful to those who design: design knowledge that designer and non-designer (individuals, communities, institutions, companies) can use in their processes of designing and co-designing.

From here, discussion on the nature and quality of design research can move from a discussion methods where it has largely been centered until now to results. This is the issue of the knowledge design research has produced, its nature and quality, and therefore ways of getting hold of it.

In terms of content, design knowledge is a collection of different cognitive artifacts with different purposes. These include visions to stimulate and steer strategic discussion; proposals to integrate into the development of specific projects; tools to help understand the state of things and implement design ideas; along with reflections on the sense of what we are doing or could do.

However, the design knowledge we are talking about can also be described in terms of form. It must be explicit, discussable, transferable, and accumulable. It must be knowledge that can be clearly expressed by whoever produces it, discussed by anyone who is interested, applied by other designers, and it must become the starting point that allows other researchers to produce further knowledge.

Starting from the results, it is possible to outline other research methods of various kinds and methodologies that allow us to study them in comparison with one another. Research that

produces conceptual and operational tools for designing or research that helps us to understand the nature of what we are designing is research for and on design. We usually conduct this research by adopting methods proper to disciplines endowed with a consolidated research tradition, adapting them to our specific requirements. In the field of research for design, this typically includes ethnography, semiotics, ergonomics and various technological and economic disciplines. In research on design, this often means history, sociology or philosophy.

Conversely, research that produces visions and proposals usually adopts original methods, using tools and skills proper to designer culture and practice for research through design. In this case, the research modes are, and must clearly be, different from those of traditional scientific research. Research through design necessarily brings into play a level of subjectivity that would be inadmissible in scientific tradition. Nevertheless, this is not typical “artistic research,” totally guided by the subjective dimension. Design is a discipline that combines creativity and subjectivity with a dose of reflection and arguments on its own choices. The same is obviously true for research through design, with the added factor in this case that the knowledge produced cannot be implicit and integrated in the design but, as we said, it must be explicit, discussable, transferable, and accumulable.

The specific acceptable level of subjectivity in design through research is an open question. We have discussed this and we can continue to do so, but I do not believe that a precise definition of this limit is of such great interest. Going back to where we started, I believe that what is really important are to discuss the results we have achieved case by case and the contribution they can bring to solving the problems we have to face. Obviously these contributions will be solid if the methodologies we adopt are too.

A Context in Transformation

“Every project design is based on good research.” I heard this affirmation many times in the past to mean that the speaker did not understand why it was necessary to talk about specific, autonomous design research activity. I haven’t heard the phrase repeated for some time now. However, I think it is still true and it can be used to assert the necessity of autonomous design research. Indeed, if we update the terms, it would sound something like this: every good complex project requires good design research.

In order to justify this statement we must enlarge on the subject a little. I will do so very briefly by taking up the sense of the conference title.

To work as agents for sustainability, designers must take a couple of steps forward in understanding the context in which they are operating. They must understand change already in progress better than they sometimes do. This means the transition towards a network society and a knowledge society. Let’s call this Change 1. They must understand equally well the change required to re-orient the change in progress towards sustainability. Let’s call this Change 2.

This is not at all easy. Change 1 is generating system transformations that require of all social actors to use new ways of thinking and acting with totally new artifacts, organizational forms and designing networks. This includes designers. These change require designers to rethink themselves, to rethink how they operate and reshape their position in society.

This new operational situation creates the context in which Change 2 must take place. This is the change that we need to move towards sustainability. This change also concerns systems and this introduces issues that have never before been faced from commons regeneration to time ecology, from the new nature of communities to the one of places. I shall come back to these later.

The expression Changing the Change refers to a profound social, cultural and economic transformation. For this transformation to take place, we require a complex social learning process. This process in turn requires an original mix of reflection and creativity, of visionary and concrete thinking, of ability to propose and ability to listen. In short, this requires a diffused designing capability and therefore design knowledge that is able to help individuals, communities, institutions and companies to design feasible, sustainable solutions in the social and operational framework of

a network society and a knowledge society. By doing this, we can steer the future towards sustainability.

However, this last phrase is too dense and intricate, so I'd like to try to disentangle it. To do so, I wish to go back to our original question. Why do we need autonomous design knowledge and design research? In other words, why do we need knowledge and research that are independent of the specifics of any individual project?

Change 1 and Change 2

There are many transformations underway in the production and consumption system in what we have called Change 1. The problems that we face in this change tend to grow in size and complexity and the time we have to solve them tends to shrink. This means that we cannot produce the design knowledge we require each time and every time in the traditional way for each individual project. The cost is too high and few projects can shoulder all the costs of design research. Time is too short and few projects can afford a development period as long as the period we require for "good design based on good research."

It is therefore necessary to develop design knowledge that can be produced in the most appropriate time and ways, and applied rapidly, when and where needed.

In addition, another factor emerges from the nature of Change 1. In the transition towards a network society and a knowledge society, design processes tend to be increasingly distributed between numerous actors differing in culture, motivation and professional development. In these conditions, traditional design knowledge, accumulated in the implicit knowledge of professional designers, is no longer enough.

Too many subjects are involved. They are not in the same place and many are not designers at all. In this case, too, a good design requires good research. However, in this case good research must produce knowledge that we can circulate through the network. This means explicit, communicable design knowledge, transferable to different applications.

We can therefore say that Change 1 leads to a diffuse demand for new design knowledge. This claim requires two points of clarification.

The first is that the new demand is already visible. Until now, however, it has not often been explicitly stated. In my opinion however, the situation is quickly changing. The most evident signs of this change are the design research activities of recent years that have begun to develop in design agencies and in more clearly design-orientated companies.

The second clarification we need to avoid misunderstanding is that the emergence of an extensive demand for design research is not in itself a good thing. The design knowledge we require is not necessarily oriented in a direction that we can judge positively. Like all of Change 1, and like all that concerns the role of design, the design knowledge we generate through new research may be positive or negative.

The question of the transition towards sustainability that we have called Change 2 is set against this dynamic, problem-laden background. It does not require much imagination to say that this transition also gives rise to an enormous demand for design knowledge. This transition towards sustainability must see the germination and consolidation of a new idea of well being and a new production system that will make it possible to live better while reducing the weight of our activities on the environment. We must also regenerate the physical, social, and cultural quality of places, and the physical, social, and cultural quality of the planet as a whole. All this can be imagined as a great co-creation phenomenon, where different individuals and communities interact in a vast process of social learning and innovation. This process generates, and is itself regenerated by, new design knowledge.

Lessons Learned and Sustainable Quality

Nobody can really say what a sustainable society will be like -- how people will live and on what residential and production systems their existence could be based. Nevertheless, more than 20 years of discussion and experience have taught us something. Here, I would like to mention three of these lessons. These three lessons seem to me most useful in indicating directions to work along.

1. Research on eco-efficiency has been successful, but it has not improved the overall picture. Current products and services, taken one by one, use far less energy and materials than those of some decades ago. However, no indicator of aggregate consumption (residence, mobility, tourism, etc.) indicates a decrease: even in countries where research on eco-efficiency has been most successful. Overall consumption of environmental resources continues to increase. This clearly tells us that increasing improvements in the current system are not enough. The transition towards sustainability requires a systemic change. It is not a question of doing what we already do better. It is a question of doing different things in completely different ways.

There is an emerging demand for sustainable solutions. This includes product and service systems that propose different ways of being and doing from those currently dominant, lighter in environmental terms and more favorable towards new forms of socialization.

2. Recognizing the environment problem is not synonymous with more sustainable choices and behavior. The environment problem has recently come into the political policies of many governments. It appears on the front pages of many newspapers and it is evident in the sensitivity of many citizens. However, contrary to naïve expectations, we see that this leads to an explosion of new problems: international tension, financial crises, social problems, and individual fears.

In particular, when we observe the expectations and behavior of people and communities, experience teaches us that the absence of feasible, socially acceptable, and widely recognized alternatives, leads to an increase in the perception of environmental risk that – in turn – generates dangerous ideas and behavior.

There is an emerging demand for visions of sustainability. This requires scenarios that show feasible, socially acceptable, even attractive, alternatives on different scales for various aspects of people’s lives. It is possible to have food with little chemistry and without transgenic products. We can move without cars. We can feel safe without locking ourselves in gated villages. And so on.

3. The feasible alternatives found so far indicate new qualities. There are few widely recognized feasible alternatives. However, on a closer look, in every country in the world there are cases of social innovation that could be seen as significant steps towards sustainability. This includes short food chains, shared residential services, bottom-up urban improvement initiatives, and examples of sustainable territorial management.

In their diversity, these cases have a fundamental characteristic in common. Each one of them compensates for the reduction in consumption of products with an increase in other qualities. These qualities include the quality of physical and social environment with the rediscovery of commons; the quality of capability with the rediscovery of individual and community know-how; or the quality of time with the rediscovery of slowness. These aspects assume different meanings in different societies and places. Nevertheless, their presence in situations so far away from each other makes us think that they may constitute a first set of sustainable qualities. In other words, it is beginning to emerge that the quality of places, of communities, of time, of common assets in general could be the material on which to build every sustainable alternative to the current unsustainable forms of production and consumption.

A demand is emerging to investigate new qualities: design reflections, proposals, and scenarios that investigate basic questions such as the quality of places, communities, commons and time.

An Open, Collaborative Program

These are a few proposals. They are examples of a direction for our work in changing the change. A vast organized research program should be developed along lines such as these. For this reason we hope to be able to write the Design Research Agenda we mentioned at the beginning of this talk.

This program should be something of a novelty in the way it is conceived and conducted. It could develop a P2P approach, including schools, design firms, and research centers from all over the world. It could be open and collaborative, capable of self-regulation and self-management. It should be a research program with total freedom.

It is easy to think and talk about all this. Can we actually put it into practice?

We must take the positive, critically optimistic approach of the designers we started with, saying, “Yes. We can.” This conference can be a first, significant step.

Changing the Change:

A moment of reflection in a continuum of action

Jorge Frascara[2]

Changing the Change was a working conference. It had a clear aim: to discuss the role of design in moving society toward making human life sustainable. We, however, do not know how to do this. Discussing how to begin to meet this goal was actually the purpose of the conference. The participants' proposals and experience, their ideas and visions, have begun to flesh out the territory of possibilities for responses to the challenges we face.

The task of the conference was to allow the presentation of different visions of how a change toward a sustainable society could be articulated, and the problems we will have to solve in the process. Conference participants were invited to make an effort to understand the different positions to be heard before pronouncing themselves for or against. I proposed the conversation as a model of communication, rather than the debate. The debate is characterized by opposition, and it is centered on winning or losing. The conversation is centered on exchanging and understanding, it admits plurality of views and it ends without winners or losers, but with richer perceptions. In all process of team work, it is by far more efficient to use the conversation as a model to organize the process of working together. Each personal history brought to the table will result in a different perception of the problems we face, the priorities we perceive, and the strategies that could help in the process of changing the change. The same applies for dialogue after the event.

The papers favored different priorities: some speakers proposed that the important problem is the current understanding of design, and the way in which this understanding should change in order to move toward sustainability. Others thought that the solution must center on a change in lifestyle through a process of social innovation; others still viewed the main solution as coming through industrial or technological innovation; while others saw design education as a major place where change could be generated.

The role of the conference was not that of deciding which of these perceptions should be the top priority, but rather, how the variety of perceptions presented, these and others, could be seen as complementary, leading to a richly articulated picture of the taks we face.

The conference was organized by designers and directed at designers. We believe that designers could play a role in changing the change, in re-directing the development of our world. It

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is on the basis of our capacity to envision and design futures that we can affect the real world. Weren't Jules Verne as an author and Flash Gordon as a character highly instrumental in shaping the future, just because they made it visible, and therefore desirable? How can sustainability become desirable? How can it enter the equation of quality, of what designers and clients place at the top of their lists for design excellence?

There are promising initiatives: some international corporations are looking at zero waste, others have increased their allocation to research on alternative sources of energy, and on more efficient ways of generating energy. The City of New York is looking at turning all its taxicabs into hybrid cars. Too little too late? Not at all. Fifty years ago environmental conservation was totally absent from the big corporations and the large cities' agendas. Maybe these are the first steps toward sustainability.

Other interesting things that involve more paradigmatic shifts are happening at the other end of the spectrum, like in the interior of Argentina. Cooperatives are developing interesting production and distribution systems, helping the locals, recovering cultural history, and using zero environmental impact technologies.

Insights discover interstices that allow action in the most unimaginable places. Changing the Change was full of testimonies to this, showing actual, factual experiences of implementing novel design approaches that find opportunities where everybody sees only difficulties, and spaces, however narrow, that permit innovative action. The scale is irrelevant; large or small, every move in the right direction is important.

My own view is that one of the major problems we face will be to generate a value system shift in the population at large – designers and others. I could recognize three major groups in society: government, industry, and people at large. However differently expressed the wishes of each group could be, all three want benefits from whatever change they decide to support. Governments want to be helped to stay in power, industry wants to be helped to make more profit, people want to be helped to have a better life – whatever this could mean. The general question our public will ask to whatever we want to propose, is "What is there for me?" We will have to be able to formulate our moves bearing this in mind: the moral imperative of doing something "for the environment" might not work with the majorities.

The changes proposed could be paradigmatic or gradual. We need to continue to explore and discuss models of intervention.

To sum up some important questions at stake:

• How can a new direction be applied to the way things are, and change our culture into a sustainable one?

• How could design research contribute to this change?

• How could designers put sustainability as a top requirement in their design criteria, affecting the way in which products, systems, services and communications are designed?

• What are the strategies that have been successfully implemented in different contexts to make products, systems and services more sustainable?

• How could we help disseminate successful case histories, that could serve as models to be adapted and followed?

• What could be the role of all design areas in this process?

An important communicational challenge we face is that people can only understand things that relate to things they already understand. We will have to find the links that connect the large issue we face with the varied personal experiences of our public. In the case of designers, possibly the entry point would be a change in the notion of quality in design. As much as in the past design quality was centered on aesthetics and creativity, later on function, and later still on usability and innovation, sustainability should become automatically associated to design quality, moreover, it should be seen as an essential condition for design quality.

I moderated one of the sessions about Ways of living. The discussion at that meeting centered around the following eight areas:

1) Change

Change is to be radical, not gradual. It cannot depart from today's situation toward a better one, instead, it should pursue a vision of sustainable life.

Change must begin in one's back yard. Even at a small scale a change toward a sustainable lifestyle is good. Activism is indispensable.

As a civilization we have moved from myth to mechanics; now we need to consider every aspect of life in an integrated way. We need not only technological but also spiritual change.

2) Language

It is good to look at other languages to see how definitions differ. In Chinese the word for "sustainability" is "harmony," a somehow more holistic understanding of the issue. We can learn from other languages and develop a new vocabulary for design.

3) Knowledge

We have to learn how to share local knowledge. The conference uncovered strategies used by some cultures and ignored by others. We should build ways of sharing knowledge despite geographical distances and disciplinary barriers. Our design research knowledge needs to be interdisciplinary.

4) Culture

We need a better understanding of different cultures. From colonial exploitation now the world has moved to economic exploitation; maybe communication design can help different cultures engage in a mutually positive way.

5) Community

We need to learn from those who still have interconnected communities, and form those kinds of communities. Instead of telling society what to do, designers should become lifelong students of society. There is power and beauty in community development. One example was Richard Braul's presentation of a community garden. Mugendi M'Rithaa's presentation made evident how in his South African culture the sense of community is fundamental in life: the power of the individual comes from the community.

6) Meaningfulness

According to a work cited in the discussions, out of nine generally recognized human "needs" only two were really needs. We have to determine what is really necessary for a meaningful human life.

7) Quality of life

Two things were recognized: personal balance, that is, a sense of personal harmony and contentment; and a sense of community, involving communication, protection, participation, recreation, identity, freedom, and generosity. Slowness was identified as a desirable component, permitting attention to the important things in life.

8) Design

How can we make sustainability attractive? There are possibly two ways: through the development of scenarios and convivial tools, and through community generation and activation.

Changing the Change was a moment of intensity in a continuum of action. Conferences are very charming occasions: they include nice friends, exciting people, interesting presentations, new contacts, and enjoyable social events in unfamiliar friendly places. But if they do not become arrival and departure points for a continuing action, and if, in this case, a change in the current changes is not generated, the effort would not make sense.

These proceedings are a contribution to a constant flow of communication, so that like-minded designers, engaged in changing the change, could broaden their frame of reference and work more in concert. The conference contributed to the necessary drive and the indispensable tools that are needed to develop design research internationally toward a sustainable society. The effort must constantly continue, even though in a non coordinated way, but continue anyway.

As a bottom-up event, the organizers could only aim at creating favorable conditions for things to happen. The conference was not about writing a manifesto for others to implement: it was about action, reporting on action, conceiving action, and taking action. It is easy to write nice things; but it is difficult to integrate new challenges into everyone's agenda, challenges that need imaginative work, sustained effort, often politically and financially creative effort. It is easy to conceive design products in sustainable terms, but it is not easy to implement sustainable design ideas when market, political and economic imperatives come to play.

I believe the move toward a sustainable approach to designing is possible, through the exchange of actual projects, ideas, experiences, visions, and tools. All of us need all of us. The conference served to inform all there about a number of projects that offer insightful models of acting. These proceedings are a permanent source of information. Their objective is not to report on something that has happened, but to provide ideas for something that could, and should happen: changing the change toward a sustainable way of living.

Welcome to research

Role, meanings and welcoming of the Conference in the year of Design in Turin

Claudio Germak[3] (12.7.08)

The fact that Turin was nominated World Design Capital is not a prize. Turin and its regional territory were chosen by ICSID, after hosting the 20th Winter Olympic Games, as a "pilot city", with the task the investigate, implement, and promote Design.
Design as a "flexible" activity, able to generate resources, make different kinds of knowledge interact, interpret the humanistic and technological innovation, grasp the meaning of the change, anticipating it sometimes. Torino 2008 WDC, the institutions and their partners worked hard on the concept of Design "flexibility" (flexibility was the slogan for the year of design) by promoting several initiatives with different topics and audiences, involving a number of actors from the wide, by now, Design System, transferring local values to the international scenario and hosting international experiences and the debate resulting from them, in the meantime.
The scheduled activities for the third period of the year, dealing with TRAINING in Design field, focused on this objective. The Politecnico di Torino and its emerging Design area, according to its role as hosting university, but sharing this duty with other training centres, first of all, the Politecnico di Milano, took care of the organisation of some important events, accessible for the international community, whose purpose was to explore international scenarios regarding sustainability and which were developed in order to create positive results, this was the ambition…, locally and for the whole system, in terms of visions, proposals and tools.
The hint was taken by "Changing the change. Design visions, proposals and *tools"* (Turin, July 10,11,12), an International Conference on the role of Design towards sustainability that saw the lively participation of over 350 renewed researchers and speakers from 27 world countries. With its 150 scientific papers, it represented the test focus on approach attitudes and modes regarding the more and more cross-dimensional and pressing topic represented by sustainability in everyday life, production and design systems.
After this*, "Designing connected places"* (Pollenzo, July 13/29), scheduled as part of the eight main events for Torino 2008 WDC became an international summer school open to international Design students from the best Design schools in the world. Led by international experts and with the participation of Boards, Institutions and Research Centres as Local Commissioners, 250 youngsters worked for a week on extremely contemporary and internationally interesting projects, giving proper solutions (this was the brief) for the local contexts:

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health and well-being, food and new food networks, urban mobility, safety and liveability in cities, new production systems, forms to represent how complex the territory and communities are. Plus, a design study in Turin to project a parametric temporary structure suggested from the connections with the problems discussed in Pollenzo.
Two events that were developed in close synergy – where the first one, the Conference, was conceived as an ideal place for *"ideas for changing the change "* and the second, the Summer School, was considered the project application for *"designing the change"*.
Two highly successful events, mainly due to word-to-mouth advertising and to the Net and the many web sites and blogs that turned it into a real topic of discussion, rather than, we must reckon, for the national press.
Anyway, these events strengthened the image of Turin, the institution which had supported them and the team composed by Torino 2008 WDC and the Polytechnics of Turin and Milan, that outlined not just their scientific contents but their structures as well, from a macro-scale to a micro-scale point of view, according to an original and conscious eco-design approach: *from the elimination of green-house gases during the designing stage (AzzeroCO2 program) to the proposed sustainable mobility; from the places were the works took place, prestigious evidence of architectural and landscape local culture (Valentino Castle, Lingotto plant, The Faculty of Biotechnologies, Pollenzo mansion) to the use of environmental-friendly equipment and materials; and finally, the catering service – a chance to educate people to consume typical products coming from short food production chain.*
Then the positive results and the basis for the future of these activities:
The *Changing the Change* Conference started up a *Design research agenda for sustainability* on its own Web site as a reference point for trends on this topic, so offering the International Design System community a virtual discussion table and real chances to meet people in order to allow the presence of a number of different opinions: if nowadays the main actor of the Conference is the academic research, tomorrow this may be the production system (the companies), the project system (designers), service design system. Seul, the next World Design Capital, is already being contacted for this reason.
The international Conference was organised according to sustainability, both in terms of eco-efficiency, for what we could do, and also talking about sharing spirit and quality of the accommodation and welfare provided.
Summing up the situation of research in terms of sustainability and acting as a structure model for discussion and international confrontation (but even for physical meetings, which is always important) about these topics: these were the two main goals of the Conference.
AzzeroCO2 – The preliminary phase of the Conference was designed taking into consideration the possibility to eliminate the green-house gases resulting from energy and materials consumption and due to transports and staff activities. This action was not solving the problem, but represented a sign to give a specific direction to our behaviours and those of the people who were organizing a conference or an event in Turin in those days. The initiative was led by AzzeroCO2, a society created in conjunction by Legambiente, Ambiente Italia and Kyoto Club. The selected "care" intervention regarded Piedmont local area: in specific, we invested on the reforestation of Po river park, thus restoring the indigenous flora and fauna that our river is gradually losing. Thanks to this intervention 35 tons of CO2 will be eliminated, as much as the CO2 consumed at the preliminary stage of the conference.
The locations – For humans, sustainability largely depends on the quality of the environment, the environmental - friendly one (zero impact) and the one related to the comfort and the cultural meaning of the space where people live. Therefore, we liked considering the Conference locations as a small stage where the city's urban transformations are taking place. We selected 3 locations telling about next present/future, recent past and ancient past of Turin.
The Institute of Biotechnologies – In the next future Turin will gradually take the aspect of a post industrial city, with activities regarding advanced technological research (seven scientific/technological parks are located in Piedmont). It will also be a city hosting high level museums, a urban setting for cinema movies and a taste workshop for food. The Institute of Biotechnologies, the place where works took place, is a prestigious technological research centre, located in a new and architecturally refined building. A sustainable building, in its own way, with hard skin (armed concrete) and tender heart (internal gardens). A compact building, protected and open towards the city at the same time: just a huge glass is separating it from the chaotic streets of this multiethnic district. I was about to forget mentioning that Turin will not just be a post-industrial

city in the future, but also a multi-ethnic one.

Valentino Castle – Location of the Conference Dinner. The people from the Turin University Design scene are bound to this place as a kid is bound to his first bed. The Faculty of Architecture has been located here for one hundred years, and the Faculty of Design research for the last ten years, by now. Before giving it back to the city that deserves this place to turn it into a museum, we just wanted to let our friends get the touching chance to spend a night in a impressive and very "savoy" place. Around the big (self-made) table shaped as an arrow as the CtC symbol, there were the 350 participants and many other institutional (but not only) guests.

It was not a gala evening but an occasion to share the pleasure of being together, with "Piedmontese jazz" and typical foods selected from the Basket of products of Turin Province, a very successful initiative testing the sustainable way of short production chain and typical food product.

Lingotto – architectural complex, symbol of modernism, first industrial FIAT automotive plant and now combining a shopping mall and a leisure and multicultural centre. Many of our guests stayed at Lingotto, precisely at its Camplus, as the university residence is now called. A university residence where you can actually breath "a sustainable air". This facility is respectful of its past and even if it was restored according to contemporary needs, this was done without upsetting the old order. Unlike the past, now it is a very bright place – the courtyards are rich in vegetation and there was a great deal of attention in preserving the old characteristics of the plant, whose main structural characteristics still recall its original function. The visible structures of armed concrete and the colours are just like they used to be: white walls and grey wainscots, including also doors and windows and rooms' furnishing. The enamel painted wainscots, purely functional in the past, is now turned into a string running through a new tale, where beds, tables, sofas come to the surface as they were peninsulas. I may think that the sustainability community noticed these aspects, which are not just simple details, secondary things. On the contrary, these signs are peculiar characteristics of the place, with a touch of novelty in comparison with the past – for instance: the orange coloured lunge, the new presence of wood and floor materials. Architect Renzo Piano, responsible for the restoration, said, when the works began (1985), he wanted to re-create in Lingotto "an original piece of the town".

Special occasions: free city transports, guided tours and 20 free bicycles for the participants to let them find out about the wonderful paths along the river Po.

A bicycle is the best means of transport to discover an unexpected Turin, a city on water, for example, with four rivers crossing it and natural parks.

As you may have understood, our will was to grant the participants a stay which was focused on sustainable design and international community: from the selected conference locations to the coordinate image of communication, mobility, sustainable food and locations themselves. Accommodation, services, and leisure time were set according to community spirit and values sharing.

Who are we?

An overview of the conference results

Carla Cipolla[4]

Numbers in Changing the Change

The conference “Changing the Change” was an invitation to build up a panorama of design research results today. Looking at the abstracts and papers after the conference, it is possible to affirm - that this invitation received a wide response. Firstly this is true , considering the geographicaldistribution of countries with approved abstracts.There were 27 - from South and North America, through Europe, Africa and Asia.

The abstracts approved were 163: 101 from the United Kingdom, Ireland, Belgium, Portugal, Germany, France, Italy, Norway, the Netherlands, Sweden, Switzerland, Finland and Denmark; 4 from Israel and Turkey; 5 from Kenya, Botswana and South Africa; 13 from China, India, Japan and South Korea; 18 from Brazil and Colombia; 13 from Canada and the United States; and 9 from Australia.

Clearly Europe, particularly Italy, sent the largest number of abstracts. This is explained by the fact that the conference took place in Turin. But if we exclude Italy, we arrive at a very balanced distribution between Europe and the other countries: 50 abstracts from the United Kingdom, Belgium, Germany, the Netherlands, Finland, France, Portugal, Denmark, Ireland, Norway, Sweden and Switzerland; and 62 from all the other countries. In synthesis, 1/3 fromItaly, 1/3 from Europe and 1/3 from the rest of the world.

It is also Interesting that a country like Brazil, which has only one PhD School in Design, had 17 abstracts approved, the total representation from Latin America (with the exception of Colombia, which sent only one abstract). After the United Kingdom, with 26 abstracts approved, Brazil was the country (still excluding Italy) with the largest participation in Changing the Change.

Other numbers: 348 documents were uploaded as papers/visualizations in the conference web platform of which, 263 were sent to 40 reviewers, resulting in 163 approved abstracts and 138 final papers.

But interest in the conference themes is not restricted to these numbers: the Changing the Change newsletter was sent to more than 1300 subscribers.

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Photographing design research

As far as content is concerned, the scientific committee sorted the papers into 6 groups, around the wider conference areas of visions, proposals and tools as follows: Visions: ways of living and producing. Proposals: daily life solutions and enabling systems. Tools: design theories and methods.

On reading these papers, a still unexplored richness of possible clusters, sub themes, and even possible collaborations emerges.

In the following lines we will modestly attempt to outline one panorama of what Changing the Change hasbrought to light. This is just one possible interpretation and makes no claims to be exhaustive.Each paper could be classified in different ways and into different clusters. The intention is mainly to contribute to further discussions and facilitate potential follow up activities.

Considering that "sustainability must be the meta-objective of every possible design research activity" - as appropriately stated by the conference scientific coordinator – the clusters/themes below describe some ways in which design researchers' are *moving towards it* (or how it is coming towards them).

[Please note that all papers in these proceedings are referred to by a code: P(+number) as used in the next paragraphs.]

Cluster 01:

Local development, locally-based approaches.

It's possible to find at least 15 papers based on locally-based approaches, particularly papers from China: the majority of the papers approved from this country consider this dimension. It includes issues such as the preservation of local memory (P05, P11) or the design/architecture discipline's attempts to face up to changes in urban communities or spaces (P06, P09). But the tension between urban development and historical areas and their communities is also faced by authors in Istanbul (P08).

The question of tradition and local identity is also taken up by some European papers, also when trying to go beyond "localism" (P10), or looking at the relation between fashion and its territory (P43). A focus on landscape and urban scenery was not forgotten (P12), as well as possible ways of connecting a town (or a city) and its rural surroundings (P07).

Other papers focus on fostering or observing urban/local creativity in Europe (P4, P20), and China (P109).

This "locally based" cluster includes a knowledge based systemic approach (P22), a social network application (P88) and a new urban vision (P03) targeted to enable a "strategic" conversation between local stakeholders towards sustainable development.

Cluster 02:

Housing. Neighbourhood life.

There are at least 6 papers specifically dealing with questions relating to new visions and solutions for these two themes. New ways of living neighbourhood life (P19, P53). An intelligent management of housing resources, both enabled by technology - in a "smart home" (P66) – and by shared resources and services (P19, P54). A nomadic lifestyle was not excluded (P62), and a vision of eco-cybernetic architecture (P23) is proposed.

Cluster 03:

Consumption patterns.
User-consumers actions and behavioural changes.

A group of 11 papers focus on how to influence user-consumer behaviour in a sustainable way, i.e., how to persuade him/her to act accordingto certain criteria, or vice-versa, how design can learn from virtuous consumption attitudes (for example: P13, P15, P17, P50, P57, P59, P67, P69, P113, P129, P136).

Cluster 04:

"Emerging" countries.

At least 15 papers dealt with questions directly relating to what are usually called "emerging countries", among which 3 papers presenting visions (P1, P18, P28) and 8 proposing specific development strategies (P24, P25, P27, P31, P32, P60, P90, P93). Of the remaining 4 papers, 2 are analytical (P21, P26), another proposes a solution (P61) and the fourth one looks at design education and research (P87).

Approximately half of the papers were proposed by - or included - "outsiders", i.e., authors from the so called "developed countries" (ex. P01, P21, P24, P26, P27, P32, P61, P93).

Through the papers proposed by African authors, the focus is placed in how design can support small producers (P31) or consolidate its home-grown ideas (P90). Leapfrogging (P25) into sustainability is also considered. Brazilian authors propose three papers, particularly embedded in their cultural or environmental context (P18, P28, P60).

Cluster 05:

Product design strategies. Artisanship.

At least 11 papers deal directly with questions related to product design, divided into different strategies to achieve sustainable results on the one hand (P04, P33, P4, P68, P121), and approaches related to artisanship resources and empowerment (P41, P42, P44, P45). From the 4 artisanship approach papers, 2 come from India, the other 2 from Brazil and Italy. It is possible also to find papers facing product design issues, particularly focusing on changes in consumer behaviour (ex. P69, P129)

Cluster 06:

Production systems. Product development processes.

At least 7 papers can be classified under this cluster. Production systems are basically divided into recycling processes (P35, P36, P38), a vision of a larger cyclical production process (P33) and a systemic design approach (P40, P120). Other 3 papers propose sustainable product development processes (P39, P65).

Cluster 07:

Food.

3 papers can be found under this cluster, facing sustainable food communities (P46), how to have a fast "good" food (P47) and novel forms of intermediation and communication (P48).

Cluster 08:

Mobility.

3 papers are directly related to this issue, two of them are mobility system (P49, P51) and the other one is specifically related to attitudes and behavioural changes in users (P50).

Cluster 09:

Energy.

The 3 papers classified under this cluster are based also on a reflection about the role of design. One in creating a new paradigm for new solar heat and power systems (P75) and the other in making industrial energy needs more sustainable (P76). The third one does not deal only with energy questions, but it has been included as a model for responsible design practice (P77).

Cluster 10:

Packaging.

2 papers can be classified under this cluster: one describes the challenges for design in the Australian packaging industry (P78) and the other indicates how a sustainable packaging solution does not reduce the industry's efficiency (P79).

Cluster 11:

Tourism.

2 papers concern tourism activities. One introduces an existing community based tourism initiative, proposing a reflection on the role of design in promoting and sustaining such initiatives (P70). The other one proposes a solution to avoid the "harmful" effects of tourism, enabling tourists to visit places and communities that do not have the facilities of urban contexts (P71).

Cluster 12:

Social innovations.

Social-based approaches. At least 10 papers explicitly enounced the word "social", *in its different connotations.* Seven papers show how design can empower social innovation processes (P01, P52, P56, P70, P97, P89, P81). The design role in promoting social business (P80), the definition of what is called "social design" (P105) and design research approaches applied to complex humanitarian issues (P117)are also considered.

Cluster 13:

ICT based solutions.

Al least 8 papers can be classified under this cluster. It includes mobile communication tools (P56), but the main focus is on web tools: for design activities (P82, P86); for didactic purposes (P98, P99); for empowering social innovation (P89) and a SocialDesignSite (P105). A social network application for local development (P88) is also proposed.

Cluster 14:

Networks.

7 papers focus on networking activities: design networks (P27, P82, P86, P98, P105), a social network application (P88) and a virtual institute (P89).

Cluster 15:

Specific technology-based approaches and solutions.

At least 2 papers can be found. One using RFID as a platform (P120) and other using ETC to promote sustainable mobility (P51).

Cluster 16:

Mapping.

4 papers can be classified under this cluster: cartographies (P72), diagrams and complex systems (P73, P74) and a design research map (P85).

Cluster 17:

Design per se.

A large number of papers are concerned with what here we are calling “design per se”, i.e., designers and design researchers reflecting on their own practices, developing specific tools and elaborating theories. It includes as examples:

- enabling tools for design practices (P55, P83, P84, P91, P111, P112, P114, P135);
- specific approaches to design practices (P104, P106, P107, P109, P133, P132, P134), including inter-transdisciplinary ones (P116, P118, P119, P127);
- design networks (mentioned before in the paragraph “networks”);
- design education/education through design (P87, P92, P94, P95, P96, P97, P98, P99, P100, P102, P103)

What’s next?

The conference organizers have always considered the Changing the Change conference not as the "final result" of a process but as a starting point. Therefore, we hope that these "proceedings", the conference results and the DRAS – Design Research Agenda for Sustainabiliy can also be considered as work material, favouring fruitful post-conference activities and contacts.

Debates

Some issues emerged on the Changing the Change newsletters

Pier Paolo Peruccio[5]

Sustainability has to be the meta-objective of all design research. Every complex project needs to be based on a solid design study, i.e. an activity that produces responsible transferable knowledge for the purpose of achieving tangible sustainable results. This was the clear and universal message of the three-day conference in Turin. In-depth discussions were held on the role of designers in contemporary society, with special attention given to the possibility of designers becoming the "curators" of the transition toward a society of networks, information and sustainability.

"Changing the Change" positioned itself at the crossroads of two vast disciplines (design and sustainability): to explore the role and potentialities of design research as it changes its orientation towards sustainability, reawakening the interest in a scientific community that has gone beyond the 'secured' turf of design. Certain crucial issues emerged regarding the prospects of sustainability, from the local potentialities of South America and Africa as well as China and India – without mentioning, for obvious reasons, the countries that have traditionally dealt with, and continue to deal with, design *latu sensu*. These potentialities can converge into design research in the next few years.

Among the participants invited to ponder the issues addressed by the conference, the names of John Thackara and Bill Moggridge (the CEO of IDEO) stand out, as did Josephine Green of Philips Design who represented the business community. Ideas about design theory and research were voiced by Victor Margolin and Nigel Cross.

The task of current-day designers discussed at the conference is to be found somewhere between design and social issues, and it includes, among many other things, intelligent mobility, output and input of industrial systems, food that is *Good, Clean and Right* (the title of the book written by the founder of Slow Food, Carlo Petrini), self-organization and new ways of living on and taking from the earth in sustainable terms.

This approach to design looks at people and geographic settings, tradition and the circulation of information, the use and enjoyment of goods as more vital than the possession of goods, social factors as more essential than economic or aesthetic ones, relationships as a priority over products, collectivity and cultural growth over individuals and analyzing the GDP, *social design* over industrial design.

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Social design was the focus of the conference, starting with a discussion about its meaning in the newsletters of CtC which preceded the event. The definition of social design given by Victor Margolin is "*Design aimed specifically at improving the quality of life. It is accountable to social results and not simply successful market exchange*" (***Social design/debate/1 newsletter)***. According to Josephine Green: "*Design on its own is too broad and can be too easily co-opted by the old. Industrial Design reflects the past not the future. By putting social before design, things change, things open up. Social Design offers vistas of social change and transformation and emphasizes its relevancy and meaningfulness for the 21st century. Put simply, a broader meaning to social innovation/sustainability equals and is complemented by the broader meaning of social design. A design for the next era*" (***Social design/debate/2 newsletter***). In the opinion of Ezio Manzini "*One of them is a design with an explicit social agenda: a new design field where some designers specialize in collaborating with social workers to solve specific, acute social problems. The other one is more general and refers to the whole design community. In the latter, all designers, whatever their specialization happens to be, must redefine their aims and re-orient them towards new emerging social demands. Though both these actions are important, for me, the biggest challenge today involves the latter definition of design: to develop knowledge that is needed to improve the welfare of the whole society, as we move towards sustainability*"(***Social design/debate/3 newsletter***).

Sustainability is available to everyone because it already exists in many places in the form of extensive planning.

All of us together are the designers and stewards of our future. Sustainability is earned in daily life by making changes, even to the small things in our way of living and partaking of the earth, using energy resources more efficiently without necessarily jettisoning them, moving away from systems that devour energy and starting to use the potentialities offered by the information society more efficaciously.

In the new Italian edition of his book *In the Bubble*, Thackara writes "Sustainability is about a world based on less stuff, and more people. Sustainability therefore means putting people back into control of situations rather than replacing them with technology."[6] The United Nations demographers tell us that the world population, now standing at 6.6 billion, will reach 8 billion in 2025, and 9.2 billion in 2050.[7] This increase, generally described with great alarm in contemporary literature which focuses on the relationship between development and the environment, is in Thackara's view a form of "social capital", as Jane Jacobs would say.

Perhaps we are at a turning point: the vast tangle of planning networks that make up our society is more insistently calling out for an expert professional figure who can guide the transformation processes toward sustainability. Many virtuous cycles are already under way. We are seeing actions being made to overcome various entrenched local customs. These creative and entrepreneurial energies can be networked and shared with the entire community, whether they are proposals, sometimes even naïve ones, for an alternative mobility in villages with few inhabitants, or other actions having a thunderous media impact like the bottom-up distribution system suggested by Jeremy Rifkin, the so-called "Third Industrial Revolution" in which each citizen produces for them self their own renewable energy and shares it through "intelligent networks", much like the Internet.

It is a well known fact that every day designers design products, services and communication. They can really affect the behaviors of people, no longer just "in their own small way", regarding everything in the sphere of using and consuming material and immaterial assets. Sometimes this has minimal effects (positive or negative), but other times it has a domino effect on social systems. From Shanghai to Belo Horizonte, came one of the certainties offered by the conference, where many schools of design have become promoters of specialized training to prepare professionals who can give use expert advice and orient this change in the right direction.

[6] Cf. p. 13 of J. Thackara, *In the bubble. Design per un futuro sostenibile*, Allemandi, Turin 2008.
[7] *World Population Prospects: The 2006 Revision. Highlights*, United Nations, 2007.

Visualizations to Change the Change

Emerging issues from Visualizations Exhibition

Walter Mattana[8], Francesca Piredda[9]

Design research is looking for its own ways of communicating. This was one of the main purposes of Changing the Change Conference, looking for new models for building relationships and engaging conversations. Visualizations Exhibition gave some evidence of that and its proper results: interesting creative solutions and also criticalities in terms of languages and formulas available for communicating.

Starting from this kind of experience, the paper will go back along the work made for the Exhibition, telling the backstage and the main characteristics emerged from the show (Visualizations overview). The Exhibition itself will be analysed as a way of communicating and socializing design research results: did it work? How can we improve it? Which are the issues emerging from this kind of experience? How does communication design deal with and how can it contribute to the Design Research Agenda for Sustainability emerged from the Changing the Change Conference? This paper would like to promote the dialogue about the role of communication design *in* and *about* design research.

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1. Introduction: purposes

How does Design Research communicate itself? We think that design research has the responsibility to spread knowledge and make it diffuse, as popular as it can. Communicating means telling stories, sharing knowledge, building new aesthetics for complexity and making theoretical issues tangible and comprehensible problems.

Visualizations Exhibition wants to offer the opportunity to look at design research as a communicative process with different audiences: users, peers, companies and institutions. Changing the Change keeps on looking for new ways of expression and dialogue.

We started from the scientific community and asked ourselves: how can we talk each other? The Exhibition at Changing the Change Conference was intended as a step towards the building of a peer to peer communication strategy. We collected desgin research material as visualizations and we showed it as a parallel event during the conference, in order to start a discussion about possible ways for shaping design knowledge.

The aim is to promote the idea that design research should also be a process leading to high communicative results. Looking at the final Visualizations, we can say that in many cases it can effectively be. It represents an urgent challenge to face, in order to widespread design knowledge and its culture for a sustainable innovation.

In the era of bottom-up contents and diffuse creativity the ability of image production is widespread. Is there a designerly way of communicating? Could we identify a common ground? Are there different genres for different kind of design research?

2. What we did

Visualizations Exhibition at Changing the Change Conference was a loop of video projections showing participants' research results. We asked authors highly communicative artifacts as animated storyboards (animatic) or short sequences of images and pictures (slideshow).

We think that video (even a slideshow) can help to represent complexity. Is that true for design research?

As we said in the submission guidelines, Visualizations should not be traditional scientific posters or diagrams: we asked to send us short sequences of images (each of them should not exceed 35 secs) conceived as a self standing presentation of visions, proposals and tools.

We received 30 Visualizations of the selected papers. 18 where video files, 12 were folders of images that we edited in a sequence, in order to uniform all the material. Some of them exceeded the requested duration. Others have been extended during the editing in order to have enough time to read the texts in the slides and to make contents much clearer.

We think that the brief format requested (35 secs) is an useful exercise of communication, eventhough that means sacrificing depth for clarity and effectiveness.

Preparing the Exhibit at Changing the Change, on one hand, we applied the same clusters of the papers: visions of possible worlds, research results as solutions proposals, or tools to enhance them. Visions, proposals and tools are the main themes of final Visualizations. Most of Visualizations are proposals and visions. We dedicated one monitor to each theme, in order to better appreciate the contents and the different styles for communicating them.

We didn't give authors any guidelines about the design of Visualizations: layouts, graphic elements or norms, and so on. In fact, in respect of contents, we preferred giving them the freedom of making sense producing a sequence of pictures, choosing their own layout and contents organization.

Let’s briefly analyze final Visualizations. We’ll do that without referring to contents. In fact, contents quality was the focus of the papers selection by the blind peer review committee. Our point of view looks at presentation methods and cognitive styles.

We can identify different genres and languages for communicating design research, different styles of Visualizations that mostly reflect some typical processes of design research: ethnographic documentation, photo and collage, info-graphics and maps, Power Point style. Of course, we can also find hybrid rhetoric and languages.

Typographic style also emerges as an interesting language for building relations between nodes of contents. 3D interfaces, finally, is a metaphor for the space of the community and the content sharing.

3. Visualizations at Changing the Change Conference: an overview

Communicating a project or a research is never an easy task, even if it must be made through an audiovisual presentation. In this case, in fact, tools and skills that we usually use (texts, photographies, illustrations, diagrams, maps) must be translated and recombined into a new linguistic dimension. What’s more, it is a very complex dimension, even more complex than we can imagine: space and time assume particular values; the language of images is regulated by a specific grammar; rhetorics are constructed by metaphors and metonymies.

Whenever an illustration, a photography or a diagram are inserted into a film they immediately forgive their autonomy and change matter. In other words, they are no more simply photographies or diagrams, but they become shots (or part of a shot): narrative and temporal units that live according to the relations that they set up with the other shots in the sequence. In the same way, when text takes part of an audiovisual artifact, it necessarily splits in two separated forms: the one which is exclusively oral (voice over and dialogues), and the sign (titles, captions, intertitles).

Producing an audiovisual artifact - and it is always true, from films to visualizations - means that you should be able to manage simultaneously a series of heterogenous elements (fixed and animated images, sounds, words, time and space) through a narrative process made by continuous selections and combinations. This kind of process is not always easy to assimilate, just because it is very different, by nature and history, from the traditional models of scientific communication.

Fellow researchers, as well as students, often ask us whether there is a sort of linguistic formula for producing an audiovisual artifact, or a conceivable model that applies universally. The answer is no. The audiovisual code is more similar to the open structure of a *langage* rather the closed, conventional an hierarchical structure of a real *langue*, as Christian Metz (1968) noted in his semiological studies on films. Please note that, in order to avoid misunderstandings, we keep in French the words *langage* and *langue*, according to the distinction made by Ferdinand de Saussure. In structuralist linguistic *langage* is a system of signs, non-verbal too, that combines a concept (*signification*) to an acoustic image (*signifier*), for example: the language of flowers. While *langue* is a conventional and abstract code with a grammatical structure, for example: the English language. In the audiovisual forms, as far as *language* is concerned, the connection between content and its expression is very high, they are inseparable, and they always determine each other. Moreover, from a linguistic point of view, a shot is not comparable to a word. It is not the minimal unit of a code, which exists independently from the use that you can make of it, but it is a complex proposition that must be “written” again and again. Unlike a word, a shot is a *unicum* made with a specific purposewithin a wide communicative context (film, video, commercial, etc.).

Quoting P. P. Pasolini (1972), the word "tree" (the abstraction of a tree) does not exist in a film. In a film there is the image of a real tree (a sign of the reality).

Of course, audiovisual syntax exists, but it can not be contained within rigidly coded convention or formula. Its plastic and polymorphic structure does not allow that, because it contains a virtually infinite number of joints and combinations.

Filmic grammars establish general rules for a correct management of the sequence and the editing; studies on narratology and storytelling teach to organize a story or a plot; technical standards define exactly which are the useful operating parameters.

All this kind of knowledge and skills are necessary, but they can solve just one part of the entire problem. The final outcome, its clarity and incisiveness, is a matter of author's expressive and creative skills. His ability to build his own personal visual syntax. Besides, the lack of a syntax is exactly the element that separates professional and disciplinary practices from non-professional ones, as emerging from the studies on home movies by Roger Odin (1995). In fact, home movies have different and more limited communication purposes. An amateur movie does not pose the purpose of getting a specific style of language. It comes from a personal and affective need and it is addressed to a small and known public. In contrast, visualizations must present a defined and expressive language that can enter into relationship with a wider and varied audience.

In these terms the best way to get and improve knowledge of the visual language is observing and inquiring directly the audiovisual texts around us in order to understand the mechanisms that regulate them; without marking the bounds of our proper discipline, but expanding it and looking at all the visual world that is talking to us since the last century, telling stories at several levels about the complexity of the contemporary age. We believe that this could be a good way for us, as designers and researchers, for writing *by* images and not just writing *through* images.

From this point of view visualizations at Changing the Change Conference represented an useful test ground for verifying how does scientific community spread research results, both the positive and the critical aspects.

First of all, as we already pointed out in the second paragraph, we can identify five main styles of visualizations: ethnographic documentation, photography, illustration, info-graphic, Power Point style.

These categories and their several hybrid solutions supply a key for our analysis. We can find each style in all the thematic areas (Visions, Proposals and Tools), but we can say that the Power Point approach is the most dominant. For a detailed comment on this specific topic, please refer to the next paragraph.

We can also find two examples which deal much more with the typographical and the 3D world. The first one is the one by Scagnetti (*Integration through communication tools*): she proposed a video made by the typographical processing, where framing, rhythm and assembly spring from the dynamic composition of texts and key words. The second one is by Walden (*Medium Mash-Up Tool*): the use of three-dimensional graphic is the distinguishing mark of his visualization (even if it wasn't the only case of 3D).

Another example is the one by Xinxin Ma (*The Twig and the Wall*): it's a sequence of photographies that creates a time lapse effect. It is a language, metaphorical rather than narrative, that closely refers to videoart.

Only one visualization used a real video take. Lynda Grose (*Fashion That Helps Us Flourish*) proposed a single long shot of a girl knitting; an image that in some way strikes for the strongly amateur character that bring it near to the etnographic approach. All the other authors are faithful to more customary visual forms like photography, drawing or graphics, and this is probably the effect of an insufficient familiarity, or at least of inhibition, with video and editing techniques.

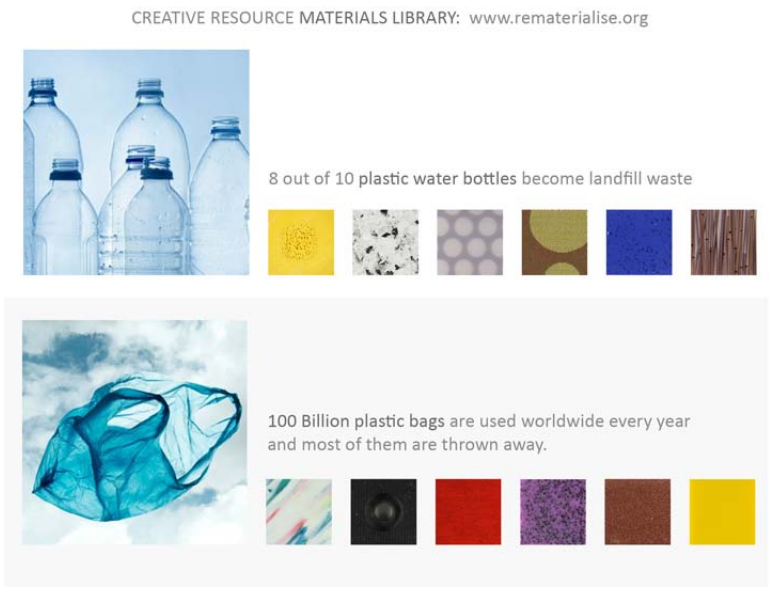


Fig. 1: Jakki Dehn, *Supporting Communities: Design led collaborations exploring the creative and economic potential of materials made from waste*, Visions – Ways of producing.

Fig. 2: Lara Penin and Francois Jegou, *Creative Communities Sustainable Lifestyles*, Visions - Ways of living.

Info-graphics characterize the works by Arquilla (*Dac Link*), Castelli (*Design Directory Italia*) and Quaggiotto (*Knowledge Cartographies*). The cartographies of the last one are not metaphors but examples of real semantic and relational maps. The others are characterized by a quite similar graphical style, speed and dynamism. On one hand *Dac Link* arranges different types of animation mainly based on diagrams and typographical compositions; on the other hand, *Directory Design Italia* entrustes the representation to the metaphor of the map explored by a mobile point of view, identifying the attraction elements of the Italian design research.

The use of photography and illustrations is referable to two big trends. The first one is the slideshow treatment, which is a sequence of images according to a logical or narrative order with key words, titles or voice over.

For example, this kind of visualization belongs to the works by Mendoza (*UFOs Unidentified Future Object*), Lutz Barbosa (*Technoforest*), Morra/Vitolo (*A Narrative Metaphor*), Gamman (*Less is More - Design Against Crime*), Brass Bowden (*HiRise Garden*), Stairs (*Designers without a Border*).

The second one refers to a different treatment of photographic image or illustration. In some cases it belongs to the etnographic genre. In particular, visualizations by Franqueira (*What a wonderful world*) and Ferri/Conditi (*Italian co-housing experience*) use collage technique and photographic overlap for showing and emphasizing the possible renewal of a habitat and the new relations that can be established. We can find the overlap of images, drawings and shapes in other works too and it identifies a visual common style, useful for inserting objects and products into different contexts.

The three visualizations edited by François Jégou (also dealing with the etnographic group) stand out not just for the treatment of the images, but also for the attempt at building brief narrations based on the experience of real people.

At last, according to the critical elements emerged from the visualizations, we can identify three main issues to face: narration, the management of space and the management of time. Those elements occurred, at different levels, in all the visualizations presented at Changing the Change.

The first topic is probably the most difficult to face. Most of visualizations have a narrative structure that is not detached from the tipical presentation practices. Some of them, not many in all truth, entrusted to the logic of metaphor, therefore the topic of narration is still perceived as a specific issue of some disciplines or fields like literature and cinema, instead of a way of improving the comunicative potentialities of a project or a research.

Talking about the other two topics, the management of space and time, authors mostly have difficult adapting the elements of the research or the project into the bonds proposed for the audiovisual artifacts: the PAL format (720 x 576 pixels) and the duration limit (35 seconds).

In fact, generally all graphic (diagrams, maps, illustrations) and textual objects (titles, key words) are designed for a larger size with a higher resolution, but when we take them inside the video format they usually become very small, therefore difficult to read, especially if the scheme is too much detailed. What's more, we have to pay attention to the duration of the images, that means the temporal component of a shot.

Every picture needs a time for reading, a time that is proportional to the scale and to the composition of the image itself. Too complex illustrations or diagrams, showing too many data or very extensive captions, require long observation to get clear and complete information. For this reasons, visualizations, just like all short formats of communication, found their effectiveness on syntesis, on the economy of signs. It doesn't mean sacrificing contents, but knowing how proportioning and distributing their value.

This double problem can be solved in many ways. From a graphic point of view you can make diagrams and drawings, as well as texts, looking more simple than the original ones. If it is not possible, you can show them in detail or scrolling over them according to the definition of a reading path. From a temporal point of view we cannot apply to definitive rules from the editing practice: rhythm and readability remain fundamental problems for communication design. In other words, we have to make a selection of the materials available in the research, in order to include the most significant and important, without claiming to be totally exhaustive.

Visualizations don't have the task of replacing the traditional form of scientific communication, but are valuable tools for complementing and amplifying its spreading, enriching it with a new dimension.

4. What happened: how did the Exhibition work

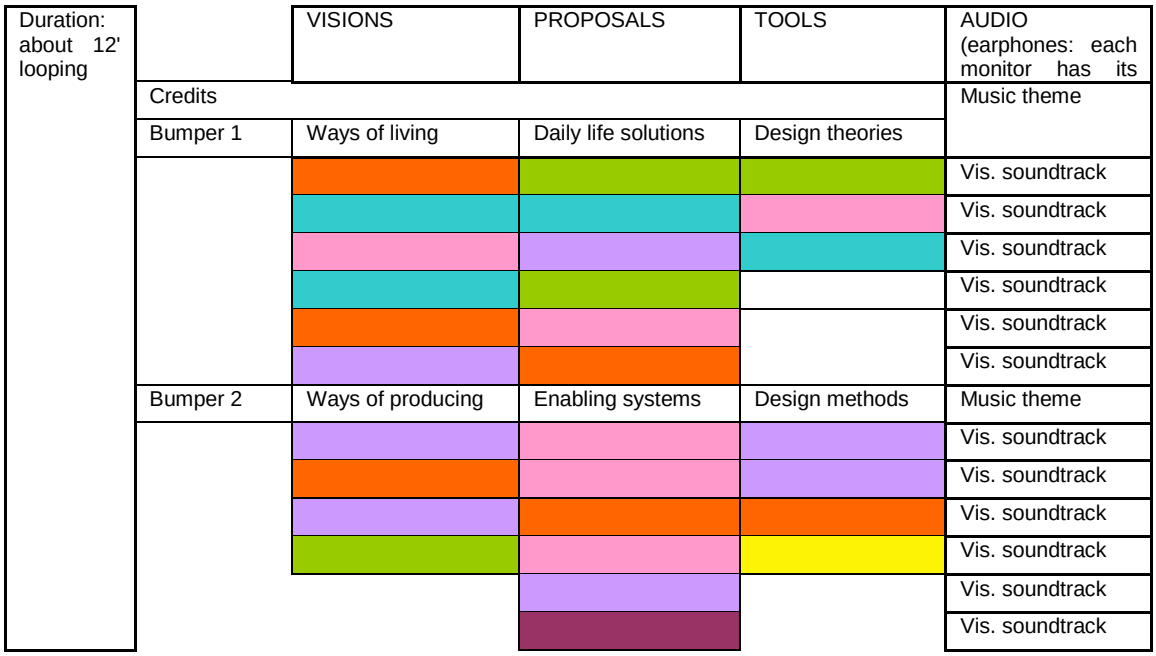
Visions, proposals and tools are the main themes of final Visualizations. We dedicated one monitor to each theme, in order to better appreciate the contents and the different styles for

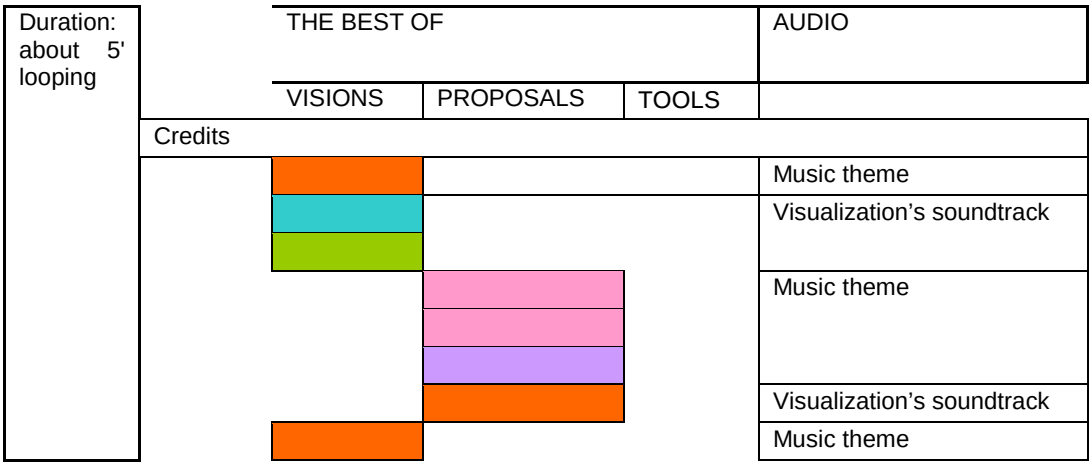
communicating them. The Exhibit allowed getting a wide and complete look at the themes presented, stimulating the dialogue on urgent issues.

We edited the sequences by the genre of Visualizations, trying to underline the variedness and to improve the rhythm of their order.

The big monitor was dedicated to a sort of “The Best of” projection. We selected 8 Visualizations according to two main criteria: the ones which are much more understandable telling research processes and results and the most effective ones from the communication’s point of view.

Some Visualizations have the author’s voice over images, so that we provided earphones for listening. The music theme by Mattia Amadori filled the exhibit area and the space beyond, calling for people to go there and have a look.





GENRES	
	Ethnographic documentation
	Photo and collage
	Illustration
	Info-graphics
	PPT style
	Typo-graphics
	3D

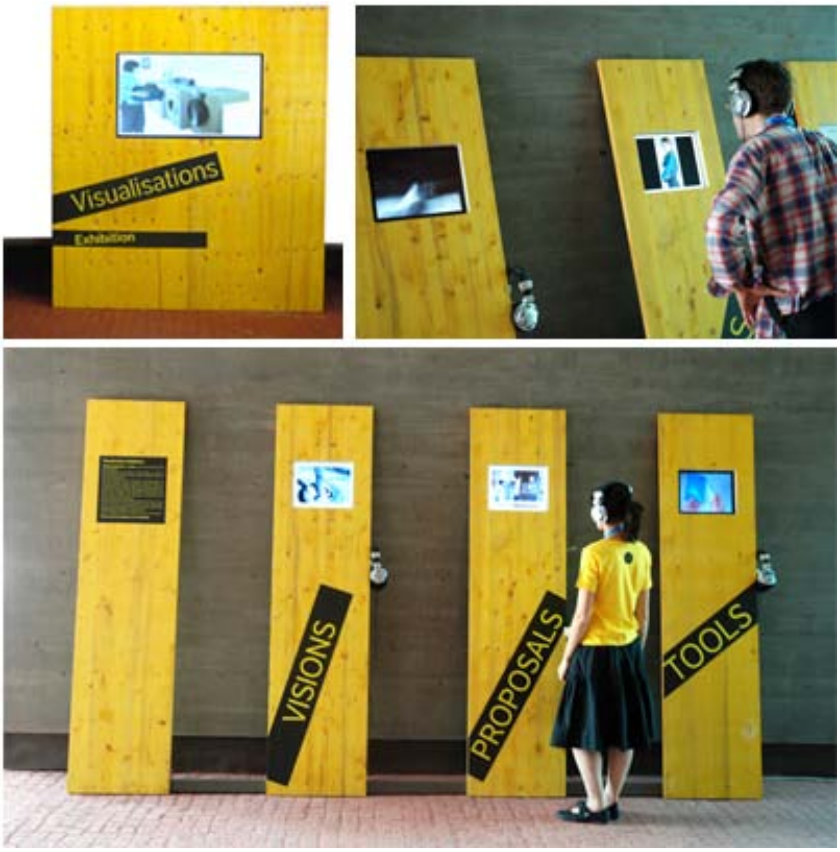


Fig. 3: Visualizations Exhibition at Changing the Change Conference, Turin, 10th-12th July 2008. Exhibit design and organizational coordination: Claudio Germak.

5. Visualising Design Research Results

We can say that many authors chose a Power Point presentation method. Maybe, it is the standard method for making a presentation, even within the design research community. Anyway, we are a scientific community of researchers, let's say an academic community, talking each other by a list of points organized into slides. Many design researchers are not designers. What's more, they are not communication designers. Even though designers can manage complex systems and artifacts, in many cases theyr're not used to broadcasting their knowledge, to making it comprehensible to a wider public or translating it into different communication languages and formats.

Visual and audiovisual communication has a target of reference, it always knows who is talking to and it always has a format for doing it. We, as researchers, are very good presenters as speechmakers. Needless to say, images have a different grammar, language and rhetoric for making sense.

A famous essay by Edward Tufte (2006) attacks the cognitive style of Power Point, a monopolistic "bureaucracy infected throughout by the pitch culture". Power Point style is a given. It immobilizes presenter's variability and his style is pre-determined.

How can we make visual productions with a more personal and communicative style? How can we produce visions and visualize imaginative worlds for "changing the change"? Looking at final Visualizations, the most emotional and effective are the ones with characters, showing actions; the ones with metaphoric objects building a narrative path or graphically building a space for the community presented. Key words can help the comprehension of images, not long paragraphs of text. What's more, introducing the idea of sequence into a presentation makes it more effective.

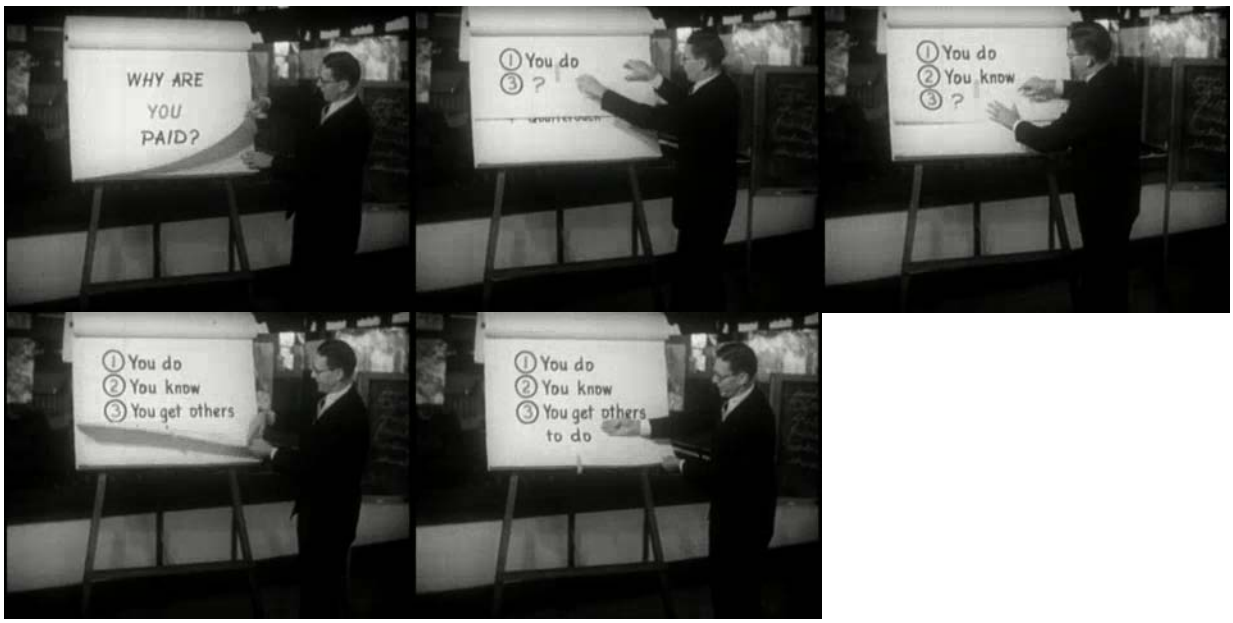


Fig. 4: *Industry on parade: Sylacauga Saga* (Public Domain), part 3: "Seminar For Executives", 7'14", http://www.archive.org/details/sylacauga_saga

Donald Norman (1993) argued that Technology is not neutral. Each technology poses a mind-set that soon informs the way we organize our thoughts and our cognitive patterns for representation. The more successful and widespread the technology is (just think about Power Point!) the greater its impact upon the society.

That's why, even though we asked authors to produce a sequence of pictures and images or a video presentation, most of them didn't refer to the audiovisual language, making sense by the editing of a sequence, but made a sort of Power Point timed presentation. Asking for a slideshow, we intended slides as pictures or frames of imaginative worlds, possibly introducing a third dimension, different layers for representing complexity. The idea of depth of field in photography and cinematography is a good example. We didn't mean bullet points or legends.

On one hand, many of us are familiar with Power Point as a tool for presentations; on the other hand some of us use photography or ethnographic documentation, photographic or illustrated storyboards, mapping and info-graphics as methods for design research practice. Focusing their energy on writing the papers, authors made Visualizations with the same languages of their research practice. Visualizations effectively can be considered as presentations of different approaches to design research, more than communication artifacts of the design research results. We would like to promote the communication of visions of possible worlds.

6. What shall we do next? An Agenda for Communicating Design Knowledge

Which are the next steps to change the direction of change towards a sustainable knowledge society? We have to face two main levels of action: the one that keeps on and bring forward the work we started at Changing the Change Conference; the other one dealing with the possible contribution of communication design for the development and the implementation of the Design Research Agenda for Sustainability.

First of all, we are going to upload Visualizations videos in a dedicated section of the Changing the Change website. In fact, we want to make the material we collected accessible, building a network of visions for communicating international design research.

To achieve this end, according to the policy of sharing knowledge, we encouraged the liberalisation of certain rights, as advocated by the Creative Commons licenses (www.creativecommons.org). Most of the authors accepted this conditions submitting their final

visualizations. Nothing will ever impair or restrict the author's moral rights, but we as organizers of Changing the Change Conference and Exhibit guarantee the attribution of each work and we are now legitimated to distribute and share Visualizations. Works will be accessible to peers and to the extended community of design, as it is a key principle underpinning social interaction.

On the other hand, in order to support the Design Research Agenda for Sustainability, we can define a sort of agenda for communicating design research and knowledge: assuming visions, proposals and tools as a shared framework for design activities, both academic and professional, skilled or not, we can say that processes, methods and outcomes need to be illustrated, exemplified and widespreaded. Of course, we have to refer to the transformation of design within the new paradigm of economic and social processes and, quoting Simone Bertolino (2008) and the Italian Consorzio AASTER (2006), we can identify three typical ideal types of design practices: *communicative work*, *productive work* and *survival work*. We can therefore have a design of communication, linked to the object itself, but also to the symbolic dimension whom the object refers and the process through which it is conceived, conveyed, sold and consumed. A design still focused on the manufacture and finally a design that springs out of marginal situations, both from the society and the market point of view. As many visualizations show, it deals with communities inserting symbolic contents in artifacts that express through semi-artisan design their own common identity. Professional design and design research have to face the challenge of promoting and communicating those different types of design and knowledge coming from different contexts and experiences. It means building scenarios for a sustainable wellbeing in a distributed knowledge economy, but we think that scenarios should integrate *imagery*.

We can hardly give a definition of the term *imagery*, because common language refers to "symbolic", "imagery" and "imagination" without distinction, locating those terms within an unspecified semantic area. In spite of that, it is maybe the most recurrent term in the history of media studies. In this paper we leave out the meaning of *imagery* as opposite of *reality*. On the contrary, we refer to the set of pictures and symbols lying in people's mind, a sort of cultural or trans-cultural archive that we can stimulate and refer to, in order to produce a visionary communication. *Imagery* informs our daily life and puts real facts, figures and objects into a cultural framework and a cognitive pattern for interpreting the world and change it. It should be intended as a cultural tool for political action. Design should translate and shape this rich matter for communicating, both in terms of design knowledge and design education. In fact, it is to be desired that design research learn communication languages in order to understand that an advanced use of storyboarding can be very useful, for example, both as research and negotiation tool. Images are conventional expressions of a particular set of techniques, science and social order in a specific historical moment. The representation of the world by images is a matter of visual and audiovisual rethoric, which is a discipline that examines the expressive power of images in relation or instead of verbal communication. When *imagery* is intended as a social common, communication design has to feed it towards a sustainable knowledge society.

As we already said, the Exhibition offered an opportunity for facing the state of the art: how does design research communicate itself? Visualizations offered a good bent for scenario building, but also showed a lack of *imagery* communication. Now we have to face a new challenge: the integration of *imagery* and *scenario* for new visualizations that can enrich the emerging issues "ways of designing", "ways of living" and "ways of producing". This hypothesis is now orienting our research activities and collaboration to the Design Research Agenda for Sustainability.

Acknowledgments

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We would like to thank **Elisa Bertolotti** (Politecnico di Milano, INDACO Dep.) for her help to collect and edit final Visualizations for the Exhibition; **Mauro Zambetta** (associazione culturale Planalto), for his help to edit videos and for the dvds authoring for the Exhibition; **Mattia Amadori** (olo creative farm) for the music theme of Visualizations Exhibition.

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Fig. 5: Giordana Ferri, Visions – Ways of producing

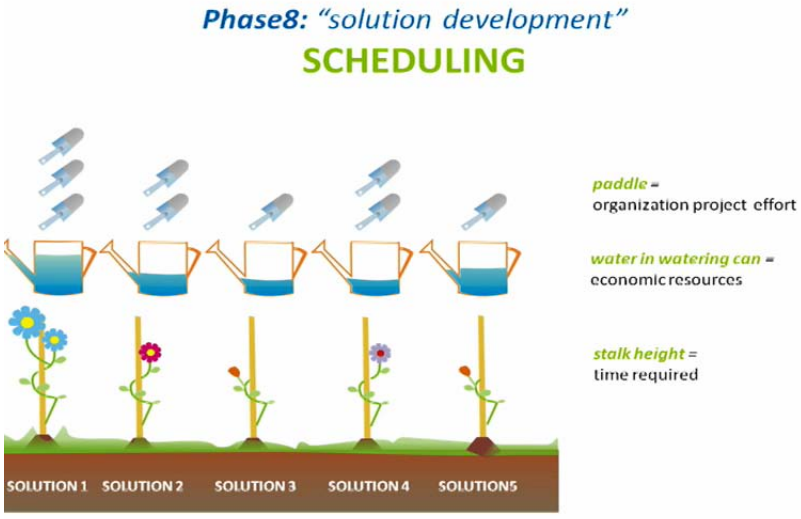


Fig. 6: Manuela Morra, *Contribution of design to EU projects and programs in Italy*, Proposals – Daily life solutions

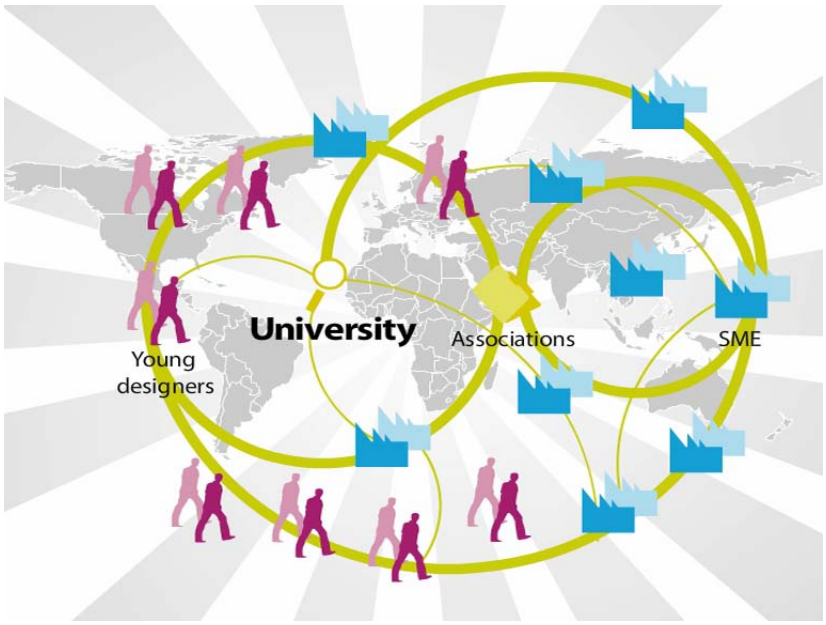


Fig. 7: Antonella Castelli, *Design Directory Italia*, Proposals – Enabling systems.

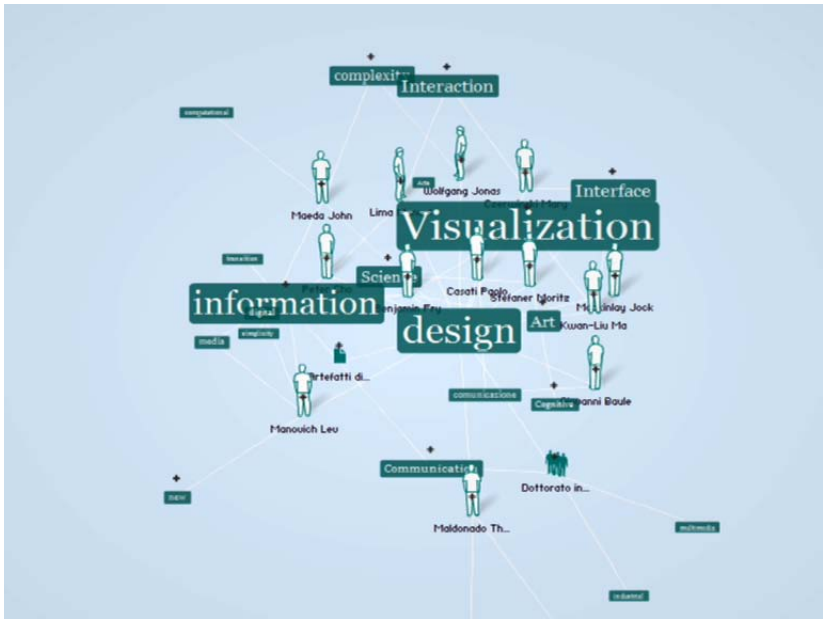


Fig. 8: Marco Quaggiotto, *Knowledge cartography*, Proposals – enabling systems

Fig. 9: Gaia Scagnetti, *Integration through communication tools. How design can facilitate social system integration processes*, Tools - design process

2. Background documents

2.2 DRAS
Design Research Agenda for Sustainability

DRAS
Design Research Agenda for Sustainability

An open and collaborative program

/ *Draft 1* – 12.7.08

Proposal

This *Design Research Agenda* presents some statements, some emerging issues and some promising design research fields and directions for sustainability.

It has two main goals: (1) to outline and progressively consolidate a shared framework for a multiplicity of research activities on design research for sustainability. (2) To trigger new autonomous research programs that will enlarge and or re-orient the present framework in order to give more coherent programs and more effective results.

Design researchers who agree with this proposal should orient their on-going activities, or start new ones, in such a way that they can enrich these emerging issues with visions, proposals, tools and reflections.

Doing so, they will participate in the development of an open and collaborative design research program and, most importantly, in the realization of an articulated but convergent set of visions and proposals (and of the ideas and tools necessary to better understand and implement them).

This document

The process where this document comes from started with the organization of the Changing the Change Conference (and the debates that took place between several involved researchers to prepare it) and continued in the discussions and the co-creation activities that took place during the this same conference.

Its possible future evolution will depend, first of all, on the commitment of the conference participants who will agree with its spirit and its present proposals, and moving from here, to all the other design researchers who will also agree with them.

In conclusion, *this document is a draft, and it will remain a draft*: an open artifact to be integrated by the free collaboration of whoever will accept its spirit and the simple rule it proposes.

Structure. The document is organized in 4 sections:

- *Background statements.* These are some general ideas to be shared by those who intend to participate in this co-creation process.

- *Emerging issues*. These are research themes that, at this stage of the process, appear to be potentially relevant to orient a variety of existing or future research programs.

- *Basic concepts.* This introduces some working definitions, needed to start a conversation within the community. In the future, these working definitions could be up-graded and new concepts could be added.

Background statements

Background statements are some general ideas to be shared by those who intend to participate in this program co-creation process.

Sustainability must be the meta-objective of every possible design research activity.

Sustainability is here intended as a systemic change to be promoted at the local and global scale. It will be obtained through a wide social learning process, re-orienting the present unsustainable transformations towards a sustainable knowledge society.

Design research has to feed the social learning process towards sustainability with the needed design knowledge, that is, with visions, proposals, tools and reflections to enable different actors to collaborate and to move concrete steps towards a sustainable knowledge society.

Emerging Issues

Emerging issues are research themes that, at this stage of the process, appear to be potentially relevant to orient a variety of existing or future design research programs

The following ones are the results of the "Emerging issues" exercise that took place during the Changing the Change conference (10th-12th July 2008). Each one of the six proposed research lines integrates several topics proposed during the first two days of the same conference and has been discussed in one of its dedicated sessions the last day. The specific topics indicated for each one of these research lines is an open list that in the future will be implemented and, if necessary, re-oriented.

1. Ways of living

How to generate radical changes in everyday life, orienting them to visions of sustainable life styles? How to promote sustainable qualities, sharing knowledge across geographical distances, cultural differences and disciplinary barriers? How to develop scenarios and convivial tools, through community generation and activation?

1.1 Physical and social commons and sustainable qualities.

Understanding the "*commons*": from the physical ones (such as air, water, landscape), to the social ones (such as lively neighbourhood, public spaces, sense of community, perception of safety, social knowledge), to the new ones (such as internet and open knowledge). What makes them exist (what is their "glue")? The people and community recognition of the commons in the definition of a sustainable wellbeing; what media and design can do. How to design solutions capable of generating or re-generating the commons?

1.2 Active and collaborative behaviours and the ecology of time.

Understanding "sustainable wellbeing": individual *vs.* collaborative; passive *vs.* active. Sharing different local knowledge. The sense of personal balance as harmony and contentment. The sense of community as communication, protection, participation, recreation, identity, freedom and generosity. A new sense of time, with the re-discovery of *slowness* as a desirable component, permitting attention to the important things in life.

2. Ways of producing

How to promote models of production and consumption based on a sustainable use of physical and social local resources? How craftsmanship, traditional productions and advanced technologies can merge and collaborate in the perspective of a sustainable, distributed knowledge economy?

2.1 Distributed economies and symbiotic production.

Understanding *"distributed systems":* from computing to power generation, from manufacturing to the whole economy. Distributed systems and system resilience. Distributed systems, democracy and power shift. Connecting people, places and things: distributed systems and the convergence with the p2p and open source movements.

2.2 Local development in the global society.

Understanding *"the local":* local identities and cosmopolitan culture; local economies in an interdependent world. How to design the collective local wisdom. Craftsmanship validatation and regeneration. Sustainable tourism ad community-based tourism. Local and seasonal food and new food networks. The "Slow food model" and its applicability in other fields. The design role in local and regional development.

3. Ways of designing

How can designers become agents for sustainability in a society where more and more people have to take design decisions? What are design's conceptual and practical tools in an interconnected world where different (i.e. non-western) narratives are emerging? What is the role of schools and universities in this new context?

3.1 Designing networks and forming new professional designers.

Understanding the new *designer role:* designers as connectors and facilitators, as quality producers, as visualisers and visionaries, as future builders (or co-producers). Designers as promoters of new business models. Designers as catalysers of change.

3.2 Design knowledge and design education.

Understanding the new *design nature* and developing a new *cultural background:* from products to services and systems, from individual activity to collaboration. New designing networks and new learning networks. Changes in the education priorities and methods. Challenge the barriers to Design for sustainability in design schools.. Increase the transfer of knowledge between projects and develop new educational resources. Integrate global and local knowledge.

Working definitions

What follows is a first list of working definitions needed to facilitate the conversation among the researchers involved in this program's co-creation process.

***Sustainable society**:* a society where all the people and the communities have the same possibilities to live well (that is, to be what they want to be and do what they want to do) in a sustainable way. That is, maintaining their environmental footprint in the limits of the ecosystems resilience, and regenerating the quality of the physical and social commons.

Design for sustainability: everything design can do to facilitate the social learning process towards a sustainable society. That is, to sustain promising social and technological innovations and to re-orient existing drivers of change towards sustainability.

Design research: an activity aiming at producing knowledge useful to those who design: *design knowledge* that designer and non-designer (individuals, communities, institutions, companies) can use in their processes of designing and co-designing.

***Design knowledge**:* a set of *visions*, *proposals*, *tools* and *reflections:* to stimulate and steer strategic discussions, to be applied in a variety of specific projects, to help understand what we are doing or could do. This knowledge has to be *explicit* (to be clearly expressed by whoever produces it), *discussable* (to permit the exchange of opinions among many interested interlocutors), *transferrable* (to be applicable by other designers) and possible to *accumulate* (to form a reservoir of design knowledge that could be the starting point for producing further knowledge by other researchers).

2. Background documents

2.3 Invited speakers

Ovierview on invited speakers participation

International speakers have been asked to give an overview of their countries or regions, in terms of design research and its contributions in changing the change. As a whole, they outline the state of design research for sustainability worldwide. These presentations will take place each day, in late morning plenary sessions.

Bill Moggridige, IDEO
USA

It's getting so complicated! Design research methods to change the vector of change in an increasingly complex world.

Complex problems are messy! They make your head hurt! They are difficult to understand and challenging to solve, but they are often the ones that make a difference to the sustainability of our society and planet. If designers are to change the vector of change, we will need clarity about the directions that we choose as well as our methods.
The paper describes the design research methods that he has seen employed in the USA, as well as elsewhere in his travels, both in general and for sustainability. It examines the design research methods that are used as part of the design process, as well as the research about design itself, illustrating his findings with examples.

Geetha Narayanan, Srishti School of Art, Design and Technology INDIA

The Taste of India. India as Design or Designing India.

Beginning with the local and with an India set in the early 50s and 60s the paper juxtaposes the development of the culture and the business of food and food related products and services in India against the rapid panoramic change that the country has seen in the last two decades.
Using real voices of designers, the paper intersperses commentary with dialogue enabling an understanding of the complexity embedded in the field of design, design research and practice in India today.
What emerges from this is a set of conundrums that highlight design-related concerns for the future.

Luisa Collina, Politecnico di Milano
ITALY

In which way in EUROPE design is, or is not, an agent for sustainability?

In Europe, several PhD programs in design have been established. Some of them started research lines on design for sustainability or, more precisely, on the different possible intersections between design and the emerging environmental and social problems. Complementary to these academic institutions, other organisations have developed, and are developing, interesting initiatives. For instance: some EU funded projects, some independent programs (as the Sustainable Everyday Project, Doors of Perception or Multiplicity), some entrepreneurial activities (as the ones promoted by Philips Design or Design Continuum).
The paper will move from the map of these initiatives and research lines, to discuss their cultural and social background and perspectives. The paper main aim is to present the potentiality of the European design to the worldwide demand of design research for changing the change.

Mugendi M Rithaa, Cape Peninsula University of Technology
SOUTH AFRICA

Engaging Change. African Universities' Response to Design for Sustainability.

Africa has a predominantly youthful demographic- it makes sense to engage the youth at a time when societies can indeed change the change. This paper presents an overview of design education in a number of African universities. The information covered includes their student profiles and details of design programmes with a specific slant on sustainability. Of particular interest (and relevance to CtC) is the question of how flexible the curricula is in response to the needs of local communities and societies in a formal (or informal) sense.
It is heartening to note, that in spite of pervasive financial limitations, a vision of a sustainable future is still possible. To realize this vision requires a proactive and creative response. Some of the institutions presented in this paper have embraced the ideals of design for sustainability and are actively equipping future designers with requisite skills for bringing about positive social transformation.

Aguinaldo dos Santos, Federal University of Paraná
BRAZIL

Design research and locally-based social initiatives.

In South America, due to poverty, a large portion of its society has learnt to live with fewer resources, paradoxically surrounded by an abundance of resources. On such environment entrepreneurship, flexibility with cultural diversity and easiness to deal with uncertainty is required from people on a daily basis in order to guarantee survival. Such environment aligned with an increase on the education levels, political awareness and information access, has induced a widespread of locally-based social initiatives that in many cases represent truly innovative social changes towards sustainability. Hence, based on this context, this article presents emblematic case studies gathered mostly in Brazil, trying to understand their underlying strategies to radically change current patterns of consumption and production.

Lou Yongqi, Tongji University
CHINA

Calling for “She Ji”: Rethinking and Changing the Changes in China.

This paper gives special attention to China’s traditional “She Ji (design)” system which almost been replaced by western oriented modern design disciplines for century. The advantages of "She Ji" notion have become increasingly obvious according to the criteria of sustainability. The considering of sustainable develop provide a pause for rethink, revaluate, and redesign many phases and changes in China. This paper tries to outline a vision that the dual-structure of “She Ji (design)” system can offer new philosophies and methodologies for Chinese design, design education and design research. The ways in which design can play important roles in culturally conscious and be an agent for sustainability in China is also explored together with some cases.

Fumi Masuda, Designer, Tokyo Zokei University
JAPAN

Asian view of sustainable future.

In order to explain possibilities and evidences of “Changing the Change”, the paper will start from the historical background of Japanese craftsmanship and will arrive to outline the on-going tendencies in eco-design, and in the emerging consciuness that eco-design is not just to improve products, but is the actualization of sustainable society.
As conclusion, the paper will propose the idea that, although Asian societies certainly are going through a radical change, there are also unchanging cultural aspects. One of this is flexibility in change. Historically, both natural and cultural sustainability had been secured through this flexibility and hopefully this system will be able to work out for the future to come.

Chris Ryan, Melbourne University
AUSTRALIA

An rapid re-focusing on sustainability.

Two issues explain the connection between design and sustainability in Australia. The election a decade ago of a national government that viewed 'climate change' as a threat to its (fossil fuel) business power base, and the visibility of climate change because of drought (cities are rationed and agriculture and national river systems are threatened). Concern about water and climate change was instrumental in the defeat of the national government last year. In the practice of design, as in other areas of business, there is a rapid re-focusing on sustainability. However, the orientation is again towards 'eco-re-design' not design for systems change. In recent large scale government programs to 'promote' design, there is still a real disconnect between design promotion and eco-innovation.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

It's getting so complicated!

Design research methods to change the vector of change in an increasingly complex world.

Bill Moggridge[1]

Abstract

Complex problems are messy! They make your head hurt! They are difficult to understand and challenging to solve, but they are often the ones that make a difference to the sustainability of our society and planet. If designers are to change the vector of change, we will need clarity about the directions that we choose as well as our methods.

Bill describes the design research methods that he has seen employed in the USA, as well as elsewhere in his travels, both in general and for sustainability. He examines the design research methods that are used as part of the design process, as well as the research about design itself, illustrating his findings with examples.

Contents

[1] Bill Moggridge, Cofounder IDEO, bmoggridge@ideo.com

1. It's getting so complicated

I studied Industrial design at the Central School in London in the sixties. The course was very practical, with a small studio of twelve students learning through a series of design projects. We were taught lots of skills of drawing and model making, which were exercised in the design of a series of products over a period of three years. The assumption in the curriculum was that we would spend our whole careers designing everyday things for work or life, that our employers or clients would be British companies, and that the leaders in the companies and organizations would decide what products we should design. This situation only lasted five years after I graduated.

It's true that the first consumer product that I designed that went into production was an electric toaster for the UK branch of Hoover, and my first design award was won for a Microscope for a British company, but after that things changed fast! It was like a preview of globalization. Britain announced the decision to join the EEC (European Economic Community) in 1967, becoming part of an economically united Europe. This caused a competitive shakeout, with best companies gaining a continent-wide market and the less strong ones vanishing surprisingly quickly. Britain was strong in service industries like banking and insurance, but weak in most of the manufacturing industries, so that by the time I started my design firm in 1969, most of the clients were in other European countries instead of on home ground. This resulted in my working in ten countries during the seventies, getting used to travel and to the idea that the world is large and diverse. There was an answering machine in Italy, a computer in Spain, a marine radio in Sweden and telephones in six countries, but not in Britain.

Next came the invasion of digital technology. Electronic chips were turning up everywhere, so that more and more products included hardware and software. If we were to design things for people, we had to design the electronic behaviors as well as the physical objects, or we would only solve part of the problem. This led to starting a second office in California's Silicon Valley, developing the practice of interaction design, and forming teams of designers with varying backgrounds, including industrial design, interaction design, human factors, cognitive psychology, mechanical engineering, as well as hardware and software engineering. The design context was too complicated for even the most renaissance individual designer to be effective.

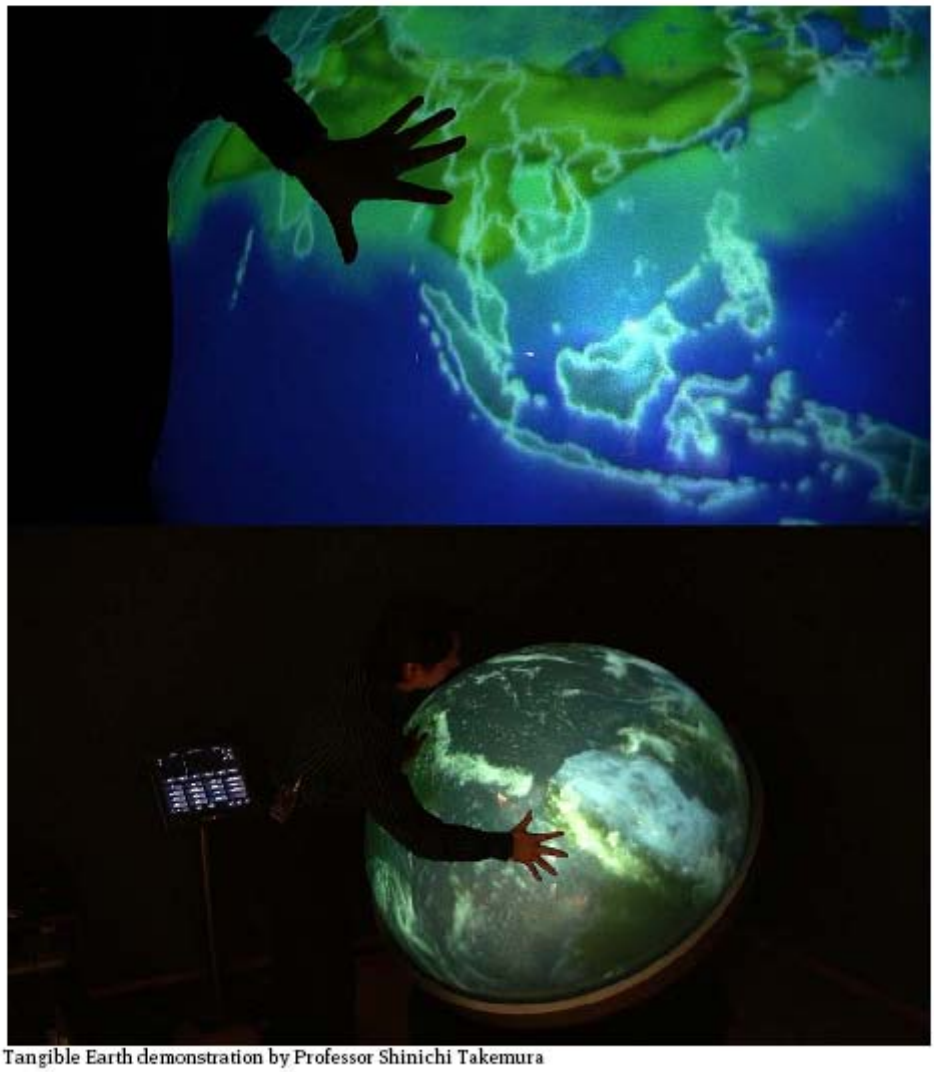
When the internet surged in scale, becoming ubiquitous and accessible, the world suddenly got smaller, as everyone with online access could be connected to anywhere. Globalization was enabled. We could employ resources across national and continental boundaries in real time. Design contexts took another leap of complexity, as now connected technologies were being employed to create complete experiences. We designed websites, connectivity tools, and services that included elements of physical and digital design. We also found ourselves needing to design online solutions to systemic problems in a global context.

Can we design for social innovation towards a sustainable world?

Now we are facing a future where the design context needs to be the whole planet, as we face climate change and realize that human behavior has an increasing impact on everything. Complex problems are messy! They make your head hurt! They are difficult to understand and challenging to solve, but they are often the ones that make a difference to the sustainability of our society and planet.

People may change if they are more aware of the situation. More than a generation ago, the grass roots movement towards sustainability in Germany and Scandinavia changed habits about recycling. This social innovation came from the awareness of the general populace and enabled the implementation of sophisticated recycling systems and the development of new materials.

The public in the USA seemed to be ignoring the dangers of climate change and to be unwilling to take any action towards sustainability until the last few years, but at last there is a surge of awareness, triggered by the Iraq war, energy crisis and perception that climate change is an emergency. The traditional media is at last full of the concerns, helped by the visibility of Al Gore and the popularity of his Academy Award-winning documentary *An Inconvenient Truth*.



Tangible Earth demonstration by Professor Shinichi Takemura

Professor Shin-ichi Takemura is a Japanese cultural anthropologist, teacher and social media designer. He has created a representation of the world called *Tangible Earth* that connects us very intimately to the condition of our planet. Here is a wonderful example of a design that takes advantage of digital technology and the connectedness offered by the internet, to help us feel directly and emotionally the condition of our planet.

(http://www.tangible-earth.com/)

The *Tangible Earth* is an interactive luminous world. A transparent hemisphere of 2.8 meters diameter contains a projector with a fish-eye-lens at its center, casting an image of the globe onto the inner surface of the hemisphere. Force sensors recognize the direction of your thrust as you push on the surface, allowing you to spin the globe in any direction and speed that you want. The computers connected to the projector are powerful enough to respond in real time, so that you can see the world move under your hands, giving an emotional sense of what is happening. You feel like an astronaut in space with the means to fly in any direction.

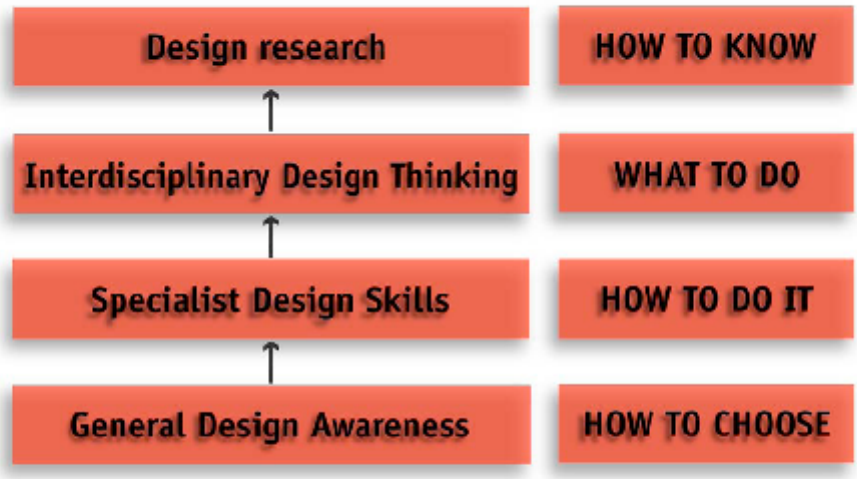
It's not just the satellite view. Takemura and his team have been collecting data for years to allow different representations. The closest to real time is the weather systems of the past four days, played back as a loop of a few seconds, so that you can see typhoons forming or sunny skies approaching. You can see air pollution, ocean currents, bird migrations, earthquakes, temperature changes predicted for the oceans, and global warming projected out to 2050. All of the data is painstakingly gathered from the international scientific community and rendered from the computers to the real time projections. Takemura says:

"I was looking for a way to visualize the reality of what's going on on this planet. It's a matter of information environment. If we design the social signal system so that you can get information in real time, you can make changes by voluntary action. What we need is to design the social use of informational infrastructure. This is what I call social sense-ware to make us more conscious of what is going on in the world. It will become a dynamic self-portrait of our planet, a sensory infrastructure, a public sensory platform for the global age. What we need is the design of media to feel the context of the daily life of the people all over the world to each other."

So far there are several installations of the *Tangible Earth* and Takemura is planning to connect them to each other in real time, as well as allowing access online.

2. Learning How to Know

You can think of design in four levels, forming a simple hierarchy. At the simplest level, people make choices about the design of their clothes or the environments that they live in, based on their awareness of design qualities and issues. Greater sophistication is achieved by people when they learn specialist design skills; they become designers, knowing how to design with greater fluency and expertise; they become adept at the craft of designing, but they usually rely on other people to decide what to design, to define the brief. It is becoming more widely recognized that design processes can also advantageously be used to decide what to do, employing interdisciplinary design teams in processes that harness the powers of intuition, where the shared mind is more productive and creative than the sum of the individual minds. At the highest level, design research can give access to knowledge; both research for a particular project and also research into methods and processes. Let's look at the items in this hierarchy more closely, starting from the bottom.



General Design Awareness

In the Epilog to his book *Emotional Design,* Don Norman says,

"We are all designers. We manipulate the environment, the better to serve our needs. We select what items to own, which to have around us. We build, buy, arrange, and restructure: all this is a form of design. When consciously, deliberately rearranging objects on our desks, the furniture in our living rooms, and the things we keep in our cars, we are designing."

When someone chooses what to wear, how to decorate their home or layout their garden, they are exercising skills of general design awareness. These skills are most visible in countries like Italy or Japan that have a strong aesthetic culture and tradition, but are improving fast in countries such as Britain where design is a subject offered as a major option in schools, so that teenagers can choose design as a mainstream subject and qualification before the go on to university.

Specialist Design Skills

Professional designers know how to create new solutions, based on a synthesis of all the relevant constrains. They have mastered specialist design skills, making them expert at deciding how a design can be formed, and how to create a elegant solution to the problem posed by the constraints, but they expect the context that they operate in to be decided by someone else, normally the boss or the client. This expectation limits the economic value the contribution made by designers. Most current design education is still focused on teaching these specialist design skills, whether the design discipline is industrial design, interaction design, architecture, graphic design, web design, or more craft based disciplines like ceramic or jewelry design.

Interdisciplinary Design Thinking

Interdisciplinary design thinking is especially valuable for deciding what to do in the first place, so that the power of intuitive creative processes can be harnessed to stimulate innovation, solve any type of problem, and develop new opportunities. Design thinking can help with the messy and challenging

problems posed by the complexity of design contexts in the world of digital technology, global connectivity and the need for social innovation. Complex design problems, such as systems or services, will be better tackled by a team of people from varied backgrounds, harnessing intuitive processes, but collaborating so that the output from the *shared mind* is more productive than the sum of individual contributions.

The range of design disciplines from which an interdisciplinary team is formed for a *Social Innovation* project at IDEO normally includes the human design disciplines, such as ergonomics, psychology, anthropology, industrial design, interaction design and graphic design. It includes people from the technical design disciplines, such as computer science, materials science, mechanical and manufacturing engineering. People from non-design disciplines also contribute to the projects, typically those with business and brand backgrounds, as well as writers, storytellers and prototype developers, for physical, digital and video prototypes.

For example, in the USA a lot of people are fat. Obesity has reached record-breaking levels, especially among children and teens. According to the Center for Disease Control (CDC), an estimated 17% of children and adolescents aged 2-19 are overweight. Resulting from an imbalance in the number of calories consumed and those expended, this epidemic involves genetic, behavioral, and environmental factors that could lead to serious health problems later in life. The problem is growing fast. In 1990 there were no states with a proportion of obese adults as high as 15%, but in 2006 there were 24 states above 20% and 21 states above 25%.

(CDC Behavioral Risk Factor Surveillance System)

The CDC, a sentinel for global health and wellness, strives to provide people with reliable health information and the benefits of strong public and private partnerships. Recognizing the growing obesity epidemic, the CDC and the Academy for Educational Development engaged IDEO to conduct a workshop relating to research done around lower-income women and exercise. The brief workshop led the CDC and IDEO to another project for social impact, looking at fruit and vegetable consumption among tweens.

In this current project, IDEO and the CDC are examining ways to change the habits of an entire generation of tweens, a group susceptible to changing attitudes and behaviors about health before they become life-long issues. To date, IDEO has begun observations with a number of stakeholders and change agents. While still in the early phases of development, and with final deliverables still undefined, the team is looking at communication, product, or service design possibilities to promote wide-scale change and prevention in the battle against youth obesity, and the promotion of fruit and vegetable consumption.

You can think about design research in two main categories; research as part of the design process and research about design. When part of the design process, research methods can be included in conjunction with *specialist design skills* as well as *interdisciplinary design thinking* and therefore should not be separated at a higher level on a hierarchy. Research about design is more definitely an enquiry about *how to know*, and deserves the location at the top of the list. Let's look at the two types separately.

3. Design Research *in* Design

If your goal is social innovation through design, your product, service, or organizational structure has not even been thought of, so by definition it cannot be explained to research participants. This is where mindsets and methods for design research are needed to discover latent needs and desires that will help the members of the design team define potential opportunities.

Design research is most valuable when it is fully integrated into the process. Jane Fulton Suri, Chief Creative Officer at IDEO, describes the way in which design research methods can inform the collective intuition of a design team.

(Fulton Suri 2008)

"To inform intuition, it is important to have team members actively interpret the richness of evidence and discoveries as they emerge. Research that brings rich information will provide not just facts, but insights and possible reasons behind the facts. Even seemingly bad news – that we have been considering something that seems to be a fruitless opportunity or a concept with serious flaws – can serve as inspiration for new and better ideas, instead of signaling a depressing failure. With richly understood bad news, we can adjust our assumptions and perhaps see a new opportunity to move in a more fruitful direction. A huge opportunity for learning is missed when research phases are simply tacked on to a program as 'safeguarding' or when research activities are outsourced to a separate team.

To be effective, decisions informed by design research demand a much higher level of personal commitment and engagement at all levels within an organization than do judgments based purely upon hard facts and objective data. Design research often means changing the way work gets done. It means getting out of the office, being where customers are, becoming aware of and sensitive to social trends and the broad ecology of stakeholders, rolling up our sleeves to try out unfamiliar things first hand.

The largely qualitative and interpretive nature of design research is its strength, but this also makes it potentially vulnerable to invalid or ill-founded conclusions. In order to be done well, design research demands that everyone involved be prepared to grapple diligently with ambiguity and nuance. It asks us to bring creative energy to the synthesis of confusing and conflicting information, to be willing to challenge and adapt our own and our colleagues' interpretations, and to stress-test these interpretations both with other points of view and in the harsh light of relevant evidence, even if such evidence is not statistically-proven fact.

This degree of direct involvement often brings another advantage to the design and innovation process – that of creating common ground and shared perspectives among people representing multiple functions within an organization, in ways that have seemed previously unachievable. Enabling teams to share raw evidence and create meaningful frameworks, principles, goals, criteria, and priorities together energizes movement forward with much more enthusiastically supported ideas and greater confidence. In this way, successful design research first requires, then perpetuates, forms of cultural transformation in organizations that enable radical innovation to thrive."

Jane categorizes design research in three types:

- Generative: gaining insights and opportunities – research that provides human-centered insight, revealing new ways of framing opportunities and inspiring new ideas.
- Evaluative or Formative: learning and refining – research that provides continual learning throughout the process to determine the what, how, and to whom of the offering.
- Predictive: estimating potential – research that helps to estimate the scale and potential of an opportunity even when most variables are unknown.

1. Generative design research

Generative research involves looking for emergent patterns, challenges, and opportunities. The intent is that ideas about new possibilities are informed and inspired by understanding people's aspirations, emotions, perceptions, and motivations within their social, cultural, and technology context. Crucially, it is about interpreting this understanding to inspire new perspectives that disrupt current conventions and ways of seeing things.

For example, after a series of workshops examining various world issues, the Acumen Fund and IDEO decided to pursue the issue of clean water usage in the developing world. The Acumen fund tackles some of the world's most challenging needs for social innovation by combining venture capital with philanthropic business practices.

Currently, 1.2 billion people worldwide are drinking unsafe water. Despite efforts to provide clean and treated water, supplies often become contaminated through improper transport and storage. The approach to design research has been immersive, with IDEO's team spending time in Africa and India in the communities where an absence of clean drinking water is prevalent. We hope to have working prototypes of products, services, and business models that can be implemented by developing world entrepreneurs in 2008.

2. Evaluative or formative design research

Evaluative or formative design research is where design research and prototyping overlap. As soon as ideas emerge that are worth trying, they can be given form, whether as sketches, models, stories, videos or other kinds of prototypes, allowing an iterative series of 'learning loops.' In design research, ideas don't stay intangible or ambiguous for long. In this context, a prototype is simply a visible or tangible representation of an idea, to be thought of as a probe or thought-experiment; it is not a full-fledged pilot or a preproduction version of the real thing.

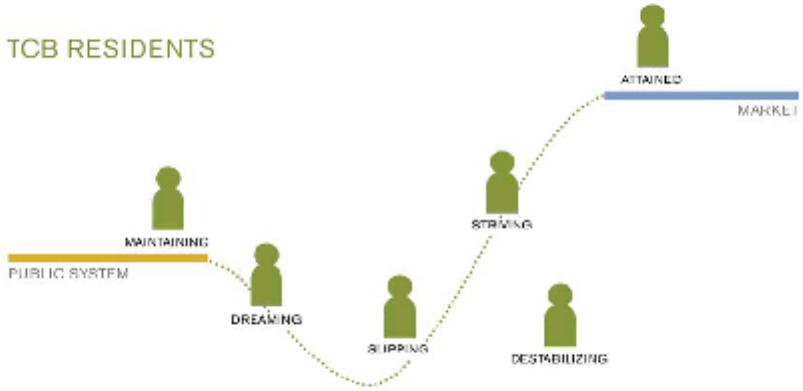
Evaluative design research is about building confidence by addressing questions and uncertainties *as they arise*. Frameworks, ideas, and concepts are shared in various ways as prototypes from very early (even in insight-gathering phases) to late in the process in order to learn from other people's reactions, and to check, revise, and refine assumptions.

For example, when working with the American Red Cross (ARC) to increase the national blood donor base, spurred by conversations with existing and potential donors, IDEO looked at ways the ARC could refocus its emphasis on the donor as the most valuable asset and gain greater emotional relevance with potential donors. Ideas emerged and IDEO designed and prototyped full-scale spatial layouts, furniture components, service tools and protocols for use in evaluative research around the United States.

3. Predictive design research

Predictive research tries to look ahead to estimate the potential of future opportunities and ideas, primarily from the perspective of their business or organizational viability. How confidently can we really predict whether a radical innovation will be a success? If it were easy, venture capital would no longer be needed and everyone would be an entrepreneur. This type of research is much less well-charted territory

for design, as the unintended consequences of design decisions often surprise, particularly at the level of social innovation. Designers need to be more creative in finding good ways to work through these business and organizational questions, both in helping to define potential opportunities and in determining the viability of ideas.



In-situ experimenting seems to offer great potential to social innovation in enabling accessible, rapid, and considerably lower-risk and lower-cost learning than would a full-fledged launch. For example, The Community Builders, Inc., (TCB), an organization dedicated to developing low-income housing communities in the USA, approached IDEO to examine its approach for helping residents and communities realize their full potential. After team members spent time as guests of low income residents in communities around the country, tangible outcomes were developed as a suite of tools named "Ways and Means." These are aimed at transforming TCB's properties from places of residence to arenas of value creation by reorienting offerings from service-based programs to demand-driven opportunities. The tools kits are being tried out in more than 200 situations currently, and will help to evolve the next level of solution.

A similar approach is exploited on an even larger scale by Google, through Google Labs, which has multiple experimental projects running at once and takes full advantage of the nature of hosted software to allow early launches – frequently updated in response to what is learned from users – of what effectively become eternal beta versions of their offering.

In summary at the end of her article, Jane Fulton Suri says;

"Both a personal and an organizational mind-shift are required to get comfortable with the emphasis that design research places on informing our intuition. Like many people in our culture, my formal education placed higher value upon received knowledge than upon personal discovery. But the longer I practice design and innovation, the more I am convinced that true learning comes not only from ready-processed data, but also from concrete sensory evidence and direct subjective experiences that have the power to capture our imaginations and achieve new understanding."

4. Design Research *About* Design

Research about design is not very mature as yet. Most practicing designers *Just Do It*, to quote the Nike slogan, relying on the intuitive nature of their process to yield results. Designers don't worry about underlying principles or postulate theories about methodology. Compare design to the fine arts or poetry. There are plenty of people earning doctorates in the history and theory of fine art and poetry, but nobody expects them to be the same people as those who create excellent art or write beautiful poems.

Korea

Perhaps design is growing up, as interest in design research expands. A methodology for the quantitative assessment of the sustainability management of firms may be the most challenging goal for design research about design, but that is just what Professor Cho, Dong Sung, of the College of Business Administration at Seoul National University, is proposing. The 6th International Design Culture Conference in May was sponsored by the *Korean Design Research Institute* and a *Korean Society of Design Science*. Professor Cho presented a keynote titled *Sustainable Management through Design Creation*.

(Cho 2008)

In his presentation Professor Cho addressed two issues:

- Redesigning the Design Theory for Application to Management.
- Designing a Guideline for Sustainability Management Reporting.

He discussed the objectives of companies and organizations pointing out that there are marked differences between the philosophies applied in different countries. For example:

- In America, the objective is to maximize shareholder value.
- In Europe, the objective is to maximize stakeholder value.
- In Japan, the objective is to maximize employee value.
- In Korea, the objective is to maximize major shareholder (i.e. owner) value.

He gave a critical analysis of existing guidelines for sustainability reporting, pointing out that they are investment driven rather than performance driven, that they impose high hurdles and that they have no auditing. He enlisted the efforts of the BEST (Business Ethics is the Source of Top Performance) Forum, a group of Korean firms inaugurated in 2003, which proposed a sustainability report guideline that was adopted by the Korean government. He explained concepts for the quantification of performance criteria, an auditing system, and the design for a dual reporting system.

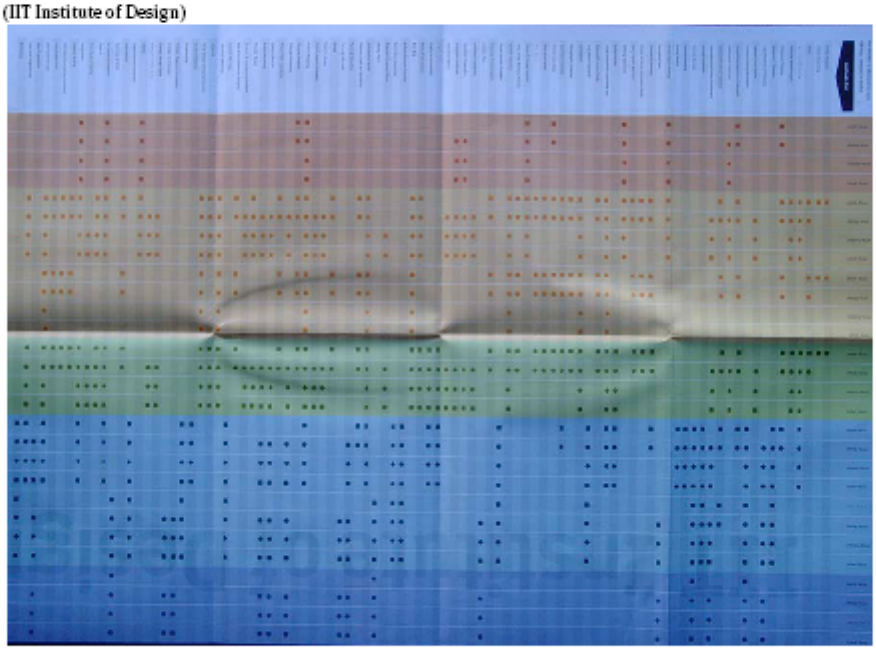
The characteristics of the BEST Guideline embrace subjective criteria such as harmony, balance, unity and rhythm, as well as objective characteristics such as reporting systems, standards, compatibility with other guidelines and report auditing. Professor Cho expects that his new approach will be adopted soon by the Korean government, so perhaps leadership about design research for social innovation and sustainability will come from this initiative.

USA

Most design education in the USA is still very pragmatic, but there are some respected centers of design research. IIT ID in Chicago, where the strongest tradition of Design Research in the USA resides, has published a poster containing over 90 design research methods taught at the school, analyzing them

by mode, so that one can see at a glance where each method can be used, and whether it is focused on users, offerings, company or market.

(IIT Institute of Design)



CMU (Carnegie Mellon University) is another interesting center for ideas about design research. Richard Buchanan, Professor of Design, leads an eclectic and international team of contributors to *Design Issues*, a journal of history, theory and criticism about design, published by The MIT Press.

(Design Issues)

At IDEO, our contribution to design research about design has been to publish team our methods whenever they are evolved to a cohesive level. We have achieved this with our *Methods Cards* describing fifty-one methods for design research. These are all about discovering what people might want and need, revealing opportunities for innovation and inspiring fresh ways of thinking about new possibilities.

(IDEO Methods Cards)

We added ergonomists and psychologists to our staff in the eighties and by the nineties their contribution had proved so valuable that we decided that every project should include their input. As time went by, they evolved a substantial portfolio of tools and techniques. When the number of methods was approaching fifty, one of the team suggested that they represent them as a deck of cards.

The idea of the methods cards is to make a large number of different techniques accessible to all members of a design team and to encourage a creative approach to the search for information and insights as their projects evolve. The intention is to provide a tool that can be used flexibly to sort, browse, search, spread out, or pin up. One can use the cards after a project briefing meeting, working through the pack as if in a game of patience and selecting the most useful set for that particular project in its various phases.

Each of the fifty-one cards contains explanatory text about how and when the method can be used and a brief example of its application to a real design project, with an illustrative and sometimes whimsical image on the other side. The cards are divided into four categories, ranging from the objective to more subjective—Learn, Look, Ask, and Try: "Learn" from the facts you gather," Look" at what users do, "Ask" them to help, and "Try" it for yourself.

It is generally most valuable to apply, or sometimes modify, a range of different methods for any given project. The most useful set will depend on whether the purpose is primarily a generative one of defining design opportunities for particular kinds of users or a domain of activity, or an evaluative one of refining specific design ideas as they develop. In an evolutionary project, where the new design will be closely related to something that exists, techniques that yield explicit information about a particular context and usage may be valuable. If the project is revolutionary—the design will set a new precedent—methods that help the designer understand a broader domain of activity and related latent needs may be more appropriate.

5. The Designers Accord

The Designers Accord is a global coalition of designers, educators, researchers, engineers, and corporate leaders, working together to create positive environmental and social impact. Adopting the Designers Accord provides access to a community of peers who share methodologies, resources, and experiences around environmental and social issues in design. Any designer, consultancy, or organization creating consequence at scale should join.

(http://www.designersaccord.org)

Valerie Casey is now at IDEO, but she was working with *frog Design* when she instigated this endeavor. Here is how she describes the initiative:

"This proposal began as a personal project, and has grown with the support of a loosely connected and passionate group of people

The inception of the initiative was rather simple. My revelation - or, the "spear through the heart" moment, as one of my green friends calls it - happened as I was sitting on a 50-seater jet, crossing the country for the third time in a month. I had just pitched a packaging project for one of the world's largest delivery services. Earlier in the week, I had discussed new diaper design with one of the world's largest paper product manufacturers.

I was acutely aware of each company's middling environmental record, but I was ill equipped to engage in a productive conversation with either of them about their environmental impact or propose sustainable alternatives. In addition, I was vaguely anxious about bringing up this sensitive issue and possibly losing their business. The negative rhetoric about the cost of green alternatives and accusations of greenwashing has made many companies bristle before a meaningful conversation can even begin.

That was the winter of 2007. At that time, I undertook a program to educate myself and my design teams about green design so that none of us would be in that position again. Throughout my fifteen years of design experience, I have been able to learn about technology, market trends, and organizational behavior, and speak about them with credibility and confidence. I believed I could do that again, with the most critical issue to date. I wrote a "Kyoto Treaty" of Design on that plane trip. Now, with the support of many experienced designers, activists, and thinkers, I feel it is the right time to bring a more developed version of the Treaty - now called The Designers Accord - to the broader design community. I hope you agree.

Thanks, Valerie Casey"

The goal of the Designers Accord is to create positive impact for social innovation and sustainability. There are three ways to join:

- Adopter (design firms, corporations, educational institutions) An organized group within the creative community who pledge to work through the guidelines.
- Supporter (artists, freelance designers, students) An individual who is making the guidelines relevant to their personal practice. Like adopters, we expect supporters to evangelize the movement within their communities.
- Endorser (organizations) Organization that adds awareness to the cause, and can provide infrastructure for education and outreach programs (like AIGA and IDSA).

All adopters, supporters, and endorsers follow a basic code of conduct: do no harm; communicate and collaborate; keep learning, keep teaching; instigate meaningful change; make theory action.

When Valerie started The designers Accord in July of 2007, she managed to enroll 450 people in three countries and covering four design disciplines. Now (June 2008) there are over 100,000 members in 100 countries covering all the design disciplines. This dramatic expansion shows that we are hungry to make a difference by working together for social innovation and sustainability.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Engaging Change

an African perspective on designing for sustainability

Mugendi M'Rithaa[10]

Abstract

Africa has a predominantly youthful demographic- it makes sense to engage the youth at a time when societies can indeed change the change. This paper presents personal reflections on design education at tertiary level in a number of African contexts. Though their specific responses vary in degree (and direction), there appears to be a deliberate attempt at addressing sustainability from uniquely local perspectives.

Notwithstanding pervasive infrastructural and financial limitations, a vision of a sustainable future is progressively emerging. To fully realize this vision requires a proactive and creative response. Some of the institutions presented in this paper have embraced the ideals of design for sustainability and are actively equipping future designers with requisite skills for bringing about positive social transformation.

Keywords

African Renaissance; Design Education; Design for Development; Design for Sustainability; Network of Africa Designers; *Ubuntu.*

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1. An African Perspective

Africa is not homogenous, but a vast and diverse continent with a richness that is ill-appreciated. There are 53 independent states under the umbrella body of the Africa Union. The continent has a combined population of 840 million people- the vast majority of whom are youth. This burgeoning population is projected to reach a billion in less than a decade form now. “Africa bashing” as described by Frederick Cooper (1997, 189 cited in Ibhawoh and Dibua 2003, 61), “sometimes sounds like the ‘resurrection of the myth of a backward Africa of an older era’”. Pascal Eze calls this *PIDIC*- an acronym he coined to describe the asymmetrical fixation and reporting on *poverty, instability, disease, illiteracy* and *corruption* (Jere-Malanda 2008, 1). When one looks beyond this form of glorified pessimism, a picture of a vibrant engaging and resilient people begins to crystallise.

Africans are beginning to redefine their own destiny in terms amenable to their own aspirations. To this end, South Africa has emerged as the champion of a rejuvenated and increasingly confident people. From its origins in South Africa, the much touted African Renaissance has captured the imagination of the continents’ denizens. Eddy Maloka (2001) quotes the African National Congress’ “Developing Strategic Perspective on South African Foreign Policy” discussion document of 1997, in identifying the following as the key elements of the “African Renaissance”:

1. The recovery of the African continent as a whole
2. The establishment of political democracy on the continent
3. The need to break neo-colonial relations between Africa and the world’s economic power
4. The mobilization of the people of Africa to take their destiny into their hands thus preventing the continent [from] being seen as a place for the attainment of the geo-political and strategic interests of the world’s most powerful countries; and
5. The need for fast development of people-driven and people-centered economic growth and development aimed at meeting the basic needs of the people.

The African Renaissance is a stirring metaphor, but must must however move beyond the “triumphalist syndrome” that afflicts many emerging states (Maloka 2001). The continent can only achieve its fullest socio-economic potential if the anticipated action builds upon participatory grassroots ideals. To facilitate the achievement of such goals, the New Partnership for Africa’s Development (NEPAD) was adopted by the Africa Union in 2001. The stated long-term objective of NEPAD “is to eradicate poverty in Africa and to place African countries, both individually and collectively, on the path of sustainable growth and development and thus halt the marginalisation of Africa in the globalisation arena” (Ezeoha and Uche 2005, 6). A peer review mechanism has been formulated to enable NEPAD members to hold each other accountable on a wide range of socio-economic and political issues.

Further, the ancient and time-honoured anthropocentric philosophy of *ubuntu* is being evoked to rally up support for this call. Mfuniselwa Bhengu (1996, 5) describes *ubuntu* as “a way of life that contributes positively towards the well-being of a people, community or society”. Richard Tambulasi and Happy Kayuni (2005, 158) however caution that *ubuntu* alone cannot resolve Africa’s woes and must be embraced “in harmony with democratic and good governance principles”. The strength of *ubuntu* is in its pervasiveness and inclusiveness. In sub-Saharan Africa, it is the relational bond that holds entire communities together through an expanded view of kinship. It is a vital force in a continent that has such a diverse range of cultures, colonial histories, and geo-political realities.

South Africa is undisputedly the pivotal state on the continent currently the largest foreign direct investor in the African continent (Ezeoha and Uche 2005). According to David Fick (2006, 166) this economic powerhouse accounted for 38% of the entire sub-Saharan Africa’s gross domestic product (GDP) in 2004. Other economic successes include its neighbour Botswana, as well as Mauritius and Tunisia (Jere-Malanda 2008, 5). The principle reason for Botswana’s

economic “miracle” is attributed to what Abel Ezeoha and Chibuike Uche (2007, 24) call “honest competent leadership”. Other countries worth emulating for their consolidation of democratic practices include Namibia and Ghana. Africa has the fastest growing market for information and communication technology (including mobile telephony), whilst the economic growth forecast for the continent is a promising 6.7%.

2. Changing Landscape

Agricultural activities account for between seventy and eighty percent of the employment opportunities in Africa. Increasingly greater numbers of the continent’s labour force is exploring alternative livelihoods in the provision of goods and service in the informal sector. To illustrate this trend, the promising evolution of the informal sector in eastern Africa is interogated.

The informal sector is popularly known as the *jua kali* sector in East Africa. This unique phenomenon emerged in Kenya in the 1980s and spread to neighbouring countries in a viral manner. Bani Orwa (2007, 3) identifies the Kamukunji Jua Kali Association as the pioneer of the *jua kali* movement in Kenya having been formed in February 1986. The association received special recognition from the Kenyan government for its contribution to national economic growth and development. *Jua kali* means literally *“(under) the hot sun”*- a term that aptly describes the often harsh conditions under which *jua kali* micro-entrepreneurs and their employees eke out their livelihoods. The *jua kali* sector originally was almost exclusively restricted to artisans converting scrap metal into usable goods. The sector now includes a diverse range of professions, with the scale and scope of the participating businesses becoming the definitive factor. Orwa (2007, 1) emphasizes the sector’s significant contribution of 18.4% of Kenya’s GDP, and the fact that it “provides goods and services, promotes creativity and innovation, and enhances entrepreneurial culture”. According to Sarah Macharia (2006), “every official document defines the *jua kali* sector as micro and small enterprises (MSEs)” or Small, Medium and Micro Enterprises (SMMEs). These enterprises typically employ 1-49 people and are legally exempted from registration with the Registrar of Companies.

The *jua kali* sector is massive in coverage- almost every Kenyan is linked to the sector. It is estimated that 76.5% (5.9 million) of Kenya’s labour force works in this sector (Macharia 2006). Indeed it is the norm for most people employed in the formal sector to run a number of *jua kali* businesses. To put the job creation potential of *jua kali* in perspective, a staggering 95% (450,000) of all new jobs created in 2005-2006 were in the informal sector whilst the remaining 24,000 were in the formal sector (Macharia 2006). Orwa (2007, 6) reports of promising developments such as the recent registration of National Informal Sector Coalition (NISCO), a multi-sectoral body that brings together all *jua kali* associations in the country.

Only 29% of those engaged in formal employment are women whereas in the *jua kali* sector, women constitute the overwhelming majority (62%) (Macharia 2006). This situation is consistent with that found in other countries on the continent. In South Africa for example, rural and peri-urban women form *stokvels* (co-operative societies) for their mutual support and benefit. In Botswana such practices as *molaletsa* (collective labour sharing systems) and *motshelo* (group credit unions) serve an important socio-economic function and are consequently actively encouraged (Ebewo 2005, 96). Indeed, a number of *stokvels* have organised themselves to buy large tracts of land for their members’ benefit. Various grassroots initiatives exist where members channel voluntary revolving funds to their membership. This is particularly important as credit options are limited to people operating in this sector of the economy. Isobel Frye (2006), Andries du Toit and David Neves (2007) note that this “survivalist” informal sector is known as the “second economy” in South Africa- one that is structurally removed from the activities of the mainstream formal economy. Du Toit *et al* (2007) and Macharia (2006) highlight the adverse influence on gender roles on women’s entrepreneurial options. Subsequently there is a proliferation of “me too businesses” characterised by low innovation and even lower technology adoption among the participants Du Toit *et al* (*ibid*). The importance of women as key participants in micro-enterprises cannot be over-emphasized and progressive strategies must take cognisance of this fact- this would in effect translate into more sustainable communities.

In reviewing the prevailing climates for micro-enterprise development in Kenya and South Africa, two distinct realities emerge. Whereas the informal sector receives official recognition and support in the former, the same cannot be said in South Africa where corporate businesses are so dominant that micro-entrepreneurs are virtually denied any opportunities for sustainable livelihoods. In this latter context, the so-called 'second' economy is seen as being retrogressive and a drain on the resources of the formal economy (Frye 2006, Du Toit *et al* 2007). As du Toit *et al* (2007, 32) argue:

> *"Rather than aim at "eliminating" the second economy or hoping that it can somehow be transfigured into the first, policymakers would do better to look carefully at measures that can ameliorate existing power imbalances and reduce inequality. Looking at "what is found there" by a less pathologising, less normative gaze, abandoning the naïve belief that "integration" on its own will confer the benefits of modernity on those who unaccountably remain outside, and looking at the exclusionary implications of mainstream corporate practice in South Africa may help crafting policies that are better at addressing the adverse nature of some of the power relations between poor South Africans and the larger economic formations to which they are connected; policies which value and support the fragile survival strategies that take shape on this hostile and difficult terrain".* Du Toit *et al* (2007, 32)

3. Sustainable Design Responses

The Network of Africa Designers (NAD) is the brainchild of Adrienne Viljoen, the Manager of the SABS Design Institute in Pretoria, South Africa. This loose network was inaugurated in April 1999 and encourages designers from across the continent to network and exchange experiences and information on a regular basis. The now annual Africa Design Day provides an ideal platform for dialogue on design. NAD has membership in nine countries on the continent and this number is growing steadily every year. The bulk of NAD's membership is composed of design educators in tertiary institutions.

The following section is a sampling of some of the unique challenges facing universities on the continent. Further, there is a brief discussion on specific responses towards achieving their respective visions. A summary (Table 1) is provided at the end of the discussion and covers an additional sample of institutions represented by members of NAD.

3.1 University of Botswana, BOTSWANA

The Industrial Design & Technology Department (IDTD) of the University of Botswana was established around 1982. It was initially known as the Technology and Education Studies Department as part of the erstwhile Botswana Polytechnic which became the Faculty of Engineering and Technology of the University of Botswana around 1995. From an initial focus on training Design and Technology teachers, the IDTD began offering an additional programme in Industrial Design to cater for the relatively young but promising manufacturing industry. The first cohort of this programme successfully completed their fifth (and final) year in May 2008.

From the outset, the focus of the Industrial Design programme has been on producing graduates equipped with professional and entrepreneurial skills to aid in the diversification of the national economy. Botswana is the world's largest producer of gem diamonds by volume and has historically relied almost exclusively on the export of the mineral. Further, IDTD sought to compliment national efforts towards value–addition (via jewellery design and related activities), as opposed to the previous practice of exporting raw diamonds to be processed elsewhere.

IDTD offers three modules dedicated to the pressing issue of sustainability, namely; *Design for Sustainable Development*; *Environmental Factors in Design*; and *Eco-Product Design.* These are offered to students specialising in Design Education well as those in Industrial Design.

The staff and students of IDTD have also participated in a number of sustainable design-specific projects with various private and public sector organisations. Additionally, links through

NAD have provided staff and students opportunities to tour design practices, academic institutions, and manufacturers in neighbouring countries. This is significant in view of the relatively nascent design-supporting industry in Botswana. Designers in the country are presently in the process of formalising a design association to facilitate a forum for negotiating their contribution with key stakeholders in the country.

3.2 University of Nairobi, KENYA

The School of the Arts and Design (StAD) of the University of Nairobi, Kenya was arguably the first tertiary institution to train designers in Kenya. Previously all art education was acquired at the pioneering Margaret Trowell College in Makerere University, Uganda. StAD has the widest range of design programmes from undergraduate to doctorate level. These include Graphics, Textiles and Fashion, Interior, Illustration and Product design specializations. Further, StAD is the longest running provider of tertiary level design training, having been established as the Department of Design in 1967. Increased competition (especially over the last five years) from new schools offering specialized courses has led to a recurriculation and repositioning of StAD as a key actor within the regional design landscape.

Design for sustainability is not offered as a dedicated module/course, it is however covered under Materials and Processes, and Product Design. In response to local community and societal needs, StAD collaborates with Non-Governmental Organizations (NGOs), other universities, and organisations that are engaged in development and action research. For example, proactive partnership with NGOs has equipped many crafters/artisans and *jua kali* informal sector operators with requisite design, management and entrepreneurial skills.

StAD intends to roll out a newer curriculum that is more responsive to socio-economic and industrial needs of the country. Further, the School has made specific input in the national development strategy of a vision of Kenya as an industrial state by the year 2030. Other strategies include:

- Building capacity to transform into a centre of design excellence in the East African region
- Strengthening linkages with industry for the benefit of all
- Developing the fields of fine and applied arts, visual communication and design, and performance design and technology by 2011
- Providing incententives (such as awards and scholarships) to enhance competitiveness and innovation among design students

A recent phenomenon in the training sector in Kenya is “training for production”, which perhaps could be more aptly described as “product-based training”. Essentially it refers to an interesting mix of skills development and product development: small producers receive, usually short-term, skills training that is entirely focused on the production of a new or improved product.

3.3 **Federal University of Technology, Akure, NIGERIA**

The Federal University of Technology, Akure is one of the five universities of technology established by the Federal Government of Nigeria in 1982. Industrial design emerged in 1977 when it was carved out of the Fine and Applied Arts of Ahmadu Bello University, Zaria. The programme initially had an art and craft focus and essentially concerned itself with the aesthetic appearance of hand-made products. With the establishment of Universities of Technology, the minimum admission requirements were revised to include chemistry, physics and mathematics. The National University Commission provided the curriculum which was subsequently described as disjointed and lacking in focus by design teachers. The Department of Industrial Design (DID) was established during the 1992/93 academic year and began to formally admit candidates two years later. The design programme sought to provide professional education that focused on the following:

- producing designers capable of understanding and solving complex problems in the field
- to acquaint students with appropriate knowledge and skill necessary to solve design problems
- develop students' understanding and awareness of the social, cultural, physical, technical and economic activities of the Nigerian society;
- develop students' ability to understand elements and principles of design as well as design methods and synthesize appropriate information to produce effective design and prototypes
- develop students' ability to provide appropriate solutions to technological, economic and aesthetic problems of the society.

The Nigerian universities offer Textile Design, Graphics, Ceramics, Glass Technology, Jewellery, and Interior Design. The duration of the programme in the conventional (or traditional) universities is 4 years whilst the Universities of Technology qualification takes an additional year- this adversely impacts on prospective students choosing to study in the latter institutions as they have to delay joining the workforce by a year. Compounding this reality is the inadequate (official) recognition of Industrial Design as a profession in Nigeria. Graduates also contend with the consumers' preference for imported products over locally designed and produced ones.

DID is reaching out to the community and local secondary schools to promote design. The Department has a consultancy unit which is working with the state government in its poverty eradication programmes. The Department has been participating in the sericulture and cottage industries projects in the state for a while with positive results. There are concerted effort is targeting the government and the general public to educate them on the importance of design to the local economy. This is fuelled by the realisation that design education can only make meaningful contributions to sustainable national development when adequate attention is given to art, design and technology at the primary and secondary school levels. Further, design education at the tertiary level must be properly funded with appropriate infrastructure. It is anticipated that these activities will help promote a more positive perception of design in the country.

3.4 Cape Peninsula University of Technology, SOUTH AFRICA

The Cape Peninsula University of Technology (CPUT) came about in January 2005 as a result of a government directive that merged the former Cape Technikon with the Peninsula Technikon. The Department of Industrial Design first began admitting students in 1988 and is presently one of two departments/institutions offering the said course in South Africa. From the humble beginnings where the first cohort of four students qualified with the National Diploma Industrial Design in 1990, the Department now services on average between 160-170 students from undergraduate level through to doctoral studies.

The initial focus of the Department was to produce individuals with the ability to grow the design industry. The fact that there was no locally established market meant that graduates had to be equiped with above-average self-reliance and resourcefulness in addition to the traditional technical competence. The Department's belief that the entry level to the Industrial Design porfession should be a Masters degree – a vision shared with numerous institutions internationally - has allowed it to branch out in fields of study such as Interaction Design, Universal Design, Design for Development, Design for Sustainability, and Participatory Design.

Through its active participation in ICSID-endorsed InterDesign workshops around Design-for-Development themes such as Water and Sustainable Rural Transport, the Department has been particularly instrumental in taking the workshops' concepts through to experimental prototype stage for field testing. Although started in 2005 this process is still ongoing and attracts an increasing amount of provincial government funding based on its proven successes.

It's staff members have been involved in and are part of the executive committee of the Design Education Forum of Southern Africa (DEFSA), a professional organisation of design

educators based in South Africa but with its eye on international cooperation within the Sub-Saharan region. The yearly DEFSA conferences have generated a strong network between tertiary institutions offering design courses which has influenced a number of national political issues related to design education. The DEFSA network has been inspirational and its members have contributed to the growing Network of African Designers some of whose members have made valuable input in this paper.

Ultimately, through it's international contacts and exchange programmes in Africa, Europe, North America and Asia the Department is positioning itself strategically to be at the cutting-edge of technological and theoretical design knowledge and to channel the resultant flow into the African reality. This effectively supports the long-term vision od accelerated appropriate and sustainable development on the continent.

The following table (1) summarizes eight instutional perspectives from a sample of corresponding universities on the continent.

Table 1: Summary of selected institutional perpectives

INSTITUTION	CHALLENGES	COURSES	RESPONSES	VISION
University of Botswana; *Botswana*	narrow economic base: over-reliance on diamonds	design education; industrial design	projects with industry, parastatals and NGOs	diversification of the economy
Kwame Nkurumah University of Science & Technology (KNUST); *Ghana*	negative effects of imported products on local production	Industrial and fine arts (including graphic design)	infusion of indigenous (*adinkira*) symbols in graphic design	mainstreaming appreciation of indigenous knowledge systems
University of Nairobi; Kenya	contribution to newly industrialised status of the country	graphic; illustration; interior; textile & fashion; product design	training of people working in the informal sector	to be a centre of excellence in the region
Federal University of Technology, Akure; *Nigeria*	lack of recognition of the design profession	textile; graphics; ceramics; glass technology; jewellery; and interior design	participation in project of social significance	recognition of design in socio-economic development
Kigali Institute of Science & Technology (KIST); *Rwanda*	reducing dependency on expensive imported products	electrical and mechanical engineering (no design courses offered as yet).	assistance to graduates in prototyping products	promoting self-reliance and entrepreneurship
Cape Peninsula University of Technology (CPUT); *South Africa*	engaging with new geo-political dispensation and technological opportunities	industrial; graphic; surface/fashion; interior; jewellery;	participation in and driving of sustainable design for development initiatives	enhancing peoples quality of life through design; applying new digital technology to accelerate development
Makerere University; *Uganda*	need to support SMMEs	industrial and fine arts (including textile design)	integration of entrepreneurial skills to graduates	sustainable entrepreneurial environment
Zimbabwe Institute of Vigital Arts (ZIVA); *Zimbabwe*	designing in a constantly changing and volatile environment	visual communication (including advertising and graphic design)	working with the resources available to designers	sustainable context-responsive design solutions

4. Building on Local Values

Traditional African societies have always relied on a system of collective responsibility for self-reliance, and mutual assistance known by various names such as *bataka kwegaita* (communal solidarity) among the Banyakore people of Uganda, *boipelogo* (self-reliance) in Botswana, *harambee* (pulling together) in Kenya, and *ujamaa* (familyhood) in Tanzania. Bonny Ibhawoh and Dibua (2003, 62) state that the philosophy of *Ujamaa* "was rooted in traditional African values and had at its core the emphasis on familyhood and communalism of traditional African societies". Indeed, all the traditional value systems discussed here are underpinned by the ideology of *ubuntu*, wherein the (extended) family has acted as the custodian of all that is good and noble within such societies. Despite the massive movement of peoples within and beyond the continent, these values are still cherished and in abundant evidence in the mutually supportive relationships between individuals and their communities.

A number of related concepts further enrich communal life in Africa. With respect to Botswana, Ebewo (2005, 92) discusses the value of *Laedza Batanani*- a form of theatre for development practice (TDP) as "an empowering approach to poverty reduction and community development" in rural areas and urban villages. The focus of TDPs on enhancing a form of functional (as opposed to formal) adult literacy (Ebewo (2005, 93). Kidds (1984, 264) states that TDP:

> *"is used as means of bringing people together, building confidence and solidarity, stimulating discussion, exploring alternative options for action, and building a collective commitment to change; starting with people's urgent concerns and issues, it encourages reflections on these issues and possible strategies for change"* (Kidds 1984, 264 cited in Ebewo, 2005, 94).

This is an excellent way of mobilizing communities for change in low-literacy contexts as the participation is community-based and context-specific and building on Africa's rich oral tradition and indigenous knowledge. Previous top-down approaches such as the Bretton Woods institutions (International Monetary Fund and World Bank) prescribed structural adjustment programmes exacerbated poverty as the programmes did not invite communal participation (Ibhawoh *et al* 2003, 77; Ezeoha *et al* 2005, 8). On the other hand, bottom-up examples encourage participation and ownership (such as the *jua kali* phenomenon discussed previously) thus resulting in promising and sustainable socio-economic development.

5. Conclusion

African societies have proven to have very resilient and sustainable traditional systems that were in harmony with the environments they flourished in long before Western colonisation. Although an abundance of non-African technology has been integrated into the African way of life today, huge opportunities still exist to advance the continent based on its own naturally developed cultural values. To quote Mazrui (1986):

> *"the African family is the most authentic social institution in the post-colonial era. In a continent steeped in artificiality, the African family is more real than many of our countries which are colonially made…more real than our economies most of which are mere shadows.… You see, the family in Africa is vibrant in its emotions, compelling in its loyalties. It is alive and well, living right across the continent"* Mazrui (1986 cited in Takyi and Oheneba-Sakyi 2006, 273).

The continental programme of action known as NEPAD has a coordination mechanism based in Johannesburg, South Africa that could compliment economic strategies across member states of the African Union. NEPAD relies on peer-support and peer-review through loose networks of stakeholders to function. Provided it can muster the necessary political will, NEPAD is the ideal vehicle for mobilising the continent's creative potential and help Africa 'leapfrog' into a truly sustainable future (Manzini 2007).

Du Toit *et al* (2007: 32) challenge the conventional wisdom of attempting to eliminate the informal economy or even absorbing it into the mainstream economy. Instead, an effective policy should focus on "measures that can ameliorate existing power imbalances and reduce inequality" *(ibid).* It would be wiser to remove structural obstacles to the naturally available creativity and

promote government programmes that stimulate the growth of spontaneous economic seedlings through education and appropriate design input. To this end, lessons learnt from the thriving *jua kali* sector are instructive and would provide motivation and inspiration to policy makers grappling with the challenge of harnessing their respective peoples' entrepreneurial potential.

The number of institutions and the variety of their appraoches to design education illustrates the value of diversity. Diversity should be embraced without disjuncture from the common goals and aspirations of the continent. The establishment and expansion of existing networks such as NAD will provide a dynamic platform for sharing knowledge and experiences in the teaching and practice of the design profession in its various disciplines with a tuniquely African perspective.

This vision is message best personified through the example of Kimani Ng'ang'a Maruge who entered the Guinness Book of Records in 2004 for being the world's oldest primary school pupil to enroll for grade one at the ripe old age of 84 (BBC News 2005). He represents the resilience and optimism of a people hungry for opportunity who are willing to learn new and exciting things – a people willing to engage with change. This is the vision that Africa would want the world to share...

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Strategies of Change Towards Sustainability

The South American Experience

Santos, Aguinaldo dos[11]

Abstract

In South America, due to poverty, a large portion of its society has learnt to live with fewer resources, paradoxically surrounded by an abundance of resources. On such environment entrepreneurship, flexibility with cultural diversity and easiness to deal with uncertainty, is required from people on a daily basis in order to guarantee survival. Such environment aligned with an increase on the education levels, political awareness and information access, has induced a widespread of locally-based social initiatives that in many cases represent truly innovative social changes towards sustainable consumption and production. Hence, based on this context, this article presents emblematic case studies gathered in Brazil, trying to understand their underlying strategies to change current patterns of consumption and production. It also presents a general picture of the design research community in Brazil with a focus on sustainable design.

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1. Introduction

Most of the undergoing actions in Brazil on the field of sustainable design do not come from scientific research. Design Research itself is relatively recent when compared to other fields of knowledge. Whilst fifteen years ago there was no postgraduate course on the field, today the country has 10 postgraduate programs, including the only PhD course at PUC-Rio. Furthermore, the interest of the Brazilian design research community on the topic of sustainability is divided with a number of other research themes that are far more consolidated such as ergonomics or semiotics. Indeed, next figure shows sustainability as the focus of only 15% of the papers submitted to the 7th Brazilian Conference on Design Research & Development (2006), the largest event on the field of Design in Brazil.

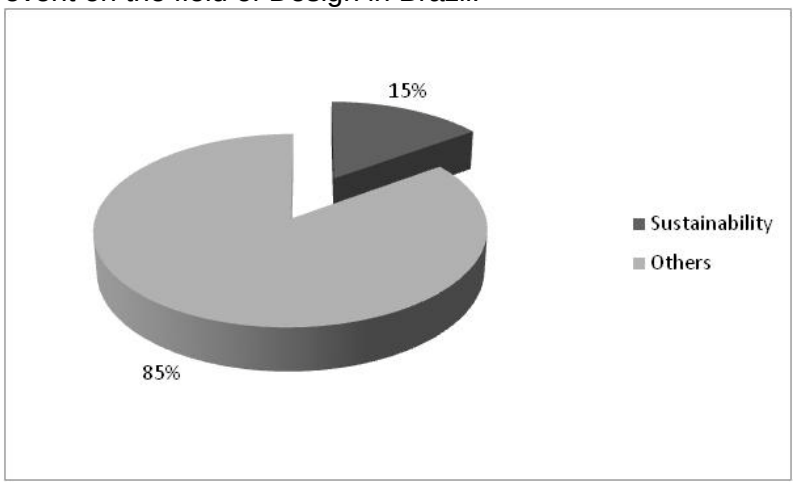

Figure 1 – Amount of Papers Submitted to the 7th P&D on the Field of Sustainability

Developing and disseminating sustainable design knowledge faces the challenge of expanding the amount of research groups as well as improving its geographical distribution. Nowadays there is a concentration of the few research groups with a focus on “sustainable design” around the states of Rio de Janeiro, São Paulo, Paraná and Santa Catarina. As result vast areas of the country present a total absence of sustainable design research even in those areas where there are private or public projects to change current patterns of consumption and production.

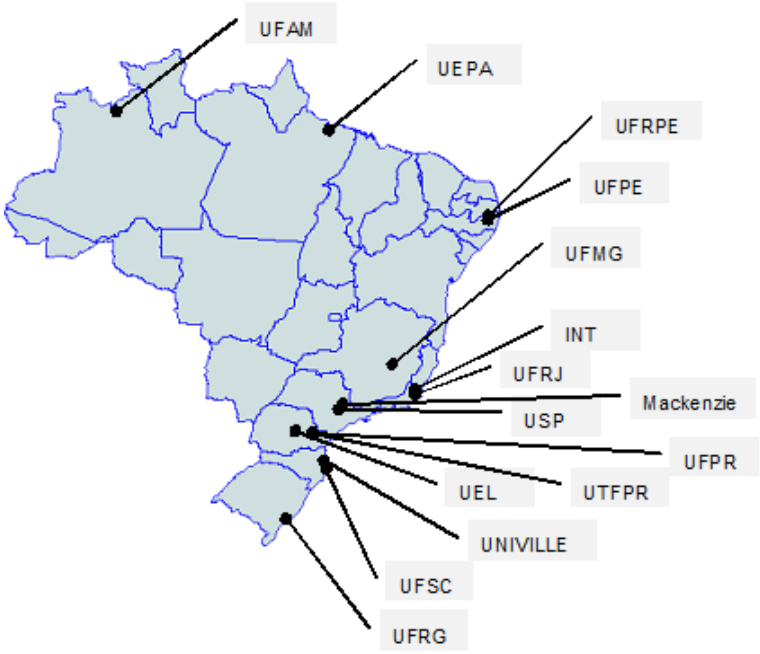

Figure 2 – Location of Research Groups on the Field of Sustainable Design in Brazil

The main challenge for radically change the current patterns of consumption and production is radically increase the number of designers with expertise on sustainable design. A research carried out by this author on the database of CAPES (Brazilian agency in charge of evaluating postgraduate programs) using the keywords “sustainable design”, “eco-design” and “social design” showed a set of only six PhD thesis carried out in this area in the country until May 2008. Also, within the same database and with the same keywords the research has showed a total of 34 MSc dissertations carried out since the year 2000. Taking into consideration that the country has around 300 design schools this number falls far behind the demand for lecturers on sustainable design, let alone the growing demand of the market for design professionals with expertise on this field. With one take the position that every lecturer on design should have basic knowledge on sustainability the target for training could be estimated to around 6.000 lecturers.

In 2007, the I International Symposium on Sustainable design has resulted on the establishment of the **Brazilian Network on Sustainable Design Research**, with the mission of contributing to speed up the amount and depth of design research through an increase in the synergy among research groups, including design offices working on this field. The Network invites designers from around the world to contribute with ideas and actions.

The case studies on the following sections show that the end result on the social dimension of sustainability is already clear (social equity and cohesion, promotion of principles and rules of democracy, promotion of human rights and freedom, achievement of peace and security; access to information, training, employment; respect for cultural diversity, regional identity, etc). The cases present various directions of change towards sustainability where Design Research can play a key role.

2. From Individual Change to Systemic Change Towards Sustainability

2.1 Individual Change

2.1.1 Definition

Change towards sustainability here has two known approaches: the Behaviourist and the Gestalt-Field psychologists. The Behaviourist psychologists would see behaviour modification towards sustainability as the manipulation of stimuli so as to reward a desired activity connected to a sustainable scenario. According to Burnes (1996) the strategy here is to reward immediately all instances presenting the desired behaviour, ignoring all instances presenting an undesired behaviour.

Gestalt-Field psychologists, on the other hand, would understand that individual behaviour towards sustainability as not just a product of external stimuli. Individual behaviour arises from how the individual uses reason to interpret the stimuli. Consequently, according to Burnes (1996) Gestalt-Field proponents seek to help people to change their understanding of themselves in any situation in question, which, in turn should lead to changes in behaviour.

2.1.2 Case Study on Behaviorist Approach: “Ecological Supermarket Check-out” in Curitiba

This is a design led project developed in the city of Curitiba, Brazil, by Albach et al. (2007) as part of a program to reduce urban solid waste, intending to instigate consumer involvement in environmental initiatives and, also, to assess people’s acceptance concerning habit change. Supermarket clients are invited to participate in the initiative by means of two actions: a) bringing their own bags to place some of their purchases on the lookout for the reduction of plastic-bag residues; and b) discarding – in appropriate containers at the side of the Ecological checkout, and according to the consumers’ free-will – packages that do not have to be necessarily brought home.

The “ecological check-out” offers also green plastic bags, which distinguishes the customers’ participation from the other check-outs (ALBACH et al., 2007).

Figure 3 – Packaging disposal besides the ecological check-out

Once the customer has finished his/her purchase, the number of plastic and paper packages left at the check-out is visualized by the customer at the point of sale along with the name of the charity institution that will benefit from the amount of packing collected. The first benefited institution was the school supported by the Paraná State Rehabilitation Association, which assists approximately 200 children and young adults free of charge (ALBACH et al., 2007).

According to Albach et al. (2007) employees from different sectors (check-out operation, supervision, wrapping up, security, data processing, bakery, fruits and vegetables, reception, among others) were trained to fully understand the meaning of the initiative. The intention was that all employees, whether directly working in the project or not, knew and provided information about the Ecological check-out to customers who could approach with doubts. In those trainings, the employees got information on the environmental problems of our society, focusing the generation and discard of packing residues (ALBACH et al., 2007).

2.1.3 Case Study on Gestalt: EEHouse Project

This case study shows an example of actions led by designers (Battaiola et al., 2006) that supported the education of people regarding the use of energy, allowing them to make more judicious decisions. It came from the realization that university courses can (and do) include topics about this subject but the society in general has little access to this knowledge. Thus, it was understood as necessary to implement mechanisms to disseminate energy efficient concepts to the general public.

According to Battaiola (2006) attempts to increase energy efficiency awareness through public campaigns are too expensive and have resulted on limited effects because it is typically difficult for the public to focus solely on one topic (e.g., energy efficiency) over a long time period.. A computer game, accessed through the internet, can provide interactive tools (“edutainment”) to transmit energy efficient concepts to professionals as well as to the public.

EEHouse is a game intended to teach energy efficient concepts to the general public. It was led by designers in cooperation with researchers from Computer Science and Architectural Departments at the Federal University of Paraná and Intelligent CAD and Games Lab of the Pontifical Catholic University of Rio de Janeiro (PUC-Rio).

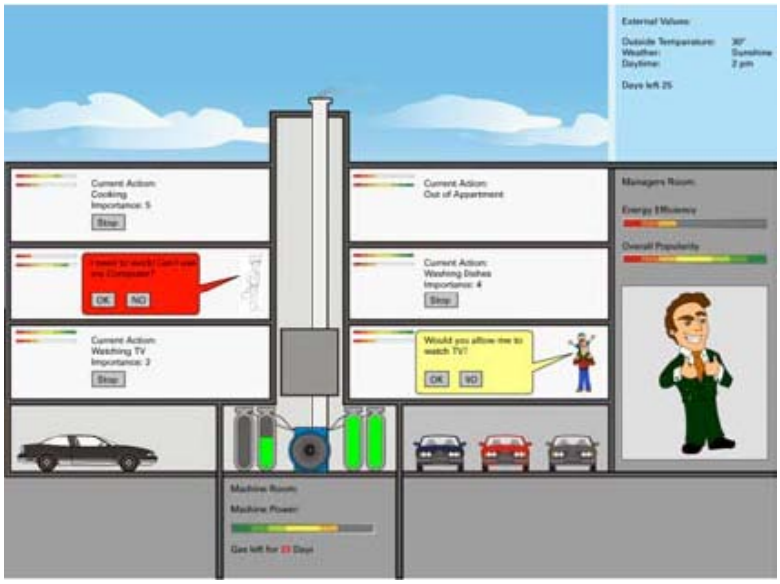

Figure 4 – A View of EEHOUSE Game First Version

In this game, as described by Battaiola (2006) the user assumes the obligations and role of the syndic and must organize the life of the residents in a way that it is possible to consume energy in an efficient manner so that it doesn't result in unnecessary discomfort in the occupants' lives. If the personal discomfort is significant, the syndic loses points in the satisfaction factor/category. If this factor value decreases below a minimum limit, the syndic is fired.The game's first version allows playability only through the syndic. He decides if a resident can use energy to execute a specific activity based upon a priority activity list. The list is dynamic; it can change in function with varying external factors, such as weather, length of day, profession of the residents, as well as health and emotional conditions (BATTAIOLA et al. 2006).

2.2 Group Change

2.2.1 Definition

The paradigm of "group change" understand that, since people work within groups, individual behaviour must be seen, modified or changed according to a group most prevailing practices and norms. The group changes the individual and the individual changes the group in a continuous process of mutual adaptation. Therefore, according to the supporters of this point of view it is useless to concentrate on changing the behaviour of individuals. The focus of change should be on the group level and concentrated on its norms, roles and values (Burnes, 1996).

2.2.2 Case on Group Change: A School for Carpenters in the Amazon Region

In this case study the challenge set for designers was an urgent need to increase the value added by local people in Xapuri, Acre, on wood-based products aiming the local community. EMEC – School of Carpenters, based in Xapuri is an NGO connected to *Cooperazione Italiana* and its main mission is to contribute to the sustainable development of the High Acre through integrated multi-sector projects. This particular project was carried out by Oficina Nomade (Design Firm) in partnership with the NGO Friends of Earth and EMEC. An important innovation here was the fact that every group of students received support to implement a company or cooperative with their classmates (average of 7 students per year) at the end of their learning period at EMEC. Design in this case was strategic to bring more competitiveness to these incubated companies.

This project brought external knowledge but, at the same time, tried to use most of the already existing knowledge among the locals in order to avoid dependence from designer consultants.

Most of the design problems identified during the diagnosis were related to the poor quality of ergonomics and, also, with the excessive amount of time to manufacture these products. Also, very importantly, the design solutions had to consider the possibility of maintenance carried out by the user itself or, alternatively, carpenters with a reduced set of tools.

Figure 5 – The Xapuri Carpenter´s School Shop

Along with the benefit of helping the local economy, enabling local people to have better quality of life, the project brought a severe reduction on the environmental impact of this economical activity. The artisans began to use only wood from managed forests, including waste from FSC - SW COC 1026 certified wood. They use certified wood that did not reach the dimensional standards required for export markets and, due to that, have reduced economical value. CooperFloresta, a wood management cooperative run by a local community (68 families) in Rio Branco, Acre, supplied the wood for this project.

2.3 Systemic Change

2.3.1 Definition

Advocates of this type of change strategy see society as composed of a number of inter-connected sub-systems. The central idea on this strategy is that any change to one part of the system will have an impact on other parts of the system, and, in turn, on its overall performance. This approach for change is based on a method of describing and evaluating sub-systems in a meaningful way for any individual, in order to determine the best pathway to conduct the change so as to improve the overall performance (Broome, 1990; Burnes, 1996; Vollmann, 1996).

2.3.2 Case Study on Systemic Change: BOP at Masisa

This case study reports the use of the Base-of-Pyramid (BOP) business approach at Masisa. This is a vertically integrated forestry company with pine and eucalyptus plantations in Chile, Argentina, Brazil and Venezuela. This company produces wood products for a variety of uses: wood boards, solid wood products such as doors and mouldings, as well as timber, for which it maintains industrial operations in Chile, Argentina, Brazil, Venezuela, Mexico and the United States.

The BOP projects within Masisa comes under its vision of being recognized as a leading industrial group in Latin America , operating in a framework of ethics, eco - efficiency, and social responsibility, that generates economic value and improves our neighbors' and our regions' quality of life. Based on this vision Terranova has established an ambitious goal: by 2010, 12% of its sales will come from "socially inclusive business", by which the company seek to offer its customers opportunities to break the vicious cycle of poverty. To this end, Masisa has created partnerships with more than 300 of its retail outlets (PlacasCentro) licensed in Latin America so as to train

carpenters in producing improved furniture that meets the needs of the poor. Also, in order to create a new sales force for these products it is contracting and training women from low-income segments of society. It is also helping carpenters, with the collaboration of other civil society organizations, to become micro-entrepreneurs and thus participate in the formal economy (Grupo Nueva, 2003).

However, despite such initiatives a critical analysis of the conventional process for designing, producing and distributing furniture on the low-income market has shown that, in order to achieve its BOP goals, Masisa had to enable more equity among all stakeholders throughout the supply chain. The conventional business process generates income and employment quite distant from the areas where low-income people live (see left diagram on the next Figure). Therefore, one of the strategies to implement a socially inclusive business process would require bringing the employment and revenue generation closer to the low-income community that actually buys the furniture (see right diagram on the next Figure).

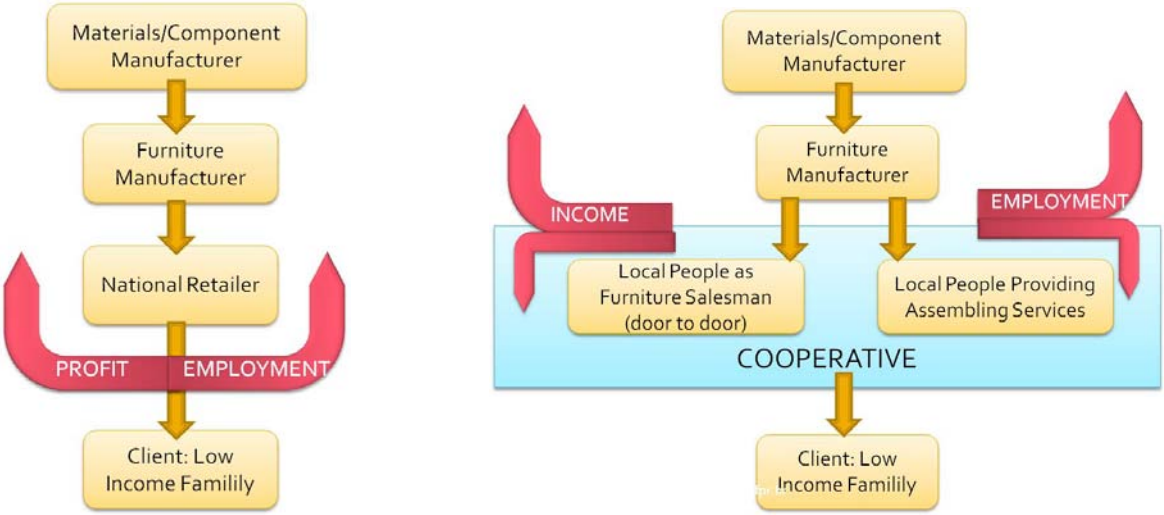

Figure 6 – Conventional business process x New Business Process Under BOP

With the idea of enabling a change in the business process, the present project has aimed the development of products that could be produced, distributed and maintained within the low-income community itself within Masisa BOP strategy. Next figure shows one of these products which fulfills a gap on the furniture market for low income people: a furniture to divide spaces between bedroom and living room or between the kitchen and living room. The product illustrated here is shelf that can be assembled like a Lego and enables its usage on both faces and, very importantly, acoustic insulation.

Figure 7 – The Location of the Product and Some of the Alternatives

The product has been designed in a way that even local producers, using widely available wood processing technologies, would be able to produce and maintain it, thus providing income generation closer to where the low-income families actually live. The scenario for producing and distributing this furniture has considered an undergoing BOP project within Masisa that attempts to

train local people as furniture salesman (door-to-door), emulating other similar marketing approaches such as the one adopted by Avon for its sales force. All wood-based material specified for this furniture follows FSC standards and it was selected within Masisa´s range of products. The product allows the use of accessories to increase its functions and appearance. The current phase of the project includes the analysis of local cooperatives of craftsman in order to include their work as alternative strategies to provide textures and accessories for the product, thus stimulating the local economy. These two channels of product development together with the already existing range of color/textures possibilities offered by MASISA enables a more customized product for each low-income family.

3. From Emergent Change to Planned Change

3.1 Emergent Change

3.1.1 Definition

The emergent approach of change towards sustainability sees change as a continuous, open-ended and unpredictable process of aligning and realigning an organisation to its changing environment. Advocates of emergent change tend to adopt a contingency perspective. For them, it is the environment's uncertainty that makes planned change inappropriate and emergent change more pertinent. Environmental change is so rapid and complex that the initiation and implementation of change in the emergent approach tends to be "bottom-up" rather than "top-down". Supporters of the emergent approach stress four features that either promote or obstruct change, in the case of organizations:

- Organizational or community structure: this can be an important lever for achieving change, but its effectiveness will depend upon the recognition of its informal, as well as its formal, aspects (Burnes, 1996);
- culture: it is important to understand the culture of any organisation or community that is to be changed in order to avoid contradictions and to plan the build up of change (Burnes, 1996);
- Learning channel: involving people in change has the effect of enabling them to challenge existing norms and question established practices that result in commitment towards the change themselves. Organisational or community learning can be precipitated by making impending crises real to everyone in the organisation or encouraging dissatisfaction with the current systems and procedures (Leonard-Barton, 1992; Senge, 1990:150; Argyris, 1993);
- Designer behaviour: designers are expected to operate as facilitators and coaches that bring together and motivate teams and groups to identify the need for change, and the implementation of change. It is necessary to create a shared vision about the future.

The role of designers becomes one of ensuring that the satisfaction of the end user is obtained through the products/systems and that structures, resources and the necessary skills and motivation are in place to initiate, support or consolidate changes towards sustainability.

3.1.2 Case Study on the Emergent Approach: a Jewerly Workshop on a Women´s Prison

This case study shows an initiative that brought work into a women´s jail. On the workshop organized within the jail by a local entrepreneur the women produces collars, earrings and all sorts of jewelry using natural components. With the money they make on this job they are able to help their families outside the jail and, at the same time, increase their employability after their jail time.

Figure 8 – Bringing Employment into Women´s Prison

Important benefits of the Project is elevating the self esteem of the women, reducing stress and helping them to cope with the distance from their children and family. Furthermore, for each three days of work their sentence reduces in one day. Some of the former jailed women now work on shops and workshops outside the prison, with all their employment rights fully respected.

3.1.3 Case Study on an Emergent Approach: The ReciclaJeans Project

Recicla Jeans Project is a good example of an emergent new pattern of designing and producing that supports fundamental social changes. It is project run by Florescer (NGO) where waste from jeans donated by people and companies turn into fashionable new costumes (see photo below). This business went so well that it has now franchising in São Paulo and Belo Horizonte and partnerships with brands such as Eugênia Flori e MOB. In the beginning the project used to sell these recycled jeans solely in Paraisópolis, the second largest chantey town in São Paulo, where it was produced.

The NGO's workshop, built in partnership with the São Paulo city hall and the United Nations Educational, Scientific and Cultural Organization (UNESCO), produces around 1,000 items a month (trousers, jerseys, jackets, skirts, handbags, belts, etc). A conquest of the project was the donation of a space in the shopping mall Shopping D, where the NGO has a shop and the implementation of a shop in Vila Madalena neighborhood, both in the city of São Paulo, where it sells clothes and accessories. The project worked out so well that the products produced by the seamstresses and embroiderers from Paraisópolis have already even been exported to USA, Lebanon, Portugal, Spain and Italy.

Figure 9 – Costume Produced by Recicla Jeans (source: Martins & Castro, 2007)

In 2003 Recicla Jeans began the activity of training craftsman to work on the process of recycling. Thus, it opened the opportunity for increasing the employability of local people and stimulating their entrepreneurship. Currently Recicla Jeans is responsible for generating income to a dozen of families, enabling the NGO to provide health and educational assistance to 75 thousand inhabitants on the chantey town. The project clothes have labels with the "Recicla Jeans"

trademark. Behind the labels is an explanation about the work of the NGO.

3.1.4 Case Study on an Emergent Approach: the Brastemp PSS

This is the case of Brastemp, a brand of Whirlpool. They now are selling “filtered water’ instead of “water-filters”. This could be understood as a PSS since they now manage the life cycle of the product, including changing spare parts, changing filters or recycling the entire product at the end of its life cycle. The company has designed the product to enable the provision of services, including the substitution of parts and other general maintenance activities. Their certification on IECQ – QC 080000 HSPM (management of toxic substances), ISO 9001, ISO 14001 e OHSAS 18001 has helped the implementation of this PSS.

Figure 10 – Moving from Filters of Water to the Service of Water Filtered at Whirlpool

The company has faced the challenge of changing current consumption patterns in Brazil where most people want to be the actual owners of the product. The strategy of selling the PSS to companies, where the burden of changing filters and the opportunity of sharing the service with large amounts of people presents direct economical benefits, appears to be a strategy in use by the company to attract the consumer´s attention to this new consumption model.

An interesting initiative run by this company is the project “Brastemp Independente”: a group of solutions to provide more independence to people with earring, eye or physical disabilities on the use of everyday utilities produced by the company. It consists of a kit with stickers for Braille language and a CD with audio explanation of the product operation and installation, including information aimed to people in wheelchair. The company also provides a special after-sell phone service for their users with earring disabilities.

3.2 Planned Change

3.2.1 Definition

The planned approach views change as essentially a process of moving from one fixed state to another through a series of predictable and pre-planned steps. There are a number of models and techniques for planned management that have been developed within the Organisational Development field. However, the most well known planned change processes emerged from the pioneering work of Kurt Lewin (Lewin, 1958 apud Burnes, 1996) and includes:

- The Action Research model: it usually comprises a senior manager, people from the area where the change is to take place, and a change agent (e.g. design consultant). Diagnosis and redefinition of the situation and of the problem under consideration is carried out interactively by a team after careful consideration of the entire system. The role of the change agent in this team will vary from being the generator of a crisis, in order to drive change, to simply helping fine-tuning existing changes (Burnes, 1996; Vollmann, 1996). It

maybe necessary to build multiple scenarios when establishing the desired changes of any situation;

- The Three-Step model: this method provides a general framework for understanding the process of change. Other writers have expanded the number of steps or phases in this model, but the essence remains the same (Leonard-Barton, 1992; Senge, 1990:150; Argyris, 1993). In general terms, it involves the following steps (Burnes, 1996):
- Unfreezing the present level: this usually involves reducing those forces that maintain the present behaviour (e.g. confrontation meeting). The essence of this step is to enable those concerned to become convinced of the need for change;
- Moving to the new level: having analysed the present situation, identified alternatives and selected the most appropriate, action is then necessary to achieve the desirable state;
- Re-freezing the new level: this phase seeks to stabilise consumption at a new state of equilibrium in order to ensure that the new ways of consumption are relatively safe from regression. Supporting mechanisms that positively reinforce the new ways of consuming are the usual ways for achieving objectives.

3.2.2 Case on Planned Change – Pernambuco Imaginary Project

In the Northeast of Brazil a large percentage of the population as the only option for income the exercise of manual and/or arts and crafts activities. According to Cavalcanti et al. (2007) this background has been aggravated by the ineffectiveness of specific public policies towards the production of handicrafts (arts and crafts, and popular art) and by the total lack of liaison between communities producing such material, and seed money agencies and entities (whether governmental or non-governmental). Brazilian arts and crafts remain culturally marginalized, allied to obsolete models of productive organization, contributing to large number of enormously talented and potently creative craftspeople and folk artists being shackled to severe poverty. Many of them have been obliged to abandon their activities to seek alternative sources of income in more developed regions, and thus they form a population of rural migrant workers who do not even manage to build other opportunities for a decent life in the large cities (CAVALCANTI et al., 2007).

It was with the aim of changing such situation that, starting in 2003, this project was carried out within the municipality of Cabo de Santo Agostinho, situated on the South coast of Pernambuco, Brazil. This was called Pernambuco Imaginary Project and it was led by researchers from the Pernambuco Federal University. Craftwork in ceramics in Cabo dates back to the time of the sugar-cane plantations, a period at which the production of bricks and tiles was only targeted on consumption by the factory itself and on homes for its workers. With the passage of time and in each succeeding generation, these potteries, where ceramics were produced, became independent in order to produce and sell utilitarian artifacts such as pots, pans and drinking water containers to the population in the vicinity. Such a tradition was passed down from grandparents to parents, and from them to their children (CAVALCANTI et al., 2007).

The Pernambuco Imaginary Project carried out its initial activities with a group of potters. In the municipality there are around 25 productive units but the current position is that only ten individual producers in the area known as Mauriti make a living exclusively from this activity. A full diagnosis, assembled from observations of the technicians and craftspeople involved, has permitted a better understanding of the relationship between the flow of production, the management of the space, the development of the products (see next Figure), the use of the natural resources and the commercialization of the pieces. The project involved training and the strengthening of groups, by encouraging the construction of collective agreements and the quest for autonomy. Action favored the recognition and training of community leaders, improvement of self-esteem by raising the awareness of the men and women craftspeople to the value of their work (CAVALCANTI et al., 2007).

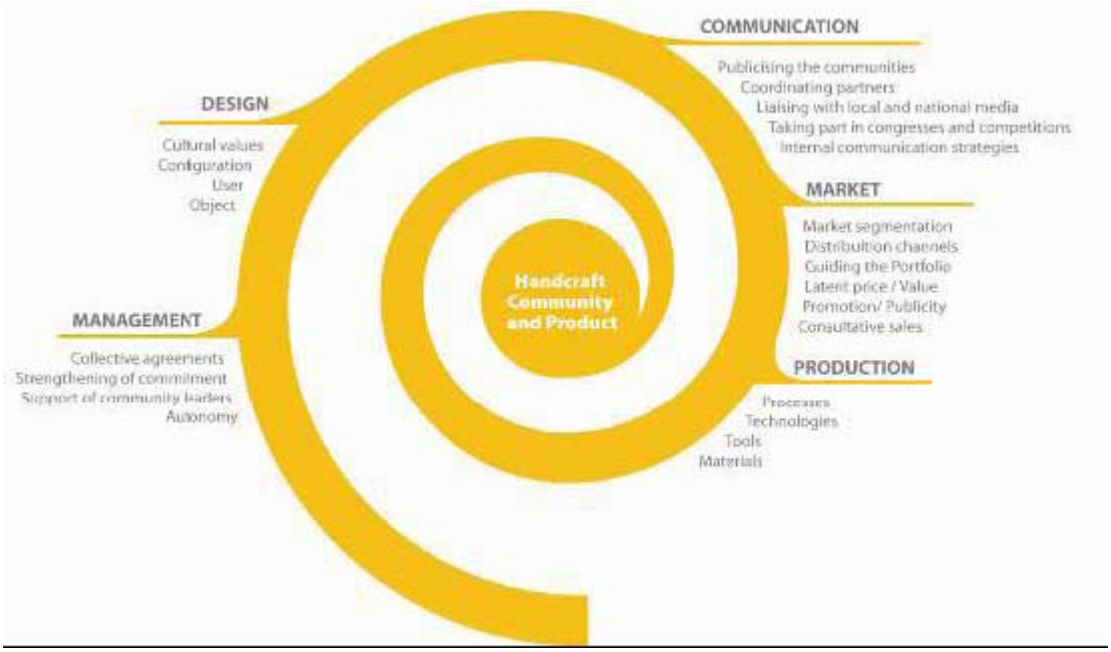

Figure 11 – Overall View of the Methodology at the Pernambuco Imaginary Project

Based on the existing modes of production and respecting the communities' rhythm of life, the Pernambuco Imaginary sought to optimize productive processes, improving working conditions and the sustainable use of natural resources. Introducing new technologies and tools have guaranteed the quality of craftsmanship and aggregates value to the product. Each product developed on the project focused on valuing popular knowledge, recognizing traditions, skills and the proper use of materials. As a result, designer and craftsman create product lines in which forms, textures and colors reflect the social and cultural values of the communities. The excellence of the product and its compatibility with market demands makes the sustainability of the activity possible (see next Figure) (CAVALCANTI et al., 2007).

Figure 12 – Example of Products Developed Through the Pernambuco Imaginary Project

For the purposes of generating information capable of raising the awareness and mobilizing public opinion to the value of craftwork and the rights of their creators, the Pernambuco Imaginary promoted strategic communication actions. For each of the project's partner communities, the design team has devised a visual identity which reaffirmed the history, the culture and the sense of belonging to a group. This was done by printing a seal of origin and quality on all that is produced by the community.

3 2.3 Case on Planned Change: An Incubator of Cooperatives at UFPR

Universities have been involved on supporting the organization of the bottom up social movement in Brazil through incubators of cooperatives, helping the creation of new jobs for groups

of people with low income. Such organizations focus on income generation and social inclusiveness by transferring technical and scientific know-how produced within the university (Penin, Chiara, 2005). The implementation of such incubators within the university makes it easier to bring together social forces and, also, promotes more competences on future graduates on the promotion of social changes. According to Almeida (2005) there are currently 237 incubators in Brazil, of which 107 are incubators of technology based companies.

At the Federal University of Paraná, the Cooperative Incubator is an outreach program that started in 1999. As the next figure illustrates the process of incubating a cooperative starts from a deep understanding of the community. That is achieved through activities such as a social-cultural diagnose, an assessment of the economical potential and a workshop on solidarity economy. The phase of incubation itself involves training/coaching on issues such as cooperativism, law and management of cooperatives, on accounting, financial management and entrepreneurship. Also, during this stage the university provide consultancy on administration, law, accounting and economics

Figure 13 – The process of incubating a cooperative

At this incubator there is no on-the-shelf solution: the problem solving is carried out in partnership with the community, with the aim of developing capability of self-organization. Currently the team involves academics from Psicology, Geography, Economics, Social Sciences, Administration, Law and others.

4. Discussion

Brazil is often painted abroad by means of its darkest colors: urban violence, widespread poverty, poor human rights record and so on. Struggle to survive and lack of government efficiency and effectiveness result on a society where norms and regulations are often ignored (or creatively improved). Due to the lack of money, a large portion of its society has learnt to live with fewer resources, paradoxically surrounded by an abundance of resources. Innovative solutions in such environment often emerge from pure necessity rather than careful planning. Indeed, more recently an increase on the education levels, political awareness and information access has induced a widespread of locally-based social initiatives that in many cases represent truly innovative social changes towards sustainable consumption and production.

Based on this context, this article presents emblematic case studies gathered in Brazil, trying to understand their underlying strategies to radically change current patterns of consumption and production. Next figure shows their connection with the theoretical structure adopted in this paper to discuss change towards sustainability.

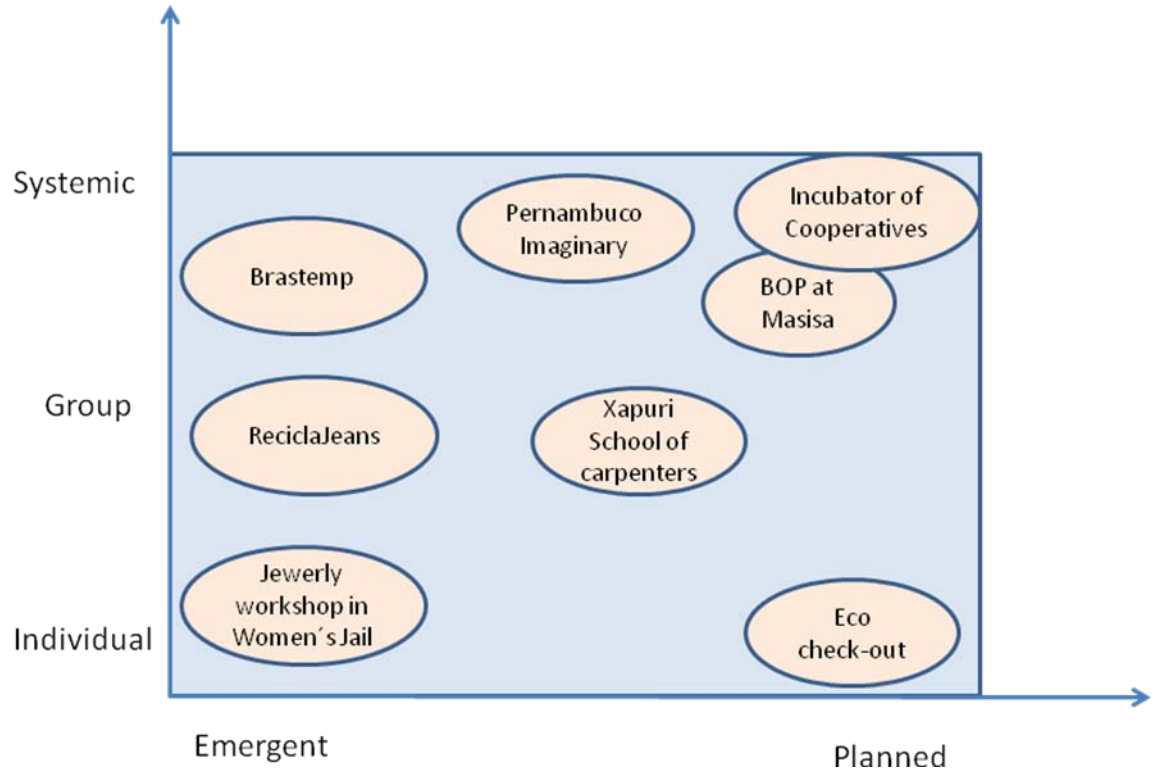

Figure 14 – Set of Case Studies and their Connection with General Change Strategies

Some underlying characteristics of the Brazilian culture need to be addressed in order to understand these case studies. Entrepeneurship, skill to deal with uncertainty and flexibility to change consumer and production patterns are characteristics of Brazilian people that are helping to speed up the change towards sustainability. Past experience on dealing with high inflation has contribute to this cultural attributes. Entrepreneurship, in particular, is a characteristic required from the poor population in this region on a daily basis in order to guarantee their survival. Indeed, according to the Global Entrepreneurship Monitor (REYNOLDS et al. 2001) Brazil has entrepreneurial activity equal to that of the United States. However, a higher proportion of entrepreneurs in the country are involved through necessity rather than opportunity.

According to the GreenIndex (2007) Brazil's consumers are tied with India's as the highest-ranked on the 14-country index of environmentally sustainable behavior[12]. Brazilian consumers earn higher Greendex scores than all others for housing. That is driven by small residence size as measured by number of rooms per household (96% have four rooms or fewer in their homes), the least use of home heating (found in only 9% of homes), relatively widespread use of on-demand water heaters (rather than tank heaters), and wide penetration of renewable electricity (generated from biofuels/biomass in this case). Brazilian consumers — like their counterparts in Mexico and Australia — overwhelmingly wash laundry in cold water, and they are far above average on minimizing their use of fresh water (GREENINDEX, 2007). Obviously, this presents a distorted view of sustainability since environmental performance in this case do not bring along economical and social bennefits.

A cinical analysis can surely put poverty as a driver for more sustainable life styles. It has induced social practices in Brazil related to housing, for instance, that would otherwise be difficult to implement on a planned (but artificial) setting. For instance, whilst in other parts of the world people talk about co-housing as an innovative practice for achieving sustainability, it is in practice within Brazilian chanty towns for a long time. The houses are diminute, requiring a more intensive share of common facilities and more intense interaction with their neighboroud. Activities such as

[12] The GreenIndex Survey in 2007 included the following countries: Australia, China, India, Japan, Canada, United States, Mexico, Brazil, France, Germany, Hungary, Russia, Spain, United Kingdom

cooking for the community or helping out with the child-care are regular activities in this communities.

Brazilian consumers are far below average on their ownership of vehicles and likelihood to drive alone in a vehicle to their daily destinations. The GreenIndex survey shows that they are much more likely than most others to walk, bike, take public transportation, own a fuel-efficient vehicle and drive compact cars. However, food is the one area where Brazilian consumers do not rank particularly well (10th out of 14). While they are above average in their consumption of locally grown foods, as they frequently consume beef: 16% daily, 62% several times a week or more. Brazilians are also far above average in their consumption of convenient (prepared/packaged/processed) foods, and 35% say they drink bottled water daily, about average for all countries surveyed and on par with U.S. consumers. Also, Brazilian consumers are the most likely to prefere green products and reject environmentally unfriendly products (GREENINDEX, 2007).

Brazil as well as the entire South American continent present large environmental, economical and social changes that in many instances replicate mistakes that have already being made by developed nations in the past. The challenge is to cope with the urge for consumption amongst the poorest people, moving the focus from democratization of consumption to democratization of satisfaction. There is no single answer for this challenge but learning from successful experiences in Brazil and elsewhere can help bringing light to other parts of the world and even to other parts of Brazil itself. Next sections present some of these cases.

Fortunately, cases on planned and emergent changes on the direction of sustainability in Brazil are expanding in numbers, involving since large corporations until self-employed workers operating in their own home. On many of these cases the change is so positive that the theme for design could be more about “supporting-the-change” or “disseminating-the-change” than actually change the change. However, most design research groups in Brazil working on the field of sustainability present fragmented and unconnected actions that are relatively low profile and with relatively low impact. Hence, there is clearly a need for a general framework for action that put together the (fragmented and unconnected) existing actions and provides shelter for new actions.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Calling for "She Ji":
Rethinking and Changing the Changes in China

LOU Yongqi [13]

Abstract

This paper gives special attention to China's traditional "She Ji (design)" system which almost been replaced by western oriented modern design disciplines for century. The advantages of "She Ji" notion have become increasingly obvious according to the criteria of sustainability. The considering of sustainable develop provide a pause for rethink, revaluate, and redesign many phases and changes in China. The re-initiation of the "SheJi" notion can offer new philosophies and methodologies for Chinese design, design education and design research. The ways in which design can play important roles in culturally conscious and be an agent for sustainability in China is also explored with cases in a microscopic viewpoint.

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1. Establishing a strategy: China's traditional "She Ji (design)" notion

The original meaning of Chinese word "She Ji (design)" was "to establish a strategy"; it originated from military affairs (Yang, YuFu, 1997, 3). "She Ji (design)" was dominated by two different classes in ancient China, the literati and the artisans. The former mainly used "She Ji" on the level of 'Tao' (Philosophy, ideology), focusing on military, political, social and cultural purposes, and the latter mainly used design on the level of 'QI' (Materiality), covering the fields of technique, arts and crafts[14].

This dual-structure of the 'TAO' and 'QI' integrated various aspects of society, although the communication between the two levels have barely been examined[15]. Systems such as "She Ji (design)" have been running successfully in China for thousands of years.

2. From "SheJi" to Design: development, Criticism and opportunities of Chinese cotemporary design

The military failures of the Opium War became the fuse to the social and cultural revolutions. A century of turbulence brought about the crash of the traditional culture and social structures. Westernization and globalization became the mainstream of all kinds of changes, especially since the reform and opening started in 1976. The history of Chinese modern design education and practice shares the patterns of Chinese society.

From "Sheji" to design, this phrase summed up the developing processes of China's modern design education and practice. This paper lists some of the most important criticisms and opportunities for Chinese design as follows:

Excessive Westernization

As a part of the whole higher education system, the development of design education in China is also a process of compromise in line with The West, while adhering to traditional culture. The slogan of "Chinese Learning as the Fundamental Structure, Western Learning for Practical Use"[16], was widely disseminated for a century in China. The development of the latter however, is far more advanced than the former.

The introduction and dissemination of modern Western design education and practice theories, such as those derived from "The Beaux-Arts" and "The Bauhaus" provided a shortcut to the development of design education and practice in China[17] (Gu, 2007). Consequently, the

14 For example, the capitals of the empire were always recorded been designed by the Prime Minister or even the emperor himself. ChangAn (Xian) City, capital city of Han Dynasty (206 BC – 220 AD), was recorded been designed by Xiao He, the first Prime Minister in Han Dynasty. Later it was redesigned by Yuwen Kai, the Prime Minister in Sui Dynasty (581 AD – 618 AD), been the capital of Sui & Tang Dynasty (618 AD – 907 AD). Also, the design concept of most of the Chinese Gardens always came from literati while the technical work and detail were finished by the craftsmen. The villages and rural areas were always designed by Fengshui Master.

15 In traditional Chinese value system, the distinction of 'TAO' and 'QI' forms a Social consensus that the knowledge of the humanities is much more important than the technical ones. The former was mainly being spread and inherited by text and books and latter mainly being spread and inherited by personal example as well as verbal instruction. The policy of 'Strengthening Agriculture and Inhibiting Commerce' lasted for two thousands of years also inhibited the development of industries which is the soil for the emergence and development of modern design disciplines.

16 At the end of Qing dynasty when modern Chinese education ideologies were undergoing changes from the old to the new, some literati advocated learning from the west and attaching importance to education and personnel training.

17 As early as in 1930s, western Arts and Crafts education system began to influence China by the Chinese students studied in USA, France, Japan and other countries. The Beaux-Arts education became the mainstream in architecture design education from1920s and lasted for 50 years. In Shanghai, Bauhaus system architecture and design education in

possibilities of developing China's own design theory and way of practice are limited.

Traditional "SheJi" notion has been discarded, as it was not clear enough according to the standards of modern discipline, and also too soft compared to the Western ones. At the same time, the craftsmen along with their skills were also seriously marginalized due to a lack of an adequate voice. This situation became more and more accentuated in many aspects, during the changes of lifestyle and economic structures.

Driven by the market rather than driving the market.

The rapid development in the economy throughout the past thirty years provides enormous opportunities for the development of Chinese design. The market's growing demand of designers consequently has lead to a boom of Art and Design schools. At present, China has more than one thousand art & design schools. This alarming number is the result of both the market demand and the "industrialization of higher education," (Wang, 2008).The market-driven design education is obvious, but the whole design industry lacks the preparation and ability to take the initiative to drive the economic market.

Large numbers, high speed, low payment terms, lack of strategic thinking and consumer knowledge are common characteristics of most Chinese design practices. Rem Koolhaas once said that a Chinese architect is as efficient as 2500 European architects, as they have designed the largest number of building complexes in the world within the shortest time and at the lowest cost. The practice of choosing quantity over quality, skills over ideology, and style over substance, is quite common in both design practice and design education.

The role of design is still limited

The boom of Chinese design education and practice is closely related to economic development. However, if not for the weakness in mechanism, design could play a more active role in a broader socio-economic and cultural stage; the importance of design has not been fully exploited. Social, economic, political and ecological awareness in design education and practice are rare and outdated. Some design areas are still underdeveloped in China, such as strategic design, branding, design management, human centered design, sustainable design etc. This is mainly because the effect of design can only be visible in the long-term and not directly in these areas. This situation will not change unless the role of design is expanded from a kind of tool to a strategy or policy. To achieve this, design discipline needs to adopt a more open attitude, participate in socio-economic innovation, and integrate itself into the Chinese political and social system.

Sustainable Design consideration: a pause for steering towards a better future

Today, sustainable development may be one of the few universal ethics in the world. More and more Chinese people find that the rapid changes have led their country in the opposite direction of sustainability. We Chinese have to admit in shame that our ancestors lived a far more sustainable life style than we do today[18].

The whole world today depends on sustainable solutions for its salvation, and China is no exception. Sustainability has already become new criteria for re-evaluating the changes that are happening or have happened in our life and world. We need to pause and rethink before taking further steps: to rethink the rationality of modern industrial civilization; to rethink and compare the present physical spaces, social-culture and life styles with what they used to be; to rethink the positions, values, trends and possible social responsibilities of design education, design practice and design research.

An International design platform is established

Now, the whole world is focused on China. The big market together with the great platform for

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Tongji University (including St. John's University) was booming since 1940s. Central Academy of Art and Crafts in Beijing, the first technology-based Institute of Art and Crafts, was established in 1956, it's major covered dyeing art, ceramics and other applied decorative arts.

18 In traditional Chinese ideology, human and nature have always been regarded as a whole; the human body and the outside world are both complicated systems sharing many common characteristics. This kind of understanding together with respect and love of nature leads to a world of balance and harmony (the Chinese meaning of "sustainable"). The traditional philosophy, ways of thinking and life styles which were once rashly abandoned, may exactly meet the needs of sustainable development.

design practice and research has attracted designers and researchers all over the world. Never before have Chinese people felt the world so close. Various design ideas and experimental practices have appeared on the stage in China simultaneously, their characteristics and how they are defined have become particularly clear. This undoubtedly provides a higher and boarder platform for the development of Chinese design disciplines at a lower cost and higher speed. The integration of international and localization is can also to be achieved more easily.

The awakening of national culture consciousness

In this era of globalization, Far Eastern designers are duty-bound to put forward their views as critical regionalists （Frampton, 1992）. A large number of cases indicate that China's design community has adopted much more open thinking, in order to explore the route of original Chinese innovation. This quest for a "cultural consciousness" indicates the opportunity for original Chinese design thinking to flourish. Thinking Chinese and acting international will be the character of most Chinese designers of new generations, based on their own "life world" (Harbermas,1987).

3. Calling for "Sheji": Why and How?

The advantages of "She Ji" notion

In today's point of view, the core of the Chinese "SheJi" notion can be described as follows:

*Soft definition: ambiguity but higher applicability, immaterial design rather than physical design,

*Systemic strategy: synthesis of the micro and the macro level, dual-structure of "Tao" and "Qi",

* Involvement with decision makers: Collaborative work with top-down mode, integration with the social system

The softer Chinese "SheJi" concept extended the application field for design, and it also coincides with certain tendencies in today's design circles, such as 'vision', 'social', 'system' or 'strategic' design, etc. (Valtonen, Anna, 2007, 308) In John Heskett's notion "Design is to design a design that will produce a design" (Heskett, 2002, 3), we can easily find a meeting point between the East and the West.

According to the "SheJi (design)" notion, the product of "SheJi (design)" is a strategy. To realize a strategy, a systematic approach is necessary. It will cover the field of "Tao" and "Qi". At the cultural and socio-economic level, the dual-structure of "SheJi (design)" system provides a platform to combine many aspects of traditional culture and social-economic life together[19].

In the highly organized and government-driven society of China, the renaissance of traditional "SheJi" concept can easily gain support from the ancestral existing social structures and decision-making system to push China's social development to a more sustainable direction. The interpretation based on traditional culture also makes this notion much more open and acceptable for the society.

The advantages of China's "SheJi" notion have become increasingly obvious in line with to the criteria of sustainability. In China, re-initiation of the notion of "SheJi" has positive significance, but it does not mean that Chinese design will go in the opposite direction from the rest of the world. It is not a kind of restoration, but a kind of renaissance. Calling for "SheJi" also means that a design strategy in China can be designed.

Introduction of some cases: Visions of design in China

According to the notion of "SheJi", Chinese design move in the following directions:

* Integrate with the top-down social and political pattern;

* Active intervention in political, economical, social and cultural field;

* Use of design as strategic and systematic tools to achieve Chinese social, economic and cultural sustainability;

* Focus on the folk wisdom with a sustainable lifestyle;

* Redesign the Chinese contemporary life-style without losing its cultural essence ;

19 China's ancient strategy books have been widely used in the micro-economics and business management, and involve in people's daily life. It's easy to find a mass of such kind of books in the bookstore of every Chinese airport.

This paper will focus on some projects in one design school, CAUP Tongji University, and provide a microscopic vision on what is happening and will happen in Chinese design, design education and design research.

·Case 1: Urban leaders' course in CAUP-Tongji.

China has a long tradition of top-down social and political systems. If design wants to play an important role, either designers need to be at the decision makers' level or the decision makers need to realize the importance of design. Twenty years ago, CAUP of Tongji University established the Training Centre of Urban Leaders together with the Ministry of Construction of P.R.China. The centre provided a kind of short term course for mayors, directors of urban planning bureau or construction bureau all over the country. All together, 20,000 official students have graduated. From 2008 on, we have begun to teach students courses on design innovation. We communicate with decision makers in the classroom and let them understand design to help promote the role of design in local areas.

·Case 2: GreenChain-Tongji

GREENCHAIN (GREENCHAIN Art & Design Consulting Enterprise Alliance) is an alliance between Tongji University and enterprise focusing on design education and sustainable design research. It was established at the end of 2007 and is supported by the Tongji University and the Shanghai Creative Industry Center[20]. It was established for integrating business innovation with design education and research. Now, it has 14 members including manufacturing, software, service, design, and consulting companies, such as China Telecom, S-Point Design, China Bridge, AutoDesk (USA), Herman Miller (USA), American Greetings (USA), Electrolux (Sweden), CPH Design (Denmark), Silver lining (UK) etc. It provides an inter-disciplinary platform for sharing ideas and resources within the alliance, but also promotes the communications and collaborations between industries, education, research, government and commerce.

·Case 3: Eco-Community construction of China new countryside on Chongming Island[21]

Tongji University together with Stanford University, California Polytechnic State University, Yale University and China-US Center for Sustainable Development, are now working on a research project on Chongming Island. The partners will work together to design and build a pilot version of a model sustainable rural community on Chongming Island. It is envisioned that this community will be a fully-functioning, net zero CO^2 emission community designed according to cradle-to-cradle principles that meet the economic and social needs of the rural residents at or below current costs for rural community development. The scope of the project includes a holistic design of the villager's local economy, their individual and community dwellings, transportation systems, and all associated subsystems. The project goals will be achieved by collaborating in teams ideally consisting of engineering, social science, science, business, agricultural, architectural and design experts from both China and US partners. How design can improve the local development in a sustainable way is one of the most important research topics for this project.

·Case 4: Etopian[22]

Etopian is a newly established company by a group of young designers from different areas whose aim is to establish a revolutionary system for housing industry in the criteria. The core of this system is the industrial assembly housing system based on web2.0[23]. The system attempts to achieve the integration of the industrial chain and social resources. Based on web 2.0 technology

20 Shanghai Creative Industry Center is a semi-official specialized organization in promoting the development of Shanghai's creative industries. The center's mission is to coordinate resources, formulate development targets and strategies, strengthen the guidance, construct a platform, promote the assembly, and establish a system, thus gradually forming a modern industry structure supported by the individual creative industry enterprises and clusters on the platform of "Shanghai Centre of Creative Industry", and driving the overall development of Shanghai creative industry. See http://www.scic.gov.cn/english/introduction/index.htm

21 Chongming Island is located in north of Shanghai. With an area of 1041 km², it is the third largest island in the People's Republic of China after Hainan. With the construction of a trans-Yangtze tunnel, the island is expected to be developed as the first Eco-Island in China.

22 www.etopia.cn

23 Industrial assembly housing system is not a new concept. But in history, it fell to success and get popular because of such kinds of houses were always thought as low-grade, monotonous and lack of personality, and related with Slum. But in eras of web2.0, there's a clear vision that shortages above can be avoided.

and platform, personalized needs can be realized. Etopian housing system is based on the entire life cycle. It integrates products, services and market with the intensive use of resources. Different kinds of designers, suppliers of construction materials and home appliances, contractors, and the customers are integrated in this system. The system will be presented at one of the villages in the earthquake area in China's Sichuan Province. The first experimental house will be donated to local areas.

·Case 5: Folk artists and 'Grass root' creation

In Chinese traditional history, Tao and Qi belong to two different classes. The dialogue in between was always inadequate. Although the number of art and design schools is booming, many traditional arts and crafts have vanished or face the crisis of vanishing. Some universities in China are acting to protect such kind of immaterial cultural heritage. Together with World Heritage Institute of Training and Research-Asia and Pacific[24], folk artists are invited to Tongji University to participate in the design education. Some professors in Tongji are also working on the long term research on Chinese 'grass root' wisdom and creation for sustainability. Such kind of design education and research programs provide a platform to start conversations in wide ranges of society.

4. Epilogue

China is experiencing the most rapid change in the world, and at the same time. China may also be the most ideal place to realize any strategies for change. We need to "She (set up)" a right and good "Ji (vision and strategy)" for our future, enables people live as they like, and in a sustainable way (Manzini, 2006). It's not only for the design discipline itself but also for all of humanity. To achieve this ideal, not only is science and technology needed at a physical level, but ethics and culture are also needed at the systemic and strategic level.

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24 World Heritage Institute of Training and Research-Asia and Pacific (UNESCO) is hosted by Tongji University. It's specialized in the field of cultural heritage conservation in Asia and Pacific. See http://www.whitr-ap.org

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Asian view of sustainable future

The big rapid change going on in Asia is an unique opportunity for steering the region toward a sustainable path.

Fumikazu Masuda[25]

Abstract

In order to explain possibilities and evidences of “Changing the Change”, the paper will start from the historical background of Japanese craftsmanship and will arrive to outline the on-going tendencies in eco-design, and in the emerging consciousness that eco-design is not just to improve products, but is the actualization of sustainable society.

As conclusion, the paper will propose the idea that, although Asian societies certainly are going through a radical change, there are also unchanging cultural aspects. One of this is flexibility in change. Historically, both natural and cultural sustainability had been secured through this flexibility and hopefully this system will be able to work out for the future to come

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1. Introduction

First of all, in order to explain possibilities and evidences of “Changing the Change”, the following is the tendency of changes concerning the Asian designs, through a Japanese eye.

Before considering the designs in Japan, I think I should mention the historical background behind it. It's after 1950's since so-called the specialty of designs or the field of the professional occupation had established.

In Japan, we have a long historical background on the traditional crafts which had been cultivated by professional craftsman who have excellent skills and manufacturing technology, utilizing various materials. Even though many other countries from all over the world also have excellent handicrafts, yet the characteristics of traditional handicrafts of Japan lie in the continuation of practical use of the products.

According to the Japanese law, which is related to the promotion of traditional handicrafts industry, appointed by the Minister of Economic Planning Agency, such as textiles, bamboo work, dyeing, woodwork, lacquered ware, metalwork, ceramics, stonework and so on, over 210 kinds of products are registered as traditional handiwork. They are required to be created in the same area with the same materials and technology for, at least one hundred years. Today they are still utilized by people as daily products. The foundation of major traditional handiworks were establish in Edo Era, the era from 17th to 19th century, which produced the most mature culture in Japanese history, and at the same time, the whole country were said to be one of the most unprecedented sustainable society throughout the world.

Another characteristic of Japanese traditional handicrafts lie in its anonymousness. They put names of the places of the production but it's rare to put the artisans’ name on the product. This continuation and the namelessness is passed on today. This fact tells that design in this country has been on a demand side rather than on supply side.

Fig. 1: The traditional Japanese paper combined with the most advanced paper molding technique

2. Trends of change in Japanese design

In the middle of rapid industrialization in 5O's, designers' profession in Japan seems to be classified into a part of product development and sales promotion. And at the same time, the majority were hired and paid salaries by major industries. Currently, majority of Japanese

designers are still employees. They work for the Brand Company and merchandise to compete one another. Ever since the recession in 90's, the tempo for the Japanese enterprises to expand marketing scales and development of products are descending, and a huge number of designers (i.e. automobile makers or electric household appliances companies, which probably own 200～300 people, or at the most over 500 people) are forced to change their positions and the average scale of the design section is getting smaller.

The values on the products for consumers are shifting. Simply convenient products or good looking or unique products seem to be less attractive. Thus, consumers' demands in buying products are changing. The old way of thinking that design is a synonym for appearance is no longer the mainstream. The marketing values are rapidly changing with diversity, instead. Some look for quality and rare products even if it's expensive, and on the contrary, others look for something plain and inexpensive. There are consumers who concern for environmental aspects and social justice, while other people concern much about their own merit.

While some designers make an objection to the namelessness and go into new business perceiving the design as a piece of work, others find themselves feel more comfortable standing on a social ground, where some important new themes of design are arising. There are concerns about the aged, the disabled and other people, dealing with various conditions, which is called universal design or inclusive design. Furthermore, by focusing on children as new generation to come, so-called kid's design would lead to solutions by making the object of design more clear. And there is eco-design that put more emphasis on the environmental aspects and to enhance environmental efficiency by saving resources and energy consumption.

Fig. 2: An example of universal design; a pair of chopsticks for the elderly and disabled users

At the bottom of these seemingly opposing movement regarding design, there must be a reconsideration and criticism toward the contemporary civilization, such as mass production, mass consumption, and mass waste based on social-economic principle.

But, for instance, some of the newly developed products in the name of universal design are producing hit merchandise, by creating new needs for those who were not in need of things as such before then. Also, eco-design brings about merit for the consumers; fuel-efficiency, less electric consumption, saving water or compact and light-weight product. Meantime, it contributes for the makers by high productivity and cutting off the cost or creating a good brand image. It's been encouraging marketing competition and established win-win relationship between producers and the market for the past 10 years and made a remarkable progress.

Since 1999, the eco-products expo in Tokyo has expanded its scales each year. For the last year, more than 600 enterprises and groups took a part and 165,000 people were visiting in three days. I have been picking up one product each on the cover of Nikkei Ecology monthly magazine and writing about it’s environmental quality. I have had no problem, so far, in finding out over a houndred of so-called eco-products during this nine years.

However, the fact is the more those design movement turns out to be a success; ironically it increased more consumption and more environmental impacts such as global-warming gas exhaustion instead of bringing out sustainable social condition. Comparing to 1990, the exhaustion of CO2 from each electric house-hold appliances had been improved up to 50% less, yet as people buy more house-hold appliances and use them more, the total amounts of CO2 exhaustion's been increasing over 30% for the last 10 years.

This typical rebound phenomena is due to the economic growth without decoupling resource consumption and also owing to the lack of awareness of consumers accepting the companies' campaign without doubt. We have to capture this trend of people's objective of interest changing from something new to something good for environment and change the direction of the change from better consumption to better way of life.

The crucial theme of design competition held in Japan last year was environment and sustainability and I myself had related with 6 of them as a judge. This fact shows what designers are more interesed in this area, these days. After 50 years of Japanese Good Design Awards' history, they decided to replace all different special prizes with Sustainable Design Awards.

G8 SUMMIT will be held in Hokkaido, Japan from July 7th to 9th.The main theme is global environmental problems, focusing especially on the global warming. The chairman, our Prime Minister Yasuo Fukuda will declare the decrease of CO2 exhaustion up to 60-80% by the year 2050. It seems that eco-something, like eco-innovation, eco-fund, eco-products and eco-design is a vogue word today in Japan.

But the destination of eco-design or design for sustainability is not just to improve products. The realization of sustainable society is what we've been aiming at. It is already proven that we cannot access to sustainable path by buying and consuming more eco-designed products. I, as a designer, believe that it is our mission to construct images or, blue prints, of possible sustainable society while sharing the sympathy and reaching an agreement with current society on our common future, and draw a concrete road map to reach out for the destination.

第2回サステナブルデザイン国際会議
Destination 2025
デスティネーション2007-2025
The 2nd International Conference of Design for Sustainability

Fig. 3: The second international design conference of sustainable design was held at Shirakawago

For this purpose of drawing the images of sustainable society; We had held international conferences and workshops twice; "Destination 2026" in 2006 and "Destination 2025" in 2007. More than 200 participants for the first conference held in Tokyo were from various professional areas including design, architecture, business, NPO and so on. The second conference took place in snow-covered mountain area called Shirakawa-go, a well-known world's cultural and natural heritage. Over 120 people had joined the 3 days workshop, and about half of them were current designers and design managers from industries. Many students and young designers also joined in and they were seriously making debate with the veterans.

Just about recently, Japanese government and the industries are going through the paradigm shift of civilization. The designers must function with new values of life as a steering role. The big changing era that tends to put more priority on the social benefits rather than that of the enterprises is a chance for Changing peoples' mind and behavior.

Although it is quite doubtful if the majority of Japanese is aware of the fact that the coming decades must be a very tough era for our economy and so is true for the life of ourselves, we are about to face a national crisis. Because, Japan is a densely populated country relying on the imports concerning foods and most of natural resources like petroleum oils and it seems that they are not available anymore in the near future. Taking this into account, if Japan could tranform itself to be a model of sustainable society, it will definitely be a hope for Asian countries as well as other countries throughout the world.

3. Trends of change in Asian design

Now I'd like to talk about other Asian countries regarding the design situation. Both in China and India, massive economic growth is on the rise. It is obvious that these two gigantic countries have the keys to actualize sustainability in cooperation with other Asian countries and the rest of the world. Korea, Taiwan, Hong Kong and Singapore are now very active in terms of design.

Industrial designs of Korean automobile and electric products are renowned both in Europe and USA and the brands are establishing a high position in the International market. Also in Asia, Korean companies and their design are making a crucial influence. But as for sustainability related discussions, it seems to be rather quiet while the focus is placed on the relationships between industry and the marketing role of design. But the reality is that there are designers who are enthusiastic for eco-design and sustainable design. Chonggyecheon project is a good example showing their power of changing the shape of the city environment.

Taiwan has been working on green design with zeal for the last 10 years. They have been working on the issue also in the education field. I visited Taiwan every year for the past few years and I did seminars and workshops regarding eco-design at several different cities. Thus, their awareness on the environmental issues are high, yet as the Taiwanese companies are making their way to the Chinese market, the eagerness seem to be rather stagnant. But I hope the historical name of this island “Formosa”, or a beautiful island in Portuguese, indicates their sustainable future.

Hong Kong has a strong influence from U.K. and other European design education in historical terms. Today they try to establish a strong economical relations mainland China, while they keep their own identity and they work hard on the development of design in the industrial, governmental and educational level. They are preparing for the latest educational program dealing with eco-design and sustainable design. On the other hand, H.K. is playing a role of leading consuming market in Asia. They have conflict to be solved.

Singapore has similar characteristics as Hong Kong. But, recently they are playing a new role in dealing with the natural disaster such as huge Tsunami that attacked South East Asia a couple of years ago. They seem to be committing themselves strongly with social issues. The climate change on a world wide scale is said to be unavoidable, so the disaster or the environmental destruction of nature would increase more and more in the future to come. The idea of design to protect ourselves from such stress would play a major role in the future.

Other Southeast Asian countries are also working out on their economical development while coping with other various issues.

Surrounded by mountains and the ocean, though the destruction of nature is taking place, people in Thai try to shift their awareness towards environmental improvement and social reform. At some universities, they have started new sustainable design researches, and they look quite optimistic as they have a fruitful sense of beauty in their traditional culture.

The industrialization of Vietnam is remarkable like chasing after China. The 4th Eco Products International Fair was held in Hanoi this March (The first one was held in Kuala Lumpur, the second one in Singapore, and the third one in Bangkok). Nearly 100,000 people gathered, during three days’ session. Most of them were young people. The development in the city areas should be treated with cares so that there will be no regret in the future.

The tropical forest in Indonesia are facing a serious problem of illegal cutting down, yet meantime there's a good news that designers are trying to show a new business model focusing on sustainable design, and the business is going well.

Fig. 4:Indonesian wooden products “magno” series by Singgih Kartono

There was a collision between wild elephants and the people in a village in Sri Lanka. The extinction of the wild animals was once apprehended but now they found their way. They are making papers out of dung of elephants. The paper products made in Sri Lanka are designed specially to fit Japanese market and now sold at most of the zoos in Japan successfully and the profit is reinvested to Sri Lanka to expand local people’s employment and to make elephants and human be able to coexist.

Fig. 5: Sri Lanka’s elephant dung paper products at a paper show in Tokyo

In the Philippines, a project is going on by utilizing the remnants of bananas and pineapples, applying the technology to make washi, which is a traditional Japanese paper. The products are imported to Japan and used for interior design materials.

To put in words, the Asian characteristics may be expressed as having diversity of both nature and culture. Although Asian societies certainly are going through a radical change, there are also unchanging cultural aspects. The multi dimensional quality should work towards flexibility in change. Historically, both natural and cultural sustainability had been secured through this flexibility and hopefully this system will be able to work out for the future to come.

Changing the change: an European perspective

In which way in EUROPE design research is, or is not, an agent for sustainability?

Luisa Collina[26]

Abstract

European PhD programs are mainly characterized by a theoretical approach –historical, methodological - finalized to the education of the future academic bodies.

Important research centres promote a kind of research in the field of sustainability mainly based on a technological approach, rather than on a design approach. Other organisations have developed projects in the field of sustainability acting in a more incisive way as a stimulator of debates - with an entrepreneurial and professional attitude. EU funded projects are rarely focalized on design and sustainability.

In the paper that follows some cases are presented in order to offer a concrete view of the different way of developing design research on sustainability in Europe.

1. Introduction

It is difficult to try to give an answer to the question mentioned in the title of this paper for different reasons: lack of information, lack of already given studies about the state of the art, high heterogeneity of design research and high complexity.

The following text has not the aim to give a neutral quantitative analysis of design research in Europe, on the contrary it will try to give a very personal qualitative picture of the main characteristics and the more interesting recent initiatives of design research towards sustainability in this continent.

2. Design research in Europe

In Europe since several years some different PhD programs in the field of design have been established. Like most of the PhD programs worldwide, the PhD programs in Europe are mainly characterized by a theoretical or /and by a methodological approach and are mainly finalized to the education of future academic professors and researchers.

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Research *on* Design (from a sociological, historical, philosophical point of view) and research *for* Design (etnoghraphy, semiotics, ergonomy, technology etc.) are the major fields of the studies.

Design research, mainly focused on theoretical/methodological matters, has generally been hosted within this program. In fact, even if some PhD programs are considered to be "project based", most of the outcomes are not dealing with the design of possible desirable futures and haven't had a relevant impact -even in its follow up- in reality.

The criteria of evaluation of this kind of researches are mainly based on the methodology adopted rather than on the impact generated on reality. The results of these researches are generally diffused through internationally recognized academic networks and conferences (originally mainly localized in UK, today widespread but still closed in an academic circuit).

A less academic and more technological and manufacturing approach is perused in Europe in the big research centers that have been established in different countries and that are highly involved in EU funded research projects: TNO in the Netherland, INETI in Portugal, CNR in Italy are only a few examples for a kind of research mainly based on a technological approach rather than on a design based approach, with a high involvement of engineers rather than of designers.

Regarding the research *for* design PhD programs, in general, universitiesas well as large technological research institutions mentioned above have developed several different tools and methods for the design activity (in some cases we can truly recognize a sort of over-production of methodologies and tools): life cycle design, system design; solution oriented partnership etc. are just a few examples for that.

Kathalys, the institute run by TNO and TU Delft, has developed for example a system design methodology structured in five different phases (exploratory research and definition; system design; product/service specification; elaboration and practical experiment; implementation) and five different tracks along which sustainable product innovation takes place (development of product-service combination; sustainability; organisation; user; economic feasibility). This methodology is at the base of several projects finalized to the design of sustainable and innovative products.

Tracks **Phase**	**The product / service combination**	**Sustainability**	**Organisation**	**The user**	**The economical feasibility**
1 1. Future exploration	Innovation vision	Environmental bottleneck(s) and vision on the environmental opportunity	Actor overview	Vision on needs and consumer trends	Economical opportunity
2. System Design	System definition	Quantitative environmental targets	Commitment by partners for the project plan	User profile	Turnover target
3. Product / Service specification	Testable product / service combination	(hypothetical) environmental assessment	Partner agreement	Evaluation of acceptance	Economical assessment
4. Drawing in detail and testing	Tested product / service combination	(practical founded) environmental assessment	Business agreement	Practical foundation for acceptance and use behaviour	Investment and exploitation estimation
5. Implementation	Developed product / service combination	Environmental gain	New Business	Fulfilment of needs in a sustainable way	Profit

Table 1: Table with the expected deliverables per phase and per track. Helma Luiten, "The Kathalys method: a method for the development of Sustainable Product Service Innovations", *Hics – Higly Customerized Solutions*, Deliverable 1, 2001

These two realities (European PhD community and the European technological research centers) are not the only actors active in the design research field. In addition if the goal of this paper is to identify some interesting examples of research *through* design, able to generate changes in the society, it is important to enlarge the field of analysis and to include other design research initiatives.

Design research through design: the Italian Radical Design tradition

The proposal is to look a little bit back to our past, at the end of the 60's in Italy: to the work of Ettore Sottsass and to the Italian Radical Design a design and architectural movement that was extremely active between the 1966 and the early 70's thanks to two major cultural groups: Archizoom (Andrea Branzi, Gilberto Corretti, Paolo Deganello, Massimo Morozzi, Dario Bartolini and Lucia Morozzi) active from1966 to1974 and Superstudio (Adolfo Natalini and Cristiano Toraldo di Francia) active from 1966 to 1973.

The radical design brings into the discussion the role of the designer and his relationship towards the industrial production and the clients. Their design is no more pure functionalism, subjected to the industrial production, nor (or not only) pure answer to the expectations of the client: radical design is a critical design. The radical design groups were active both as professional designers (Sottsass was art director of Poltronova; he was designer at Olivetti etc.) as well as design researchers: designing visions for possible futures able to feed, in concrete, their future projects.

Archizoom developed for example *No-Stop city* in 1969; Superstudio, *The twelve ideal cities* (*Le dodici città ideali*) in 1971: two different but extremely interesting cases. *The twelve ideal cities* was a research of 12 visions, 12 dreams independent from the consumer culture. In 1971 the twelve ideal cities were abstract visions of fantasy feasible worlds, they were considered as an anticipation of a re-birth of urbanism. They have been published on a magazine directed by Italo Calvino (*Il Mondo*), who at that time was writing the *Invisibile Cities* (*Le Città Invisibili* published one year later).

The Italian magazines *Domus* and *Casabella* as well (the last one directed by Alessandro Mendini from 1970 to 1977) were the media for disseminating the radical design projects and essays. However, the most powerful moment for the presentation of the radical design has been the Italian exhibition: *The new domestic landascape*, in 1972, organized at MoMa in New York with Emilio Ambasz as curator:

In the same years the radical design groups were active also in the didactic activity. Ettore Sottsass, together with Archizoom, for example, organized some didactic design studios called *Global Tools* with the aim to disseminate their ideas to the future generations. These design studios were not very successful, but some years later some of the same people were involved in a new didactic and research project: the foundation of Domus Academy Research Center in Milan in 1982, a school (in Italy at that time there were no universities in design) but also, or mainly, a cultural laboratory. Since its origin (or mainly at his origin) it has developed research on urban development and new sustainable models. With Ezio Manzini, who has been director of Domus Academy, Andrea Branzi, Clino Trini Castelli, Chris Ryan, Stefano Marzano, Antonio Petrillo, they have given birth to researches through the development of projects, in connection to companies, but not directly answering to specific companies demands.

Agronica (1995) is a good example in this context: it has been a project of Domus Academy for Philips Design about models of weak urbanization. The idea was to experiment an idea of architecture based on a free supply of mobile constructional components, spread in an agricultural, semi-urbanized park. If for long time architecture and design were strictly linked to industry, in this project they are linked to agriculture: not with a view to the past but to the future; considering agriculture as an advanced self-regulated model of industrial production based on natural, renewable energies and not as a romantic landscape.

The city of *Agronica* was not a completely ideal city, but it was Eindhoven. The outcomes were not collected in some archives but they feeded a project for Eindhoven by Philips Design and "Bottega dell'Arte", directed by Stefano Marzano.

Design research *through* design nowadays

If we come back to nowadays and if we focalize on sustainability, where can we find examples of interesting (from the "Changing the Change" point of view) design research activities?

Regarding the research *through* design other different organisations have actively developed projects in the field of sustainability, with an attention mainly focused on the "impact factor" of their activities rather than on methodological aspects.

These organisations have different nature and different ways of acting:

6. as concrete **agents of innovation** with a more entrepreneurial and professional attitude;
7. as a **think tank** for future sustainable innovations in collaboration with private and public institutions;
8. as **stimulator** of more broad debates with a high bottom up approach.

The first point is represented by professional design offices that traditionally are interested in combining short term design activity and long term design of future scenarios: Philips Design and Design Continuum, are both two good examples of bridging professional design activity towards design research.

The second cluster is represented by some multi-cultural and multi-disciplinary, generally small, research centres in some cases related to a university (the Centre for Sustainable Design - CfSD was established in 1995 within the Faculty of Design at The Surrey Institute of Art & Design, University College, in the UK; Imagination Lancaster[27], a recent multidisciplinary research institute, co-directed by Rachel Cooper is fore example connected to Lancaster University, UK; The Art and Design Research Centre within the Sheffield Hallam University in UK[28]) or to public institutions (for example RED unit leaded by Hilary Cottam[29] as Director of the Design Council or to the Young Foundation[30] formed in 2005 from the merger of the Institute of Community Studies and the Mutual Aid Centre in London in order to re-energise the powerful combination of research and action).

Their goal is to provide advanced multidisciplinary projects (provocative pilot projects as well as longer term studies) in some specific selected thematic fields. The focus is mainly on the user, depending on the kind of institution, the innovation is mainly social based rather than technological[31].

A case able to exemplify this kind of activities is given by *EMUDE_ Emerging Users Demands for Sustainable Solutions*[32] a specific support action funded by the European Commission the aim of which was to outline comprehensive maps of emerging sustainable users demands and to generate a set of qualitative scenarios (on how these demands, and the consequent products and services innovation, may co-evolve). The final goal of EMUDE was to translate these scenarios into roadmaps for future research and development activities, to inform and inspire the decision-makers and to influence the future end-user's perceptions and demands. The "core" of the whole project was given by the collection of information on "promising cases" of emerging phenomena on sustainable consumption and bottom-up innovation in Europe. This activity has been performed through the creation of a design school network: the design school members became a sort of

[27] Imagination, co-directed by Rachel Cooper, is focalizing its researches on topics like "design in the built environment; urban regeneration; design against crime and socially responsible design", as well as healthcare, education, open innovation, sustainability and wellbeing.

[28] The Art and Design Research Centre with the Centre for Health and Social Care Research is part of the Lab4Living collaborative research group. Lab4Living has the aim to propose creative strategies, based on a holistic, human-centered approach, for the development of future living environments for people of all ages and abilities.

[29] Hilary Cottam deals with social issues of our day, specifically on education, health and criminal justice. It comes out a very interesting thematic picture that integrates the traditional fields of design.

[30] The Michael Young Foundation, formed in 2005, is active in different fields like health, learning, wellbeing, neighborhoods and material consumption.

[31] The areas of design are no more related to a merchandise approach (lamps, electric appliances, furniture, etc.) but to problematic areas of our present society that need to be solved trough a set of different design outcomes (new products + new services + new interfaces + new spaces, etc.).

[32] E-Mude_Emerging Users' Demands for Sustainable Solutions with the European Commission 6th Framework Program – EU, 2004-2006. *Integrated projects_The creation of "knowledge communities" in production technologies*; (scientific coordination by Ezio Manzini; project management by Luisa Collina);

European antennas; design students were like “coolhunters” of innovative and sustainable solutions; the schools and the students together had a role of “catalysators” able to generate visions of sustainable futures.

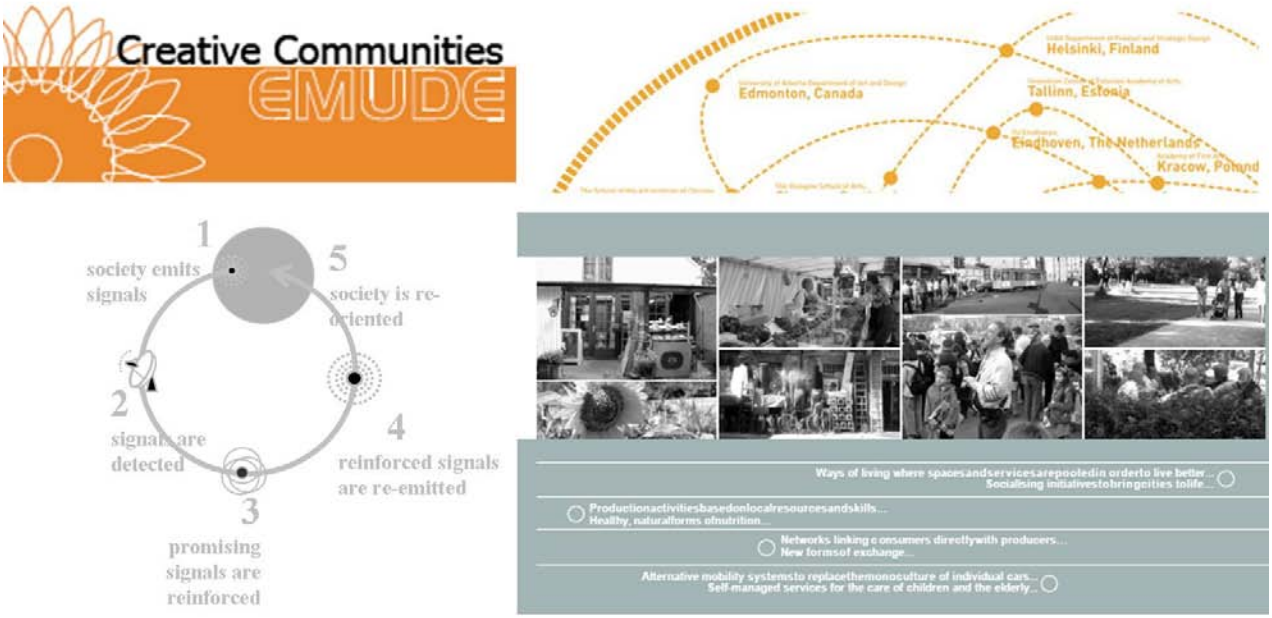

Fig. 1: EMUDE_Emerging Users Demands for Sustainable Solutions Design School Network as a research infrastructure for the detection of “promising cases” on sustainable consumption in Europe. (Meroni Anna, 2007)

The third “family” of research actors is a bit further away form the institutional or professional design research and is closer to the communities of associations, programs and non profit organizations active in promoting a broad debate on our sustainable future. The ways of rising awareness of the people are very different: from organizing nomadic exhibitions (*SEP - Sustainable Every day Project*) to successful conferences and on line debates (*Doors of Perception*) or to events finalized to experiment new possible sustainable solutions and services (*esterni*).

An interesting Italian case is given by *esterni*. *Esterni* is a non profit association based in Milan, founded 12 years ago by a group of architects and designers. Among the other projects they are promoting *Design Pubblico*: a design activity for public spaces, considered as spaces for socialization, for experimentation and for sharing. Street furniture like socializing signs, services for the city like the extraordinary lines, or events are only some of the “concrete ideas for the city” designed by *esterni*. In addition they are working on topics like co-housing, bed sharing and temporary hotels in order to rise the level of hospitality of the city and to permit the contact between local citizens and visitors.

Fig. 2: Esterni_Design Pubblico and other activities (photo by Luisa Collina and www.esterni.org)

These cases are good, positive examples for innovative design driven experimentations towards sustainability.

If we observe this broader community of design researches we can try to find some main characters, that could be considered as a contribution of the European design to the worldwide demand of design research for “changing the change”.

3. A European approach towards design: the product service system approach

Differently from the Anglo-Saxon tradition of design in which the different areas of design are very well defined and isolated, in Italy and in Southern Europe these separations have never been rooted inside the design culture, both in the profession as well as in the academic environment: for example the *made in Italy* design tradition with architects/designers active in the different fields (from furniture to electronics) as well as on different scale (from the micro of the single object to the macro of urban scale visions); similarly in the universities the borderlines between industrial design and product design; furniture design and interior design; interior design and architecture etc. have always been an interesting intellectual opportunity to be crossed; to try to eliminate them; to enlarge them etc.

In the tracks of this tradition the concept of product-service-system design has taken form and has been further theorized[33].

The new concept of PSSD is based on the recognition of the changes that have invested the products, the spaces and the communication artifacts around us and that in some cases have increasingly weakened the traditional borders of the different design disciplines: products become

[33] Francesco Mauri (with Francesco Bergonzi, Gianluca Brugnoli, Diego Canneri), *Progettare progettando strategia: il design del sistema prodotto*, Dunod, Milano 1996

more and more immaterial incorporating digital advanced technologies; spaces become more and more complex with envelopes of interior spaces (as well as of entire buildings) assuming the function of giant communication screens and interfaces with the individuals; environments become intelligent; materials become smart, able to change colour, shape and to emit light responding to a touch, communication is no more static, but dynamic, constantly interactive, and so on.

Just as an example a store, in the past considered as the specific area of interest of interior designers, is nowadays defined, from different authors, as a "hypermedial site", a "communicative artefact", a "relationship platform", "a brand stage" or a "service evidence": different ways of pointing out the interlinked relations between communication, interactions, strategies, branding and services that are hosted in this kind of physical spaces.

In addition the increasing sensibility for the environmental impact of products and services has asked for so called "holistic" methodologies and design approaches.

In this framework the necessity to overcome the traditional disciplinary borders of design in favour of a systematic, multidisciplinary approach emerges: Product Service System Design (PSSD) is one way in which this approach is identified: a term that has more than one "identity" at the present moment and that can be considered in a broader sense as an interesting macro area of researches and activities, more than an already stable design approach.

In fact, the ways in which this term is used are very heterogeneous: different focuses, different forms, different perspectives and in different contexts; with a more technological approach or socio-cultural approach; with a top down approach (starting from enterprises and institutions that could promote PSSD) or bottom-up approach (starting for the users and from the society in general); focalized on the strategies of a company or institution towards its market, on the production process and on the entire life cycle; on services; on experiences; on interaction between users and objects and so on. A very complex picture difficult to classify through simple categories. In the following paragraphs some hypothesis of clusters are proposed:

9. the **"extension"** of one of the design fields into the others: in some cases the design process starts from a new service, product, interior or piece of furniture; the approach, in these cases, is to observe and design the impact of this new item on the other branches of design: from product to packaging to display….; from a service to the communication, to the web site……; from the retail space to the communication system and services, etc. …in order to design "seamless" a complete and coherent solution;
10. the **problem-based approach**[34] : to answer to a problem-based design brief means, very often, to recognize the interdependency of each single element and/or process form the others. Single products, in this perspective, are not isolated from other items and from their contexts; on the contrary their design is connected to the study of the entire chain and of their environment; in other words it involves the design of all single parts and processes that make up the product-chain and the product-system. *"It is for example not about redesigning one office chair that deals with choosing another material that is better to recycle, has less toxic elements or has a lower energy content. But it is about developing a complete new sustainable office. Now we have to think of how to reduce paper use and energy use (in the office and during the period of going to the office) and dealing with efficient use of space. The solutions go beyond the boarders of one product and one company. In the office case you have to deal with office furniture, copy machines, data communication, telecommunication, etc. The result is in most cases not only one product, but moreover a system of product(s) and services."*[35] This problem-based approach in many cases is carried out, since the start of the project, by multidisciplinary design teams:
11. the physical evidence of **abstract concepts**: some other ways of considering PSSD start from more abstract concepts that find the way of materialization in terms of a set of different design outcomes: the design, for example, of "experiences", "solutions",

[34] The focus of Kathalys, the institute established by the Dutch Ministries of economic Affairs, Housing, Spatial Planning and Environment involving TNO and TU Delft, was concentrated in three areas: home life, work and mobility.
[35] Helma Luiten, "The Kathalys method: a method for the development of Sustainable Product Service Innovations", Hics – Higly Customerized Solutions, Deliverable 1, 2001

"strategies", "brands", etc. means to enter into the design of several different material or immaterial elements trough which these concepts come into reality;

12. the **design role play**: other interpretation of PSSD are based on the selection of a specific perspective of the design process: like in a cash dispenser, where the user has a "frontal" interaction with the machine, the bank worker a "back" one and the person in charge for the logistic a "zenithal" one, the same can be observed in relation to the product service system design: user centred design and experience design; strategic design and brand design; product-chain design, life cycle design and system design cover for example these three different perspectives.
13. the **innovation** goal: an important criteria for classifying the different interpretations of PSSD is related to the goal of the design process in terms of innovation: highly technological, marketing oriented or social, for example; these differentiation origins very different systematic approaches towards design.

4. A design focus: not only object but spaces, services, lifestyles, territories

Considering the Italian tradition of Radical Design, in Southern Europe we assist nowadays to a further enlargement of the PSSD area: the territory and the activities related to it, enter the design system approach, both as a resources as well as the target of design activities.

Italian design has in fact in its DNA a strong relationship towards local resources: it is thanks to the constructive dialogue and proposals between craftsmen/small businesses and designers that the *Made in Italy* phenomenon has reached such success. Enlarging this view and not limiting the perspective to the manufacturing system of small and micro enterprises, design acquires the capabilities to strengthen the local resources in general (like agriculture, handcraft, cultural heritages, natural landscape and oenogastronomy), valorising energies, vocations, and traditions of local territories; redesigning products, services, spaces, communication and distribution systems related to these fields.

MEDEsign: strategies, instruments and operations in industrial design for valorising and boosting resources in the Mediterranean area[36] is an Italian research focused on the idea that design can contribute to the development of the territories, considered as a place of sedimentation of different values: the knowledge and competences of handcrafts; the natural landscape, the agro alimentary tradition; the architectural emergences and cultural heritages. These are extremely valuable resources, deeply localized, related to an idea of physical well being, hospitality, beauty and cultural growing, in the tradition of the *Made in Italy* sectors.

[36] Italian Ministry of the University and Scientific and Technological Research (MIUR 2001 – 2003). *Me.Design: strategies, instruments and operations in industrial design for valorizing and boosting resources in the Mediterranean area from local to global*, coordinated by INDACO Department, Politecnico di Milano

Fig. 3: MeDesign_ Action researches themes (picture by Beatrice Villari)

More recently, some contemporary projects have been indirectly generated by these visions like for example *Agricultural Park South Milan*, a research funded by the Italian Ministry for Univeristy and Research (2005-2007), developed by Politecnico di Milano and other partners, focalized on the reinforcement of the relation between the park localized in the south of Milan and the city through the redesign of the agricultural and food distribution system; or *La città degli orti*, a project designed by Aldo Cibic in 2008 for *Progetti e Paesaggi* a fair about products, materials and services for in-outdoor in Bologna.

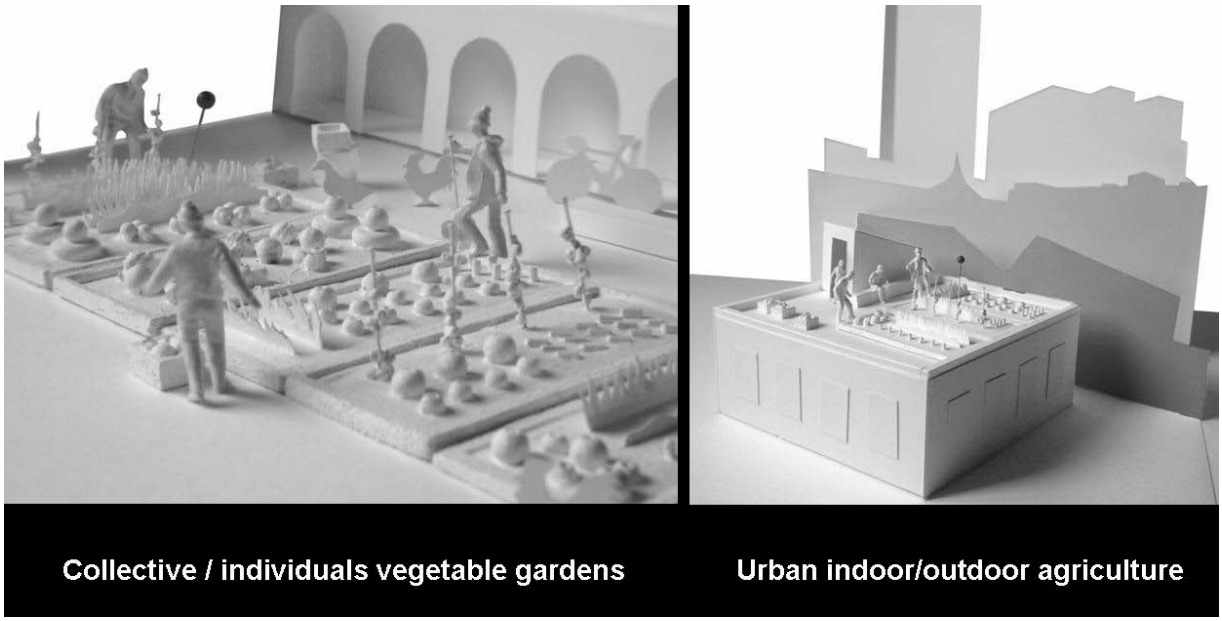

Fig. 4: Agricultural Park South Milan_Urban countrysides in rururban areas (responsible of the project and photo by Anna Meroni)

The sustainable development of territories is, from this point of view, a very interesting and strategic area of research. The summer schools organized with the framework of *Turin World Design Capital* want to be a sort of experimentation on this field: asking to international world known designers to interpretate this kind of "bottom up", territorial local design approach, tutoring the students in developing new solutions.

The aim of the conference *Changing the Change*, of the summer schools related to the conference and of this proceeding is in fact to strengthen the capability of design research to turn into action. This means to remind us, with the words of Lewis Mumford, that *"human beings walk with their feet on the earth and with their head in the clouds"* combining our history and our reality with the design of **"*utopia*"**, that comes (always with the words of Mumford,1922) from the greak words **"*eutopia*"** which means **"*the good place*"** rather the place that does not exists.

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2. Selected papers by theme

Theme 1 Visions **/ Ways of living**

T1.1 Scenarios/1	**T1.2 Scenarios/2**	**T1.3 Ideas/1**	**T1.4 Ideas/2**
P1. Creative Communities for Sustainable Lifestyles. Visions of sustainable ways of living in Brazil, India, China and Europe... [Penin, Jègou, et. al] P2. Design in Public Sector Services. Insights into the Designs of the Time (Dott 07) public design commission projects [Tan] P3. The Melbourne 2032 project. Design-visions as a mechanism for (sustainable) paradigm change. [Ryan] P4. Creative Places for Collaborative Cities. Proposal for the "Progetto Habitat e Cultura" in Milan [Franqueira] P5. Urban Memory Responds to the Change. Improvement and Revitalization of Public Spaces in Macao's Historical Corridor [Zhu, Pinheiro] P6. "Demolish" and "Construction". A Research on transition of urban communities and sustainable lifestyle in China [Zhou, Liu]	P7. A vision of an urban countryside. Service Design as a contribution to the rururban planning [Meroni, Simeone, et al.] P8. Other Design at Sulukule. A Local Development Project in a Degenerated Historical Area of Istanbul under the Threat of Demolition [Kaya, Yancatarol, et al.] P9. The Sustainable Development of Traditional Urban Spaces in Wuxi, China -The changing of the road of Zhong Shan (2002-2007) [Li] P10. Beyond localism, looking for sustainability - Designing "typical knowledge" active-action [Lupo] P11. Rubbings. Preserving the industrial memories amid change [Zhang, Cao] P12. Landscape Ecology as a basis of Landscape and Urban Planning and Design [Thomas]	P13. Beyond Abundance. Motivations and perceived benefits underlying choices for more sustainable lifestyles [Marchand, Walker, et al.] P14. ARK-INC. An alternative view of what 'designing for sustainability' might mean [Singleton, Ardern] P15. Ethically Sound Innovations. The phenomenology and taste of the outdoor elites [Uotila, Rytilahti] P16. Proposals for a Good Life: Senior Thesis Projects from Parsons Product Design 2003-08 [Kirkbride] P17. Fashion that helps us flourish [Fletcher, Grose] P18. The emergence of shamanic wisdom in the culture of the modern Brazilian project. The perspective of a new rationality for design [Badan]	P19. Projecting new forms of neighbourhoods. The creation of a link between the inhabitants as an answer to changes in society [Lanz] P20. Design Activism as a Tool for Creating New Urban Narratives [Julier] P21. From sustenance to sustainable living in India - Elements of vision based on collaboration with local NGOs. [D'Silva, Jégou] P22. Knowledge Communities. The actions of design for the construction of knowledge-based territorial systems [Veneziano] P23. Eco-Cybernetic Architecture [Goodbun]

Theme 2 Visions **/ Ways of producing**

T2.1 Models of development/1	**T2.2 Models of development/2**	**T2.3 Production Systems/1**	**T2.4 Production systems/2**
P24. Design for the Majority. Designers (Collaborators) As Enablers Of Social Entrepreneurship And Sustainable Product Development. [Speer] P25. Shifting Trajectories. Advancing cosmopolitan localism through participatory innovation [M'Rithaa, Verveckken, et al.] P26. The Influence of Design. Examples from Bangladesh [Bauhoff] P27. Design culture: from Product to Process. Building a network to develop design processes in Latin countries [Celaschi, De Marco, et al.] P28. Technoforest. Designing solutions to humanly regenerate ecologically disturbed areas [Barbosa]	P29. Designing transition paths for the diffusion of sustainable system innovations - A new potential role for design in transition management? [Vezzoli, Ceschin, et al.] P30. Design & Transition. What designers can learn from the Transition Movement [Boehnert] P31. Product Design Influencers and Triggers in Micro and Small Enterprises in Kenya. Case Study of Sofa-makers in Gikomba Market, Nairobi. [Osanjo] P32. Design (x) Diaspora. implementing sustainable development in developing countries [Capjon, Edeholt] P33. Breeding cultures of exchange. [Lommee] P34. "Parasitic" Design Strategies for Environmental and Social Sustainability - Vision of a Diffuse Universe of Parasitic Products and Services [Langella, Dell'Aglio, et al.]	P35. New Outputs policies and New connections. Reducing waste and adding value to outputs [Ceppa, Campagnaro, et al.] P36. Supporting Communities. Design led collaborations exploring the creative and economic potential of materials made from waste. [Dehn] P37. MetaCycling. Extending Products' Life Spans Using Virtual Communities and Rapid Prototyping [Lalande, Racine] P38. Design for disassembly and reuse for renovation of housing in Flanders. Case Study for existing (high-rise housing) buildings [Paduart, Elsen, et al.] P39. Integration of Haptics into the Design. A designer-oriented tool for virtual clay modelling [Bordegoni, Cugini] P40. A proposal for communicating systemic design. A "systemic tour" showing systems design applications in the region [Signori]	P41. Crafts_Community_Design. The strategic role of design to promote local production systems [De Giorgi, Germak] P42. Design methodology and sustainability: Between craftwork production and industrial production [Cavalcanti, Andrade, et al.] P43. Textile Traditions and Fashion Design. New Experiential Paths [Conti, Vacca] P44. New Artisanship for New Communities. Frugal Design as the way of the artisan in the new world. [Panghaal] P45. Exploring indigenous innovations: Ascertaining the Scope for Design Interventions for their Successful Commercialization [Mehta, Punekar]

Theme 3 Proposals **/ Daily life solutions**

T3.1 Services and places/1	**T3.2 Services and places/2**	**T3.3 Products and technologies/1**	**T3.4 Products and technologies/2**
P46. The Roots of Change embraced by local food system. Design visions, from the sustainable food system to the prospect multidisciplinary key-principles for a sustainable food development [Vasconcelos]	P52. Design for Social Innovation. Enabling replication of promising initiatives for sustainable living in Brussels and Paris [François, Joëlle et al.]	P58. Less Is More: What Design Against Crime Can Contribute To Sustainability. [Gamman, Thorpe]	P65. Macrocomponents. An alternative proposal for the production of home integrated systems. [Cozzo]
P47. Sybaris. Fast good food [Vesseron]	P53. The hidden value of allotment gardens in the urban context and the opportunities for design intervention. [Brault]	P59. Are you worth it? Can you fix it? Investigating the sustainability of mundane activities using theories of everyday practice and human/ object interactions [Fisher, Hielscher]	P66. Rethinking the smart home: An environmental perspective. [Loi, Melican]
P48. Designing innovative forms of intermediation and communication. Towards sustainable production and consumption systems [Krucken]	P54. Design tools for sustainable lifestyle: the Italian co-housing experience [Conditi, Ferri]	P60. Embedding sustainability on do-it-yourself products aiming at low-income families. A Case Study on Shelves Used to Divide Living Spaces. [Santos, Lepre et al.]	P67. A Study on the Framework Development for Context Analysis in Smart Home Environment With emphasis on user's intention and behaviour. [Ryu, Kim et al.]
P49. Sustainable mobility design in contemporary towns High social and technological innovation alternative mobility system [Marano, Bucchianico]	P55. Contribution of Design to EU Projects and Programs in Italy An experience on the use of a "design-oriented approach" in an EQUAL project. Compared outputs. [Morra, Vitolo]	P61. Design for all. A co-design experience in rural India for healthy indoor cooking [Rocchi, Kusume]	P68. The sector of household electrical appliances. An integrated system [Marino]
P50. Transport in a systemic perspective. How can we change attitudes and behaviours in people? [Pera]	P56. Collaborative Services and Mobile Network. Observation of social innovation and anticipation of sustainable lifestyle in China [Gong, Feng at al.]	P62. Nomadic way of life. Design tools and policies [Barbosa, Santos]	P69. Surrounded by high-tech environmental persuasion. Possibilities for new expressive surfaces [Hipólito, Câmara]
P51. Service Design to foster premium prize and sustainable mobility in urban contexts [Meroni, Sangiorgi et al.]	P57. Our House: Interior Design and Sustainable Consumption [Castro]	P63. Notes on ecodesign, body and the post-human thought. [Rocca]	
		P64. UFOs - Unidentified Future Objects. A suggestion on civilization brought from creative bottom-up instances [Mendoza]	

Theme 4 Proposals **/ Enabling Systems**

T4.1 Tourism and mapping	**T4.2 Energy and packaging**	**T4.3 Networking/1**	**T4.4 Networking/2**
P70. Social Innovation and Service Design of community-based tourism. The case of Prainha do Canto Verde, in the State of Ceará (Brazil) [Langenbach, Spampinato]	P75. Beyond 1000 Suns. The usage of 'design culture' to create a new paradigm for a hybrid heat-and-power solar system. [Tarazi]	P80. Design for Social and Environmental Enterprise. Design at the Service of Social Businesses [Brass, Bowden]	P86. DAC_Link. A 2.0 tool for SMEs' design innovation. [Arquilla, Genco]
P71. Design, local development and fair tourism. The EKIT project [Dupont]	P76. Energy produced by its own territori. How outputs generate widespread business. [Barbero, Fassio et al.]	P81. Product service systems and non-market oriented approach. Methodological and ethical considerations from a design perspective [Morelli, Jonas et al.]	P87. Research in strategic design: a teaching experience. The design research school model to build a dialog between Brazilian university, society and industry. [Borba, Reyes et al.]
P72. Knowledge cartographies. Tools for the social structures of knowledge. [Quaggiotto]	P77. Design stories for a sustainable society. Case studies of responsibility in practice. [Mottram, Atkinson]	P82. Design Directory. A strategic web-tool for the Italian design system. [Simonelli, Arquilla et al.]	P88. The Vision for Mississauga's City Summit. Collaborating for Change. [Walden]
P73. Handling Changes Through Diagrams. Scale and Grain in the Visual Representation of Complex System. [Ciuccarelli, Ricci et al.]	P78. The Evolving Role of Design: Opportunities and challenges for the Australian Packaging Industry towards sustainable design. [Avendano]	P83. Conceiving the Design Centre of the future. Transforming the economical and social landscape through multidisciplinary projects and integrated user-centred design research [Vanderbeeken, Zoels et al.]	P89. New configurations for networks. The case of the Virtual Institutes. [Bartholo, Bursztyn et al.]
P74. An inconvenient arrow. Visual explanations of ecological cycles in science learning material. [Mølhave]	P79. Fish Box in EPS. Zero Impact. [Catania]	P84. Systems Design Becomes Easy Like a Game. A travelling exhibition as a tool to communicate sustainable society [Balbo, Corsaro]	P90. An Industrial solution for Kenya and Africa. Using home-grown ideas to create sustainable livelihoods [Amollo]
		P85. Design, Research, Italy. Maps, visions and perspectives of academic design research in Italy. [Bertola, Bianchini et al.]	P91. Business Idea Design Supporting tools and services for start-up design-oriented companies. [Vignati, Carriera]

Theme 5 Tools **/ Design Theories**

T5.1 Design education/1	**T5.2 Design education/2**	**T5.3 Design culture/1**	**T5.4 Design culture/2**
P92. A Dialogue on the Future of Design Education. [Gornick, Grout] P93. What if the World Were A More Equitable Place Would Any of Us (Designers) Be Necessary?[Stairs] P94. The Experiential Experiment: Is design education sustainable in a changing university environment? [Gaston, Scott] P95. Sustainable Design r&d – Geneva. Bringing University and training design towards Sustainability. [Corminboeuf, Styger] P96. How you define is how you design. Problematitic definitions in Design for Sustainability Education. [Clune] P97. Looking for Likely Alternatives (LOLA). A didactic tool to approach sustainability by investigating social innovation in daily life. [Thoresen, Jegou, et al.]	P98. DEEDS: a new Teaching & Learning resource to help mainstream sustainability into everyday design teaching and professional practice. [Blincoe, Fuad-Luke, et al.] P99. The Learning Network on Sustainability. A mechanism for the development and diffusion of system design for sustainability in design schools. [Penin, Vezzoli] P100. Productive friction: a case study of design research between practice, education and community in rural Australia. [Harrisson] P101. Sustainable Product Design: From delivering sustainable products to enabling sustainable lifestyles. [McKay, Raffo, Trowsdale] P102. Changing Perspectives on Design Education (…) at the Universidade Federal do Rio de Janeiro (Brasil). [Nicolaiewsky, Monteiro] P103. Design-Oriented Futures Wheels. Using Foresight Methodologies in our Design Schools. [Kohtala]	P104. Systems Design Approach. Interdisciplinary/systemic innovation. [Bistagnino] P105. Social Design: Exploring the systemic conditions of sustainable change. [Tang, Klein] P106. Changing the Change: A Fractal Framework for Metadesign. [Wood] P107. Being Here. Attitude, place, and design for sustainability. [Badke, Walker] P108. 360°Eye on Sustainability. An experimental research approach to construct an useful sustainable language. [Zandanel] P109. Non-designed design. A Study on Unprofessional and Non-productive Design in Shanghai [Chen]	P110. Sermons in Stones. Argument and artefact for sustainability. [Walker] P111. Design and values: materializing a new culture. [Malaguti] P112. Changing a phenomenal change. Reassembling the self through a new ethics of negotiation. [Merwe] P113. Ethics and aesthetics in industrial production: Possible ways for the design in this new century. [Moraes, Figueiredo] P114. Ethics Become Sexy! A critical approach to Design for the right to access to aesthetics and technology in the knowledge society. [Imbesi] P115. A Taxonomy of the Changing World of Design Practice. A vision of the changing role of design in society supported by a taxonomy matrix tool. [Young]

Theme 6 Tools **/ Design Methods**

T6.1 Design Thinking/1	**T6.2 Design Thinking/2**	**T6.3 Design Process/1**	**T6.4 Design Process/2**
P116. Designer as Agent of Change. A Vision for Catalyzing Rapid Change. [Banerjee] P117. Design education as a Change agent: intersections of Need, Learning and Knowledge Transfer Represented in the Designmatters Initiative. [Amatullo] P118. Everyday Imagination, Practices, Systems. Designing with people for systemic change. [Sangiorgi, Drew, Buscher] P119. Visions and possibilities of a transsociation between design and anthropology. A method for a glocally driven product-system innovation. [Staszowski, Leirner] P120. Design and New Horizons of Systemic Interactions. Technology and application innovation for a holistic approach to problems. [Vicentini, Bruno]	P121. Designing Innovation collecting Wishes. A method to integrate individual users into the product innovation process. [Nishiyama, Peruccio] P122. Design visions, proposals and tools (A Study of Design Methods for Sustainable Innovation). [Quinto] P123. When Horns Become Method. [Scaletsky] P124. Is change as good as a holiday? Using metaphysical bonds to design enduring change. [Coxon] P125. Co-Designing a Sustainable Culture of Life. Design tools: designing research methods for sustainable change. [Hocking] P126. Hybrid Ontologies. Design knowledge in a hyper-connected fluid society. [Ciastellardi]	P127. Design as Activism. A Conceptual Tool. [Thorpe] P128. Integration through communication tools. How design can facilitate social system integration processes. [Scagnetti] P129. Sustainable Use. Changing consumer behaviour through product design. [Bhamra, Lilley, Tang] P130. The Management of Design as a Tool for Cultural Change Leading to Sustainability. A case study in the Industrial Company of Pernambuco, Brazil. [Cabral, Cavalcanti, Andrade] P131. The Reconstitution of the Domains of Everyday Life. A tool for assessing the health of existing conditions and a framework for designing sustainable solutions based on principles from the natural world. [Kossoff] P132. Design by Components. An operative methodological tool for the ecocompatible industrial design. [Virano]	P133. Metadesign tools. Designing the seeds for shared processes of change. [Tham, Jones] P134. The Slow Design Principles. A new interrogative and reflexive tool for design research and practice. [Strauss, Fuad-Luke] P135. P-KIT, picture listening for community planning. A simple and effective design research tool for facilitators and habitants in participated urban processes. [Rogel] P136. Is design the answer to cultural acceptability of waterless toilets? A collaborative approach to design research. [Fam] P137. Real-time layouting. A design “way of doing” to improve participatory process tool-kit, applied to the conversion of buildings. [Giunta] P138. Criticality Meets Sustainability Constructing critical practices in design research for sustainability. [Maze]

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

DESIGN EDUCATION AS A CHANGE AGENT:

Intersections of Need, Learning and Knowledge Transfer Represented in the Designmatters Initiative

Mariana Amatullo[1]

Abstract

The multiple environmental and socioeconomic challenges confronting humanity today, and a contemporary context that presents the promise of perpetual connectivity and accelerated patterns in information consumption and creation, represent powerful global forces that are shaping the way we live, work, and learn. Such pressures and opportunities at an international scale are affecting design education in significant ways, creating an unprecedented need to deliver knowledge, experience, and sophistication amidst a global playing field. The college-wide initiative Designmatters at Art Center College of Design advocates for applied research approaches to complex humanitarian issues and provides unique methodologies for creative reform and change, empowering a new generation of designers to imagine critical solutions for society's well being into the future.

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Introduction

For over 77 years, Art Center College of Design, located in Pasadena, California, has been one of the world's leading institutions for design education. Art Center offers undergraduate and advanced degrees in a wide variety of design and fine art disciplines, and the college's pragmatic, real-world approach provides graduates with the education and experience to become creative leaders in their chosen professions. Art Center's curricula are multidisciplinary, rigorous, and dynamic in nature, responding to a fundamental belief that interchanges among disparate fields of knowledge and design disciplines have become essential to contemporary higher education in general – and to design education in particular. Today the college also maintains its top-ranked position by evolving its philosophy and practices in response to the rapid technological and socioeconomic changes of our era. The institution is a laboratory for innovation, a locus for partnerships and collaborations with industry and public sector development agencies, and a center of international public dialogue on the larger role of design.

The *Changing the Change* Conference takes as point of departure the accelerated global transformations of today world to offer a provocative inquiry about the evolving role of design as an overall instrument for positive change in the context of the World Design Capital Torino 2008.[2] The conference also presents a terrific platform for designers and researchers to discuss research methodologies and practices that can respond to this rather bold--but indispensable--call to action, which in turn is deeply synergetic with Art Center's institutional educational agenda as epitomized by Designmatters, a college-wide examination of social and humanitarian applications of design and responsible business practices.[3] This paper presents two Designmatters project case studies, the Mpala Project, and a Public Awareness Campaign for Climate Change, which have been selected for the connection they make between sustainable human development issues, and design, across multidisciplinary fields including industrial, communication, and narrative design. An in-depth discussion of the core methodologies and perspectives gained from these projects also aims at underlying the value of linking real-world issues with academic practices, in order to promote a deeper awareness and understanding of the global context, which results in turn in more empathetic students.[4]

The Mpala Project: A Case Study for Participatory Design

1. A Unique Partnership in the Context of A Global Competition

In the fall of 2006, Art Center College of Design partnered with a small community-based organization in northern Kenya, Mpala Community Trust (MCT), to enter the World Bank 2007 Development Marketplace Global Competition: *Innovations in Health, Nutrition,*

[2] Changing the Change, http://emma.polimi.it/emma/showEvent.do?idEvent=23.
[3] For a comprehensive overview of the initiative and portfolio of projects see http://www.artcenter.edu/designmatters.
[4] For an interesting perspective about participatory design and a testimonial about Designmatters, see David Stairs, *Blowing Competitions Up, and Other Acts of Good*, April 23, 2008, http://www.design-altruism-project.org.

and Population for Poor People.[5] With the motto "turning ideas into action," and its support for social projects with high potential for impact and scalability, this prestigious competition functions as a social entrepreneurship incubator and grant-making program that rewards grass-roots innovation, and has been responsible over time for highly successful development projects, such as, for example, a water play pump that doubles as a merry-go-round.[6]

The competition's mission of building partnerships among public, private, and civil society sectors that foster dialogue, understanding, and truly sustainable solutions, represented and ideal platform for Art Center's Designmatters initiative to identify critical design interventions that could benefit a strategic partner by harnessing creativity for social impact.

As the sole professional and reliable health care provider in a region roughly the size of Wales, MCT serves approximately a hundred thousand people scattered in remote communities far from any existing medical center. The clinic's infrastructure consists of a couple of modest sized rooms at base camp, and an integrated outreach system that relies on specially outfitted Land Rover vehicles, a few bicycles, and periodic camel convoys to deliver critically needed medicine and health education to the nomadic population who live in the vast plateaus of Laikipia and Samburu, northwest of Mount Kenya.[7] The integrated mobile clinic system utilizes local nurses, and counselors who are trained to deliver a wide range of health services, and share knowledge about healthy lifestyle practices, HIV/AIDS prevention and family planning, among key health issues. From an operations standpoint, MCT works within a participatory framework, recruiting its health workers from the community. This model has led to MCT's widespread acceptance in the region since its inception in 1999, and an increase in demand for services by these underserved communities.[8]

[5] The project was among the 105 finalists selected from over 2,900 proposals worldwide. The World Bank, Washington, D.C. , http://siteresources.worldbank.org/DEVMARKETPLACE/4416738-1196093766795/21583185/DM.htm.

[6] The Playpump® water system, the core product of a small company in South Africa, Roundabout Outdoor Water Solutions, was a winner of the 2000 Development Marketplace Competition. The play pump functions in tandem with an ingenious merry-go-round device, which was initially adopted throughout village schools in South-Africa. Community members install it above wells that harness the power of children at play to pump water to a holding tank that displays health education messages. The funding and visibility of the competition enabled the project to scale up. Today, with its international partner, the US-based non-profit Playpumps International, the goal is to install 4,000 PlayPump® water systems in 10 countries in sub-Saharan Africa by 2010, bringing the benefits of clean water to up to 10 million people. For further information about the history of this development marketplace winner, see http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/ and http://www.playpumps.org/site.

[7] For further information about Mpala Community Trust (MCT) and its sister organization, Nomadic Community Trust, see http://www.mpala.org/.

[8] The communities that MCT and NCT serve are among the poorest in Kenya. Data collected by MCT points to a population that has been mostly untested for HIV/AIDS leaving a gap in the data set for Kenya, and one that urgently needs basic medical services and counseling in HIV/AIDS, reproductive health and female genital mutilation (FGM). Samburu district's population is approximately 150,000 scattered over an area of 21,000 sq. km. Laikipia's population numbers approximately 322,190 people over 9,000 sq. km. Over 70% of population in Laikipia and over 90% in Samburu is nomadic or semi-nomadic, creating great challenges in providing health services. Livelihoods revolve primarily around livestock movement to a seasonal calendar.

For the competition submission process, Designmatters at Art Center oversaw a core project team of Art Center staff, alumni, and faculty[9] that worked together with MCT staff and counselors over an eight-month period (from fall 2006 up to May 2007). The outcomes of initial fieldwork in Kenya, and joint research between the design team and MCT were the basis of a proposal that underwent two rigorous rounds of judging by international and public policy experts. MCT identified two key areas of critical need to improve upon the health care delivery system that in turn became two main opportunities for design intervention:
1) Expansion of the mobility and outreach capacity of the clinic by designing a system of transport, packaging and solar-powered refrigeration that would allow camel convoys to carry medicines such as vaccines that they currently cannot, because they spoil under heat conditions; and 2) visually-based and culturally sensitive materials to support the health education efforts of the MCT counselors, who work with a population that is 80% non-literate.

2. A Breakthrough Mobility System

The project's significance to both design research and application made it one of the top hundred finalists in the competition.[10] While ultimately not funded by the Bank, development has continued to date beyond the competition's framework, and presents an interesting case study about what can be characterized as a certain "nimbleness" and entrepreneurship quality at the core of how the Designmatters program operates at Art Center.

While all Designmatters projects are closely tied to the college's undergraduate and graduate curricula in all design disciplines, and typically take the form of course assignments, studios, or independent study projects that are selected for their educational enrichment value and real-world impact; the program also allows for "special projects." These are loosely defined opportunities that present breakthrough design potential, but may not necessarily fit the timing and purview of a course that takes place in the college's traditional fourteen-week academic terms. "Special projects" are usually comprised by hybrid design teams and research investigators recruited amongst students, faculty, expert advisors from other institutions, and alumni.

The design of the first generation prototype for the mobility system proposed for MCT fits the profile of this "special project" category within Designmatters. It is an ongoing effort at this writing, made possible by a small team of industrial design faculty at Art Center (which includes the lead industrial designer of the project, Kenyan alumnus Patrick Kiruki), collaborating closely with a team of engineers led by Winston O. Soboyejo, the Director of the Undergraduate Program at the Princeton Institute for the Science & Technology of Materials, Mechanical & Aerospace Engineering, Princeton University.

The system improves the efficiency of the loads carried by the camel caravans that navigate the rugged terrain where MCT operates, and the new long-range solar-powered

[9] Principals in the competition project team included Mariana Amatullo, Karen Germaine, Patrick Kiruki, Wendy MacNaughton, Elisa Ruffino, Geoff Wardle and Gaylord Eckles from Art Center, and Shannon Wreford- Smith, Molly Smith, Rose Kimanzi, and Rodgers Ade from MCT.
[10] The project was among the 105 finalists selected from over 2,900 proposals worldwide, http://web.worldbank.org/WBSITE/EXTERNAL/OPPORTUNITIES/GRANTS/DEVMARKETPLACE/0,,contentMDK:21213381~pagePK:180691~piPK:174492~theSitePK:205098,00.html.

refrigeration units proposed would eventually allow the clinic to deliver crucial vaccines and medicines that are currently inaccessible to distant recipients. The project blends relatively affordable technologies (use of flexible solar panels to power batteries for portable refrigeration units) with the application of advanced engineering and design, and an overall people-centered approach to service delivery. After several months of development that has taken place in the labs of Princeton, the prototype is now undergoing final stages of refinement for ease of assembly, stability, and durability. A number of sessions and fittings of the saddle system on camels at the Bronx Zoo (Fig.1) in March and April 2008 have in this regard provided key insight to the team.[11] Currently, the prototype is nearing the stage for field-testing in Sub-Saharan Africa, which is anticipated for late 2008. The potential lasting, transformational benefits of the innovations designed, and their broad application beyond the beneficial impact recognized by MCT, have already been identified by the Art Center-Princeton team and a number of prospective partners of the project.[12]

In retrospect, incubating this aspect of the Mpala Project beyond the Development Marketplace Competition has allowed the original ideas proposed to be designed in a robust way through the partnership with Princeton, with outcomes that can be hopefully replicated and adapted to other countries where similar terrain and remote communities are in existence. Ultimately, as Josephine Green from the Social Foresight and Innovation team of Philips points out when addressing the question of designing new healthcare solutions, *"the goal is to see this new health delivery system be successful, not primarily because of its technology but because it redefines the access and delivery of health and wellbeing in a way that makes sense socially and culturally to the various users."*[13]

3. Shedding Preconceptions to design a visually based health-education campaign

"The Mpala Project's success started and ended with the same idea: keeping an open mind. We began by asking the students to look inside themselves to try to gain an understanding of what they believed—about illustration, about semi-literate people, about people of Kenya, about nomadic tribes, and about themselves. This turned into a conversation that lasted the whole semester."[14] -Esther Pearl Watson, Faculty, Department of Illustration, Art Center College of Design.

This statement encapsulates the sensitive and inquisitive approach that the faculty team from the Department of Illustration at Art Center took in guiding a group of undergraduate Illustration and Photography students throughout a dedicated studio that

[11] Multiple testing sessions of the system at the Bronx Zoo have been occurring since March 2008. Data compiled by Niyi Olubuyi, Princeton University, in correspondence with author, April 25, 2008.
[12] In addition to field-testing planned with MCT staff in Kenya, Designmatters has partnered with Project Concern International (http://www.projectconcern.org), a development agency focusing on health care delivery to explore the adaptability of the system in other regions with similar challenges. The first round of testing will take place in partnership with the field office team of Project Concern International in Afar, Ethiopia.
[13] Josephine Green, *Democratizing the Future, Toward a New Era of Creativity and Growth*, (Koninklijke Philips Electronics N.V., 2007), p. 32.
[14] Martha Rich and Esther Pearl Watson, Eds. *Images Speak*, (Designmatters at Art Center College of Design, forthcoming in 2008), p. 19.

Designmatters facilitated for this component of the Mpala project during the Fall 2007 academic term.

With a very complex brief calling for the design of viable and visually-based health education tools for non-literate nomadic communities in Kenya, this project presents a good case study of the applied research methodologies that the Designmatters program advocates for in these "wall-less classroom" initiatives, which, in the words of Watson, require students to be "thinkers first, designers second." In the case of Mpala, as Ann Field, Art Center's Department Chairman of Illustration has remarked, the brief called for students to let go of their personal drawing styles to focus on what messages their images needed to communicate. In order to reach their target audience, students had to operate outside their own frame of reference, and go through the difficult process of *"unlearning so much of what they knew."*[15] Grounding this process of opening intercultural doors in a rigorous research framework was key to the success of this educational journey for the students, but also paramount to constructing media sensitive to the values and cultural framings of the communities at hand.

As point of departure for the research, field and user-centered data brought back by the lead designers of the competition team became a backbone of visual references and resources. The data was complemented by several sessions with the original competition team, and expert advisors in communication and media.[16] Key among them, Professor Doe Mayer from the Annenberg School for Communication and School of Cinematic Arts, University of Southern California, qualified the Mpala Project as *"an ambitious idea, in which students rose to the design brief and the research challenge."*[17]

Specifically, the brief for the Mpala project called for culturally appropriate HIV/AIDS awareness and family planning messages and media. Working in teams, students developed six distinct health education pieces that ranged from chalkboard schoolbooks with simple illustrations meant to show the benefits of family planning, to a canvas flipbook for MCT counselors to use in the field when instructing about safe sex practices (Fig.2).[18] All solutions had to be designed at the finished level of a solid first prototype. Considerations of affordability, durability, and sustainability dictated the materials and techniques that were ultimately selected to bring concepts to life. Students were asked to synthesize research and feedback from the advisors that supported the Illustration faculty team at Art Center, but also from MCT staff and counselors who participated remotely throughout the progression of the studio at several key junctures. From a pedagogical standpoint, all Designmatters studios have these strategic sessions throughout the conceptual exploration and development stages of every project; they serve as critical moments for students (and faculty) to run creative directions through a sieve of questioning, self-examination, and true listening. Wendy MacNaughton, the creative director of the competition phase of the project and a guest faculty in the Mpala

[15] Ibid., p. 85.
[16] The expert advisory team of the studio included: Patrick Kiruki, Art Center Alumnus, Product Designer; Doe Mayer, Mary Pickford Chair, University of Southern California, School of Cinematic Arts and Annenberg School for Communication; Wendy MacNaughton, Art Center Alumna, Graphic Designer; Kinoti Meme, Fuller Theological Seminary PhD student.
[17] Martha Rich and Esther Pearl Watson, Eds. *Images Speak*, (Designmatters at Art Center College of Design, forthcoming in 2008), p. 26.
[18] The campaigns included Notebook and Chalkboard, Impressions on Recycled Aluminum, Grandmother's Kit, Pouch, Slide-Viewing Device, Safe Sex Fabric Book and Safe Sex Flipbook, which can be found in Martha Rich and Esther Pearl Watson, Eds. *Images Speak*, (Designmatters at Art Center College of Design, forthcoming in 2008), pp. 37-81.

studio, stresses the transformative importance of this listening aspect of the process, and sums it up nicely when stating: *"The biggest challenge for creatives working in social design is to approach each project with fresh eyes and open ears."*[19]

Ultimately, beyond complex content, the collaborative framework of the Mpala project is characteristic of the increasingly multifaceted nature of projects in the Designmatters portfolio.[20] As attested by MacNaughton, it forces the experience of a certain openness, an element of surprise and vulnerability in the design process, what anthropologist Genevieve Bell, Director of User Experience within Intel's Digital Home Group, qualifies as *"humility [that] brings with it grace."* Suddenly, the fundamental criterion for successful outcomes rely in answering the question: "But does it work?"[21]

By the same token, as students become progressively connected with the issues and people they are to design for, a sense of real purpose and empathy develops. Sara Hofmann, a student in the Mpala studio speaks to this sentiment very eloquently: *"I was most challenged by coming up with a concept that works not only in a California classroom, but one that really helps people in Kenya. It was not about being concerned about style or personal artistic voice, but rather in finding a way to tell a story that is understood by another."*[22]

Whether the story that Sara and her teammates conceived achieves its desired impact is a question that awaits an answer shortly: all six of the health education prototypes produced by the studio are in the hands of MCT counselors and will undergo field-testing through fall.

There are many valuable insights to be gained from the Mpala project as a case study for the typology of projects that Designmatters at Art Center undertakes. From a pedagogical perspective, pushing students outside their comfort zones to experience the challenges and rewards of real-world constraints brings an unequivocal sense of empowerment and responsibility, a sense of "awakening."[23] From a broader perspective, such projects also allow students to establish connections and bridges between global and local concerns that ultimately make for better design outcomes.

Public Awareness Campaign on Climate Change

In collaboration with the Department of Film, Designmatters facilitates ongoing studios that produce public service announcements and integrated media campaigns on critical social and humanitarian issues. The campaign for climate change awareness produced in summer 2007 for premiere in September of that same year at the United Nations

[19] Ibid., p. 30.
[20] For further examples see UNICEF project: http://www.lulu.com/content/2523148 and Designmatters project profiles: http://www.artcenter.edu/designmatters/projects.
[21] Wendy MacNaughton, eds. *Images Speak*, (Designmatters at Art Center College of Design, forthcoming in 2008), p. 30, and Genevieve Bell, *"Be Naked As Often As Possible": Anthropogical Advice*, 2008 commencement speech, UC Berkeley School of Information: http://www.ischool.berkeley.edu/files/genevieve_bell_commencement_2008.pdf.
[22] Student Sara Hofmann in unpublished interviews compiled by Nancy Greystone, March 2008.
[23] Student Rawn Trinidad,ibid.

Department of Public Information (DPI)[24] represents an interesting counterpoint to the Mpala Project case study, and illustrates yet another dimension of the methodologies of the program.

According to Designmatters Producer, Elisa Ruffino, *"the potency of combining media-savvy young minds with proficient creative and technical production talent is so exciting because it can yield an especially compelling message as well as head-turning vehicle for its delivery."*[25] The PSA production studio allows students to research, conceptualize, develop, shoot, and edit into thirty-to-sixty-second spots that are dissemination-ready by the time the fourteen weeks of the academic term conclude. In any given term, the thematic focus of the studio varies and can be driven by a funded commission from an outside partner, or be the result of individual students' personal interests. In the latter case, Designmatters and the film faculty typically support students with key research resources and expert advisors, as they create public messaging of their own choice. The PSAs produced are subsequently matched to agencies that disseminate them.[26] Both scenarios have been equally successful in the distribution range and quality of the PSAs— and both are equally thrilling in presenting an opportunity for new social commentary and immerse the students in a process of activism.

In the case of the global warming campaign, the organizers of the annual DPI/NGO conference invited Art Center to contribute to the central theme, *"Climate Change: How it Affects us All," with a commission that was intended to be* somewhat "edgy" in tone, and be able to resonate with cable and network television audiences beyond the forum of the conference and the UN (Fig.3). Students were encouraged to develop messaging that focused on a sense of personal responsibility around the issue. As Ruffino remarks, the result overall was *"a very visceral reaction to this invitation. Students were excited to imagine their personal contribution to a global dialogue on a subject that is so ubiquitous in mainstream media. They had a lot to say, and best of all, possessed the tools with which to say it."*[27]

With comprehensive research on climate change, the students found certain threads and nuances that particularly resonated with them, both as individuals and as young members of a society flooded with multi-disciplinary discourse on the issue. The approach they took was often characterized by a sense of self-effacing humor that resonated with a demographic of peers that are certainly rather immune to 'do-good' commercials. The testimonial of Alice Park, the student director of a piece called "The G.G. meeting*,"* which depicts a group of individuals of various ages who come together in a mock alcohol anonymous meeting to wrestle with the mistakes of their daily actions, refers to a bold sense of confidence that Ruffino found in all student directors: "The piece is purely to stimulate our social consciousness on the topic of climate change. *Once in the ether, the easier and more willing people are to have an open forum on the subject, and take action… The concept lends itself to reflection and awareness on*

[24] Art Center is the first design school to hold Non-Governmental Organization status with the United Nations Department of Public Information since 2003. The College is also an NGO with the United Nations Population Fund and the Organization of American States.
[25] Elisa Ruffino, in correspondence with author, May 2008.
[26] A recent successful example of a student-generated concept that received international recognition is Jonas Mayabb 's "Fat Lane," a young director first prize award at the 2007 Cannes Film Festival and a piece optioned by Participant Productions in conjunction with the social action campaign for the motion picture "Fast Food Nation."

climate change in its lighthearted, self-effacing approach to the eminent issue, and with a sense of community."[28]

All four climate change PSAs produced as part of this studio represent a "best-case scenario" of an extremely proficient campaign that touched a nerve and transcended its initial outreach objectives and audiences, with broadcast by multiple partners, which included Participant Productions and "Inconvenient Truth" producer Laurie David's non-profit, StopGlobalWarming.org. In addition, the work has been screened as part of the 2008 "Green Screen Series" of the Film Society at Lincoln Center, New York and has received multiple accolades. The critical acclaim of one of the PSAs in particular, "Blowing Smoke" by Jonas Mayabb, is also an extraordinary testament to the very well honed messages and technical prowess of the work. Since its premiere a year ago, the PSA has picked up several advertising and filmmaking honors, including the top honor in the U.S., an Emmy from the Academy of Television Arts and Sciences.[29]

Conclusion

The Mpala Project and the Public Awareness Campaign for Climate Change are two distinct project case studies from the Designmatters portfolio at Art Center College of Design that demonstrate how design education can be aligned with a rigorous exploration of the great social transformations and global issues that are affecting the world today, to in turn generate tangible outcomes and real solutions that can make a difference in society.

Peter Drucker's definition of knowledge as "information that changes something or somebody--either by becoming grounds for action, or by making an individual or an institution capable of different and more effective action" [30] offers insight into the paradigm shift that the Designmatters initiative has generated at the college. Designmatters has enabled the "DNA" of the entire institution to evolve with a new emphasis on imbuing the educational experience with critical content and a sense of contemporary relevance and commitment. Indeed, "research transformed by action" could be the underlying motto of the initiative.

As an international competitive institution of higher education for the 21st century, and as an advocate for the larger role of design, Art Center's mandate is inexorably linked to the responsibility to chart new territory for graduates to be design leaders and to "lead by design."[31]

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[28] Alicia Parks in correspondence with Elisa Ruffino, March 2008.

[29] The four climate change PSAs produced for premiere at the United Nations DPI/NGO Conference, September 2007 and distributed throughout 2008 by the Film Society at Lincoln Center "Green Screens" PSA program and launched during the Live Earth world concerts simulcast, included: **"**Blowing Smoke**,"** directed by Jonas Mayabb (Film), Summer 2007, Winner of a 2008 Academy of Television Arts & Sciences' College Television Award, First Place, Outstanding Commercials Category and Winner of a 2008 Clio Award, Student Category; "Apathy," directed by Hugo Stenson (Film); "Moving Day," directed by Gregg Casson (Film), Winner of the 2007 Mobius Award, Student Category, Television Winner of a 2008 Clio Award, Student Category, Television/Cinema/Digital and Winner of a 2008 Silver ADDY Award (Student Category, Los Angeles city level); "The G.G. Meeting," directed by Alice Park (Film), Winner of a 2008 Silver ADDY Award (Student Category, Los Angeles city level); 2008 Gold ADDY Award (Student Category, district level); 2008 National ADDY Award Finalist (Student Category judging forthcoming).

[30] Peter F. Drucker, The New Realities (London: Mandarin Press, 1990), p. 242.

[31] The term "leadership by design" is one often used by Richard N. Swett, one of the few ambassador-architects in United Sates history. For his comprehensive account of architecture's broad contributions to

The Changing the Change Conference offers an ideal platform and community of practitioners and institutions among which to share this vision.[32]

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Fig. 1: Saddle and solar panel system tested with Princeton University Personnel and Bronx Zoo staff, March 2008.

society, see Leadership by Design: Creating an Architecture of Trust, (Atlanta: Greenway Communications, 2005).

[32] The author wishes to acknowledge Art Center College of Design colleagues Erica Clark, Senior Vice President, International Initiatives; Elisa Ruffino, Designmatters Producer and Senior Associate Director, International Initiatives, and Hannah Huang, Research Coordinator, Designmatters and International Initiatives, for their ongoing contributions to the Designmatters initiative and this paper.

Fig. 2: Designs for Mpala Health Education Campaign, (Left) canvas flipbook, (Right) chalkboard and notebook.

Fig. 3: Image from the award-winning Public Service Announcement, “Blowing Smoke,” one of a series of four PSAs on the topic of climate change and personal responsibility, commissioned by United Nations Department of Public Information, September 2007.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

An Industrial solution for Kenya and Africa

Using home-grown ideas to create sustainable livelihoods

Lorraine Amollo[1]

Abstract

The poor performance of large scale industries that is characteristic of most African countries has led to the emergence of micro and small scale industries. These industries remain small and uncompetitive and therefore do not offer sustainable livelihoods.

African Governments and other stakeholders have failed to create an enabling environment for these small industries to grow. On the other hand, the efforts at large scale production have been mostly fruitless.

This paper looks at two case studies of small scale producers with the aim to explore their potential to grow into sustainable Medium sized industries. In its conclusion the paper proposes ways in which stakeholders can forge the path towards industrialization and in so doing create sustainable livelihoods.

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1. The industrial situation

In Africa, the Western model of industrialisation has not met with much success. This remarkable failure at industrializing that is characteristic of most African countries has been blamed on a host of problems ranging from poor governance to the transfer and use of inappropriate technologies. The strategies that governments have adopted in an effort to industrialise have been proven to be unsustainable.

The collapse of the manufacturing industry in Kenya is a case in point of these failed efforts. This failure has further been two-fold as industrialisation efforts have been unable to create adequate employment and have also led to the loss of employment opportunities in the indigenous industries. Pottery production is an example of a once vibrant industry in many rural areas in Kenya. This indigenous industry provided local communities with containers used for preparation and storage of food. It was an off-farm activity that supplemented the incomes that women received from subsistence farming. Today, plastic wares and metal containers that are longer lasting and therefore considered cheaper and also seen as a sign of modernity have replaced the traditional earthenwares. The plastic and metal wares are produced in factories that require few employees and use imported raw materials and technologies. Even cheaper are finished wares that are imported into the country from industries abroad.

2. Transfer of Technology

The transfer of technology world wide has been viewed as one of the main agents necessary for economic growth. The acquisition of technology and its proper adoption should lead to production growth. The invention and creation of these technologies have however overwhelmingly remained the stronghold of the OECD countries. Developing countries therefore find themselves at the receiving end of these imported technologies. (Hoekman et al 2004, 1).

As earlier mentioned the transfer of inappropriate technologies to Africa has been blamed for the poor performance of large scale industries. The term appropriate technology also referred to as intermediate technology was originally a concept involving the application or adaptation of technology to fit a particular context (Jeans 1999, 69-170). The popularisation of the concept of Intermediate technology is attributed to Eugene Schumacher in the 1960s who called for the use of modern technology to solve the problems of creating work rather than concepts of efficiency and increased outputs that displace workers. Its emphasis is on the needs of people rather than products (Heskett 1980, 10). Unfortunately, almost all new technologies are designed to meet the demands of industrialised countries. Technical expertise today that is geared towards large scale production is unaware of the technological problems of the Small and micro industries. (Jeans 1999, 169-170).

Another argument for the poor transfer of technology is attributed to the fact that the nature of technology has not been fully understood. Viewed as any other commodity in a free and fair market, then technology would be easily transferred and used fittingly from one place to another. This theory however assumes that technology merely consists of techniques and methods that are created in developed countries and transferred to developing countries at little or no cost. However the reality is that technology is complex and cannot be expressed as the sum of the material inputs and technical know-how. In light of this then technological transfer to developed countries needs to be looked at in the broader context whereby the receiving countries need the capability to make use of the acquired technology, absorb it and adapt it local conditions. (Archipugi and Pietrobelli, 2002, 862-863).

3. The informal sector

The consequence of failure to industrialise has led to the abundance in Africa of small scale industries most of which have remained informal. In Kenya, as in most of Africa the informal sector has as a result attracted much attention. Governments as well as a host of Non-governmental organisations have become embroiled in this hot subject with little or no benefit trickling down to the small scale producers.

The term Informal sector was first used by Keith Hart whose studies were focused on the work done by Frara migrants in Accra, Ghana. It was however in Kenya that the informal sector was first regarded as a policy priority in the employment mission done by the International Labour Organisation in 1971. In Kenya however, it is increasingly became more common to use the term 'Micro and Small Enterprises (MSEs) of the *Jua Kali* sector' or 'Non-farm activities' in the rural areas. The use of Jua kali as a term dates back to the 1980s when the then minister of Technical training and Applied technology endorsed the use of the term *Jua kali* sector in place of the informal sector in 1988 (King 1995, 24-30).

The term 'Jua Kali' is Swahili for 'Hot sun' referring to the open air working conditions of the entrepreneurs. Most Jua Kali industries start off and remain as informal enterprises as their owners often cannot afford the expensive and rigorous process of registering with the relevant Government bodies. This informality means that the *Jua kali* businesses have found it hard to access business development services or export markets as compared to the formal and larger industries. (King 1995, 24-30). The *Jua Kali* producers as result remain poor and their businesses small and uncompetitive. Though the Government has recognized the potential of the *Jua kali* sector as an employment opportunity for many Kenyans, it has failed to create an enabling and sustainable environment for these micro and small industries to grow.

Policy makers in the government as well as Non governmental organisations (NGOs) and donors have adopted appropriate technology and business development as the way forward in the effort to empower the small scale producers. The Government of Kenya (GOK) has set up several departments under the ministry of Trade and Industry aimed at better serving the needs of small scale businesses. Further, the GOK has written several policy papers such as sessional paper number one of 1956 and number two of 1991 and 1992, all these in relation to the Jua kali sector. In its latest efforts, the GOK has set a ministry of industrialisation that is wholly focused on propelling Kenya to industrilisaton in the near future.

4. Jua kali producers

Most of the businesses in the *Jua kali* sector are family-based with skills acquired through traditional apprenticeship. The techniques used in production are simple and do not require complex machinery. The informality of the *Jua kali* makes it easy to set up businesses, as they require minimum start up capital. The negative side of this is that there is a proliferation of enterprises that remain small due to high competition and lack of investment opportunities.

A study done by the International Labour Organisation on the Jua kali, sites constraints such as inadequate skills, technology, support services and infrastructure. The National MSE baseline survey 1999 shows that the major constraint facing MSEs nationwide is lack of market. Numerous researches endorsed by both the GOK and NGOs have been carried out on the MSEs. It would therefore seem that a lot of attention is being paid to this sector. The GOK particularly in all its policy papers, places a premium on its intervention efforts to upgrade MSEs by creating an enabling environment for their establishment and growth. Government plans however continue to be criticised for having frameworks that are too general and unimplementable. These frameworks are hardly ever followed by budgetary allocations or the institutions to implement them (King 1995, 35-50).

The interventionist policies adopted by both the government and the NGOs have been misplaced and have achieved poor results in improving the livelihoods of *Jua kali* producers. The NGOs have over the years funded micro-enterprise development heavily with the result that certain projects have become heavily dependant on this assistance. This over dependence on external support causes entrepreneurial set ups to collapse as soon as the external support is withdrawn. Other forms of support have been the provision of training programmes for the entrepreneurs. In craft training in particular, academic based programmes that have no regard for economic viability of the craft, renders trainees unable to engage in lucrative business activities when they enter the real market (King 1995, 35-50).

Inadequate access to markets is another major set back for the *Jua kali* producers. In Kenya, poor access to local markets is partly caused by a narrow product range which leads to high competition and market congestion. This is evident from the horizontal rather than the vertical growth of most enterprises. Another set back is poor product design and packaging, low quality of products, poor pricing and lack of product improvement. In the international scene, the *Jua kali* producers face greater challenges such as lack of information and access to external markets which prevent them from exporting their products. They also lack the financial and promotional support from the government to enable them to access external markets.

5. Another attempt at Industrialisation

On the other hand, the Government of Kenya has since independence tried its hand at large scale industrialisation, an effort at which it has singularly failed. In one of its renewed attempts, it enacted an Act of parliament that saw the setting up of Export processing zones (EPZs) in various parts of the country. The EPZs provided incentives such as 10 year tax withholding, quick project approval and provision of machinery and business inputs among other things.

According to the Cover story on *Marketing Africa* of June 2005, though the EPZs have attracted investors to Kenya, they have been blamed for encouraging production of specific export products as well as importation of raw materials, technology and expertise. There are therefore no backward or forward linkages between the EPZ industries and local industries. In 2008 as has been the case in other years, the workers at some of the major EPZ factories have gone on strike over poor pay. They are paid minimal wages with little or no benefits. The owners of these factories therefore make a large killing from their profits which they neither share with the government as they have tax waivers nor with their underpaid unskilled workers. Certain industries such as horticultural farms that were hitherto performing well before the establishment of the EPZs have also joined the scheme in an effort to increase their profits by paying less tax.

The Government has therefore concentrated its efforts in creating large scale industries without taking into account the resources available in the country or the benefits that would accrue from such a venture. This focus on efficiency and high productivity is a Western concept of Industrialisation that largely makes use of non-renewable sources of energy and is geared towards catering for the needs and wants of a consumerist society. Africa on the other hand, struggles to adopt these western concepts, which do not absorb the large labour force that most African countries boast of.

6. Two cases of small scale producers

In light of these facts on the situation of Industrialisation in Kenya and Africa at large, this paper uses two case studies of Jua Kali enterprises in Nairobi and Kisumu, Kenya to explore their potential to grow into medium sized industries. The two enterprises are *Paro* in Nairobi which produces pottery and KICK in Kisumu which mainly engages in metalwork. The two cases are considered small industries as they are owned and managed two individuals in the case of Paro and no more than 10 shareholders in the case of KICK.

Paro cultural project is an entrepreneurship that deals in the production and sale of earthenware and is owned and run by two men. The business has been in existence for four years to the present and has its workshop in Nairobi. It is registered as a youth project with the ministry of Gender, sports and Culture a move which allows the enterprise to operate without the necessity to file tax returns as would be the case if it was a registered company. The enterprise is also registered with the Local authorities as is required of all businesses that operate in the city.

The two potters at Paro are engaged in the pottery business to generate income for their families and therefore strive to make it a profitable endeavor. Both potters also agree that self-employed is more fulfilling as they reap the fruits of their own labour. They intend to expand the business in future and thereby provide employment for others. These two needs of generating income and achieving self-fulfilment seem to be the main drive for engaging in the pottery business. Prior experience in the pottery industry is also a strong reason for choosing pottery as a business. Both potters are from the Luo community in the Nyanza province of Kenya where pottery has long been an indigenous vibrant industry. This has been attributed to the location of the province in the Lake basin area that is abundant with the raw materials necessary for the production of pottery.

The type and design of wares the potters at Paro produce is largely conditioned by their customers' needs as well as the availability of materials and technology. The potters mostly work on the orders they receive from customers most of whom come with their own specifications. Most of these customers want decorative items though some use the wares for cooking and serving food. It is becoming common in the catering business in Nairobi to use earthenware in serving African cuisines to create an 'authentic' traditional feel. Paro has therefore benefited from this interest as they have sold good number of there wares to several restaurants around the city.

As mentioned earlier, the methods of production used at Paro are largely rudimentary as they use basic tools common to traditional potters. The potters at Paro have gone further and developed and constructed larger turn-tables and a charcoal kiln mostly from recycled materials. The kiln is however too open and therefore burns alot of charcoal. The potters have also over the years developed a recipe for mixing clay with feldspar and kaolin to allow the wares to fire at higher temperatures and are therefore not are breakable as the traditional wares. Through interaction with customers, the potters have developed a range of products such as dinnerware and water coolers that are not produced in the rural areas.

KICK Trading is an enterprise based in Kisumu city, in the lake basin region of the country. It is a registered company with shareholders most of whom are the artisans who produce the wares that the company deals in. The business is managed by Isaac who is experienced in product design and development as well as business management. This sort of arrangement is unusual in the *Jua kal*i sector as most businesses are small and owned by one or two individuals who also work in the enterprise. KICK Trading has offices and a show room where the artisans can rent space and display their wares for sale. A small workshop space is also available for artisans to do their work. Most of the artisans who produce for KICK are however based in their own workshops in the nearby Jua kali market.

KICK trading deals in a variety of products most of which are decorative items made in recycled metal, wood, clay, water hyacinth and recycled paper. Recycled metal has long been used as a raw material in the Jua kali business with its products ranging from cooking pots commonly known as sufurias and metal suit cases that are popular with boarding school children

as they are not easy to break into. Most the products at KICK Trading are made of recycled metal which is obtained from the soda bottling company Cocacola. One design that is popular with their customers is smaller versions of the metal suit case that now serves as a decorative item. As the sheets of metal from the bottling company comes with the brand design of Cocacola products, most Jua kali artisans prefer to finish off the suit cases with spray paint. At KICK however, the artisans leave the finished product with the Cocacola brand designs which gives them an identity that soda drinkers anywhere are familiar with.

The miniature suit case idea also evokes nostalgic feelings for any Kenyan who had to drag their big and heavy metal suit case to school every new term. Other innovative products at KICK are pen and file holders, jewellery as well as danglers all made in metal. Some of these are painted decoratively to add variety to the range. The use of water hyacinth fibre as a raw material in furniture making is also innovative. Hyacinth is a weed that is currently choking the shores of Lake Victoria and has greatly hampered fishing which is the main source of livehood in Kisimu and its environs. Efforts to rid the lake of this weed have so far been futile. Its fast growing nature makes it spread at alarming speeds. Most lakeside dwellers therefore view hyacinth as a nuisance and are not keen to see it at a ready source of fibre. A few artisans though like those working with KICK are experimenting with hyacinth and earning an income from it.

7. Potential

It is clear that the two enterprises discussed above have great potential to grow into medium sized enterprises. They both exhibit a good level of innovation by experimenting with new materials and improving on already existing designs. Paro potters are creating a niche market for themselves by targeting establishments such as restaurants which have thus far provided a relatively decent source of income. At KICK, the artisans have developed a range of products that are both appealing and evocative to their customers. In both cases, the entrepreneurs have made efforts to access the export market with some measure of success. Exportation has hitherto proven to be a daunting task for most Jua kali producers in the country.

The use of recycled materials as is common in Jua kali production mitigates to a large extent the degradation caused to the environment by the manufacturing process. The methods of production are also labour intensive and require little or no burning of fuel as is the case in metal work. In pottery however, the use of kilns to bake the wares necessitates the burning of charcoal or wood which is a non-renewable source of energy. One way would be to design a more closed, energy efficient kiln that uses less charcoal.

8. Proposals

Having demonstrated the innovative potential that Jua kali producers possess through the two case studies with potters at Paro and metal workers at KICK, the paper puts forward certain proposals that would act as catalysts to this innovative process. The proposals identify some of the stakeholders in this process as the:

- Government(s) of Kenya and other African countries,
- Researchers and research institutions such as Local universities and Non-governmental organizations engaged in active research,
- Market movers such as local distributors and exporters
- *Jua kali* producers themselves

The above named stakeholders are best placed in their respective capacities to creating an enabling environment that will encourage the growth of small scale industries into Medium

sized enterprises that are competitive and lucrative. This would create sustainable livelihoods for the entrepreneurs as well as provide opportunities for employment for a larger population.

The proposed measures to be taken in an effort towards sustainability are:

- Provision for accessible and affordable licensing and registration for *Jua kali* entrepreneurs by the relevant Government ministries. Currently the registration process is arduous and expensive and most entrepreneurs prefer to remain informal with the result that they have little or no access to business development services such as credit facilities or training. A one-stop-shop process of registration that is also cheap would encourage the producers to formalize their businesses.
- Research and development programmes by Local universities and other research institutions to improve *Jua kali* production and entrepreneurship. Research into the extrinsic and intrinsic processes that affect and influence Micro and small entrepreneurship would provide possibilities for greater innovation through experimentation and collaboration. Presently Research institutions such as universities operate in isolation as they do not actively involve other stakeholders into the research process. Programmes that would bring together researchers and Jua kali producers in a mutually collaborative process would provide a platform for the improvement of design and production processes as well identify marketing opportunities for their finished products.
- Use of Indigenous Knowledge systems to design products for local use and export. The exploitation of indigenous knowledge has been ongoing but it has brought little benefit to the locals who own the knowledge. It is therefore necessary to allow the locals who own the knowledge systems to also own the process by which these indigenous knowledge systems are exploited. This can be done by involving the locals in the marketing and distribution of products as well providing information that would enable the local producers to access export markets.
- The use of recycled materials and renewable sources of energy as sustainable means for Jua kali production. Jua kali producers have become adept at using recycled materials to produce their wares. This can be attributed more to the availability and cheapness of these materials rather than the producers' sensitivity towards preserving the environment. It would be important therefore to provide information on the need and benefits of preserving the environment through recycling and efficient use of energy.

These proposals are in no way conclusive and should be buoyed on a foundation of good governance which has sadly been lacking in most African countries including Kenya. It is important for governments, the academia, the civil society and private enterprise to rise to the occasion and forge the path towards industrialisation for Kenya and the rest of Africa by carrying out their respective roles as well as collaborating in ventures that will improve the lot of the Micro and small scale entrepreneurs who form a majority of the population.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Beyond Abundance

Motivations and perceived benefits underlying choices for more sustainable lifestyles

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Abstract

The paper presents the results of a study that explores the implications of responsible consumption for sustainable product design. The study forms part of a larger research program that examines material culture and design and production for sustainability. Within this present study, information gathered from citizens attempting to follow sustainable lifestyles shows that the adoption of sustainable consumption patterns is not only motivated by altruistic and environmental considerations, but also, significantly, by perceived personal benefits, including an expected increase in personal well-being. These motivations, together with how they unfold into preferences for particular product characteristics, are discussed. The paper underlines that the understanding of such motives may warrant more emphasis as it seems to represent a key incentive for change.

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1. Introduction

The need for 'lighter' patterns of consumption, particularly in industrialized countries, is widely recognized as an essential step towards a more sustainable future (United Nations 2002; OECD 2002). The idea that people's choices, behaviours and lifestyles play a vital role in moving towards more sustainable patterns of consumption in particular, and towards sustainable development in general, is a point of agreement in international environmental policy debates (Jackson 2004).

For the individual, participation in the vital but still fuzzy project that is 'sustainability' can be realized by adopting more responsible consumption patterns. Broadly speaking, responsible consumption refers to minimizing the negative environmental and socio-cultural impacts related to consumption choices, the amount of goods and/or services consumed, and the acquisition, use, maintenance and disposal of a product. It involves consuming less and consuming differently (Cooper 2000). Furthermore, it could be said that sustainable consumption requires "getting more with less, not more stuff but more satisfaction" (Manno 2002, p. 67). However, UNEP suggests that "sustainable consumption is not about consuming less, it is about consuming differently, consuming efficiently, and having an improved quality of life" (UNEP 2000). One could be sceptical with respect to such a statement, where 'differently' mainly refers to the consumption of more eco-efficient products and does not necessarily include consuming 'less'. Indeed, "[e]vidences suggest that environmental gains from technical improvements in product efficiency have historically been outweighed by an overall increase in consumption" (Carley, Spapens 1998, cited by Cooper 2000, p. 51). As discussed by Fuchs and Lorek (2005, p. 261), "[t]here is a substantial amount of controversy regarding our ability to achieve sustainable consumption on the basis of improvement in efficiency alone".

More directly with regard to product design, sustainable consumption " […] involves rethinking how needs are met and products are conceived" and " […] will involve finding a mix of products and services through which consumers will be able to buy less, use less, and dispose of less without suffering a loss of well-being" (Cooper 2005, p. 50). Within the larger research program, of which this current study is a part, relationships are emerging that bring these issues together: getting more satisfaction from goods, consuming less, recovering and maintaining goods locally, re-presenting older goods in new ways, and re-designing products for ease of upgrading (Walker 2008a; Walker 2008b; Marchand and Walker 2008; Walker 2007; Dogan and Walker 2006). These directions represent a significant challenge and offer new opportunities that recognise not only the functionality of 'things', but also how we relate to them.

Responsible consumption implies important lifestyle changes and the development of different attitudes towards the material world. With regards to lifestyle choices, this is an area where design can play an especially important role. Imagining the unknown, visualizing alternatives, and proposing desirable scenarios and solutions are the areas of skill and expertise that characterize the profession. Design has a significant contribution to make, since it has the potential to envision new practices and ways of organizing daily life (Manzini and Jégou 2003).

To develop such solutions and to present them in ways that are both feasible and appealing to a broad public, it seems essential to understand the motivations that have already led some people to adopt more sustainable lifestyles and the nature of those products they especially appreciate. These understandings can contribute to the development of design solutions that are in accord with the needs and preferences of people already choosing to consider responsible consumption. Potentially, they can support new initiatives among others by offering alternative forms of products, perhaps in conjunction with a locally available service, and by positioning them in a way so they gain added value with regard to social, environmental and individual benefits.

This paper presents results from a qualitative study conducted among citizens who, on a voluntary basis, have decided to diminish their levels of consumption and opt for more ecologically sound products. The study examined motivations underlying the re-orientation of their lifestyles and how these changes in lifestyle and attitude were expressed through product preferences. An important assumption underling the research is that, by seeking a better understanding of the positive changes that are currently part of the social fabric (as is the case with responsible consumption initiatives), design has the potential to support these transformations and to participate more actively in the project of sustainable development.

In the second section, the methodology used to gather the information is presented. In the third section, the results of the study are presented. These show that the respondents choose to adopt more responsible consumption practices not only for eco- and socio-altruistic motives, but also because of perceived individual gains. The relationship of these perceived benefits to preferences for particular product qualities is described. In section four, the authors discuss the potential advantages of simultaneously promoting the environmental, social and *personal* benefits of responsible consumption and sustainable lifestyles in general. Finally, section five outlines the potential design implications of giving greater recognition to the self-interest motives behind moderating our consumption habits.

2. Motivations Behind More Sustainable Lifestyles

The research program, of which this present study is a part, examines material culture and *design and production for sustainability* from two principal perspectives: from the design and production side, including the integration of scales of production so that product production, maintenance, upgrading and recovery can be achieved at the local level; and from the design and consumption side, which investigates different factors driving consumption and lifestyle changes. The various strands within these two broad, integrated themes, include design-centred research as a significant element of the methodological process and in which the development of many notional or conceptual designed artefacts are created, as an essential aspect of the knowledge advancement. Hence, the research program explores new interpretations of product production that begin to include 'localization', perceptions and values of what might be termed responsible consumers, and these are integrated via concurrent engagement in the activity of designing.

The goals of this present study were a) to gain insights into what might be termed a responsible, sustainable material culture by seeking to understand the choices, preferences and perspectives of identified sustainable consumers, and b) to use this information to identify key implications of sustainable consumption for the design of products, especially in the areas of sustainable product design and aesthetics. The study sought to understand the potential of sustainable consumption and lifestyles, the lessons it holds for product design and production, and its implications for material culture. The paper focuses on one element, among others, that emerged from this study, that is, the observation of self-interest motives for responsible consumption (RC) and lifestyles and its relationship to product preferences. Broader findings are presented in an earlier paper (Marchand and Walker 2008).

In order to gain insights among citizens who choose to integrate ecological considerations in their consumption practices, and more globally in their daily life, research has been conducted among citizens who practice some form of simple living or voluntary simplicity (VS). From a research point of view, voluntary simplicity presents a number of interesting characteristics: its adherents constitute a recognized group with a relatively well defined culture; they present themselves as responsible consumers; the movement is documented in academic literature (Grigsby 2004; Zavestoski 2002; Shaw and Newholm 2002) and people who adhere to voluntary simplicity principles are accessible (e.g., through organizations, conferences, activities, and

various discussion forums on the internet). As described by Porritt (2005, p. 11), the VS philosophy can be expressed through: "[…] maximizing one's quality of life while minimizing one's dependence upon a wasteful, energy-intensive standard of living […]". Voluntary simplifiers, who not only consume less but also consume in a more environmentally and socially responsible manner, can provide interesting and important insights for research into product design for sustainability.

Many authors (Reisch and Scherhorn, 1999; De Graaf et al. 2001; Maniates 2002; Etzioni 2003; Porritt 2005) see voluntary simplicity as a response to consumer culture that holds lessons for a more viable, sustainable society. With regard to what might be termed 'regular consumption' and 'regular living' in contemporary, industrially developed countries, voluntary simplicity adepts are more likely to adopt attitudes and practices (based on a study conducted by Craig-Lees and Hill 2002) that include:

- limiting their consumption in terms of the volume and quantity of products purchased;
- choosing more socially and ecologically sound products and/or services (including more 'local' products;
- using product-service-systems;
- repairing, exchanging, and creating products;
- investing in their communities;
- consuming less meat and processed food;
- favouring natural materials and organic food;
- favouring living in dense cities or in rural areas (rather than in suburbs);
- placing less value or importance on work as an activity while still wishing to have a meaningful and interesting job and/or reduced work hours;
- practicing 'low' environmental impact leisure activities.

Firstly, the study included participant observation through researcher participation in existing voluntary simplicity group meetings at which people discuss, among other things, their experiences in relation to responsible consumption and sustainable lifestyles. More than forty (40) meetings of two hours duration were attended, representing over eighty (80) hours of participant observation. Field notes were taken as a means of data collection. Belonging to the tradition of ethnography in anthropology, participant observation requires that the researcher becomes a participant in the culture or context being observed. This first phase of the study permitted the examination of different profiles of people interested in voluntary simplicity lifestyles and responsible consumption. It allowed the identification and documentation of comparable and contrasting profiles and led to the AAAA Model of Sustainable Consumers (Marchand, Walker & De Coninck 2004, based on Hansen and Schrader 1997 and Cooper 2000):

- **Abstention**: refraining from consumption or, in some cases, consuming less;
- **Attitude**: regarding consumption that exceeds one's basic needs as rather negative;
- **Awareness**: choosing products on the basis of their broad-based ecological qualities;
- **Alternative**: identifying substitutes to traditional consumption (e.g. switching from product to service; borrowing instead than buying).

Secondly, in-depth semi-directed individual interviews were undertaken with eleven (11) participants who especially fitted the AAAA Model in their attitudes and reported actions.

Simplifiers who report consuming less while not significantly opting for greener products and/or practices, as well as those likely to opt for greener goods while not considerably reducing their level of consumption, were not included in the individual interview stage. The interviews, of one to three hours duration (depending on whether respondents wanted to meet once or twice) were recorded and transcribed, and analyzed using qualitative research methods. The interview guide used to conduct the semi-directed interviews focused on the following themes:

- the ways in which respondents experience responsible consumption and their underlying motives;
- the place functional objects occupy in their lives;
- the qualities they value in functional objects;
- their representations surrounding the concept of sustainable product;
- the way positive aesthetic experiences are lived;
- the resulting visual culture.

To stimulate exchanges with the researcher, participants were invited to photograph objects they value. In addition, products and/or photographs of products were presented to the interviewees, and they were invited to comment on the meanings and values they felt were embodied in the object's formal qualities, and the relationship of these meaning and values to sustainability.

With the permission of the participants, the interviews were recorded using an audio recording device. These data were transcribed and coded following themes emerging from the data (eg. search for autonomy; time in relation to object; products' affordance; life span; relevance and purpose of objects; source and origins; quantity of material; etc.)

Based on the key informant interviews conducted, and the work of other researchers in the field, the following section describes some self-interest motives that have been identified as important incentives for engaging in responsible consumption patterns. Links are considered between these motives and particular product characteristics that are appreciated by the interviewees.

3. Perceived 'Individual' Benefits and Product's Qualities

"To have useless things, or semi-useless things around, it clutters my thoughts"

"I think that in some ways, getting rid of things you don't really need allows you to gain the time you were using to maintain this stuff, so primarily it gives you more time to spend with people"

"You need to think in terms of durability and not to be too dependent on money and having to work like a fool in order to afford everything the companies try to make you believe that you need."

"Stuff is complicating life"

"Commuting by either biking or running to my work allows me to incorporate a way to get some exercise while also saving money"

> *"The more you want time for yourself, the less you need to spend. The more you spend, the more you need to work and the less time you have, so for me luxury is not about a gold ring or a gold watch, for me luxury is time"*
>
> *"In thinking about my relationship with things, I want to be in charge, I don't want them to run my life, it is there for me to use"*

Among key informant interviewees, perceived individual or family benefits acted as important motivations for adopting sustainable modes of consumption, and more sustainable lifestyles in general. As reported by participants, such lifestyles are considered as ways of achieving a better quality of life while participating in the larger project of sustainable development. This finding is not surprising since this position is part of the voluntary simplicity culture to which the interviewees belong. Here, it is important to remind the reader that this paper focuses on the *self-interest* motives for responsible consumption and that participants' commitments to responsible consumption also include significant eco- and socio-altruistic motives that are not discussed here.

With regard to self-interest or perceived individual benefits, the following elements emerged from the individual interviews as central factors:

- having more time;
- reducing stress;
- having a healthier, balanced lifestyle.

Among these respondents, consuming and possessing a 'large' quantity of goods, and the associated dependence on work and/or credit to acquire these goods, as well as the pursuit of income growth, is perceived as having severe negative impacts on the individual, family, and on the quality of social relations with others. Such motives for 'downshifting' are well documented by authors such as Juliet B. Schor in *The Overspent American: Why We Want What We don't Need* (1998) and by Tim Kasser in *The High Price of Materialism* (2002); both authors discuss the hidden costs of high consumption. As mentioned above, based on the interviews conducted, these motives are linked to product preferences and attitudes towards the material world.

The eleven participants interviewed all said that they regard possessing a large number of products as a source of stress because these products have to be maintained and repaired and, in addition, protected. They stated that having 'too much' is a burden because of the energy and time required to care for and care about these possessions. All respondents reported trying to reduce the number of objects they possess by giving away goods they don't use or that aren't important to them, or by avoiding or reducing purchases to minimize accumulation.

> *"Responsible consumption is also a way to tend towards a reduction of purchases and, more globally, a reduction of everything that is material around you, I think we all need to do this because we are cluttered by a bulk of objects"*

When acquiring products, they tend to prefer objects with a limited number of features. 'Simpler' objects, characterized among other things as those offering less features and options than most commercial mass-consumption products, are perceived as less likely to break and, therefore, less likely to require repair or replacement. Objects offering fewer but carefully selected features and options are appreciated.

> *"In general I try to avoid objects full of gadgets of superfluous options and I try to take the ones that are as simple as possible […] in terms of functions and accessories, sometimes I will go with the middle because some functions are sometimes interesting, but usually I take those that are as simple as possible"*

Participants were more likely to rent objects and to make use of product/service systems, such as car sharing or children toys rental services. The car sharing system was presented an option allowing them to benefit from the utility of a car when needed while investing less energy, money and time in the different aspects of its maintenance. One participant also mentioned a

service he found very interesting, and to which he planned to adhere, which allows citizens to rent art pieces created within the community and to exchange them every month or two with others subscribers. He appreciated that these artefacts are becoming accessible through this service and that this service challenges the traditional 'owning' and 'possessing' culture, while supporting the local artistic community. In such ways, participants sought alternative ways to respond to their needs.

> *"The first question that I ask myself is do I really need this and can I rent it instead of buying it, can I borrow it, and often finally the answer is yes, there are other ways, we don't always need to go and buy a product"*

In relation to time, as they reduce the level of their consumption, and by extension their expenses related to the consumption of goods, respondents commonly express a feeling of being less dependent on work and income. Several people reported having shifted from a full-time job to a part-time job or had reduced their working hours – all in an attempt to overcome the work/spend cycle. Partly because alternatives are not easy to find, but also to reduce expenses, 'do it yourself' (DIY) appears to be a popular practice among respondents who, for instance, report being inclined to make food from basic fresh produce, and make, as well as repair, their own products and take pleasure and pride in doing so. While the creative interventions of participants with regard to objects are modest, untrained and amateur - and therefore, in comparison to more 'designerly' examples might appear inept or undistinguished - their benefit and contribution does not lie so much in their professionalism or refinement as objects but in the fact that they are user-generated and represent an individual, conscientious counter-response to consumerism.

> *"If you work a lot, you may get a lot of money but […] you don't have time at home. When you decide to evaluate what are your real needs and how many hours of work are necessary to meet these, with a part time job, you can have enough for everything that you really need and then you get time with your family, you get some time to make things that you will not buy because you have time to make them […] It's a different way to see the relationship between work, time and money."*

With regard to second-hand goods, some interviewees participate in locally organised goods exchange groups. For example, one respondent uses *FreeCycle*, a platform available on the Web that allows people to give and acquire products for free in their geographical area.

> *"If we are making less money then we are almost forced to be more creative in the objects, the things and the way we are consuming"*

Participants share a preference for products that they perceive as long lasting, which can reduce the need for product replacement. On this topic, one respondent suggested that designers should create products that can evolve and be updated. Products designed for one specific use, in contrast to multifunctional products, are perceived as more likely to last over time. Although they report preferring "products that do one thing but do it well" as one participant has put it, in turn, many specify not hesitating to use objects for functions other than the initially intended one. For example, one respondent, who preferred having fewer objects in her kitchen environment, but used them in different ways, explains using the lower part of a cake tray to serve vegetables or other foods. She also uses a self-standing pasta and vegetable colander as a fruit bowl even if she has to remove the fruits from it when needed for the intended function of the object. She was directly pointing out that she can do 'more with less' and that, in many cases, only conventions prevent us from transforming object functions so as to respond to our needs with fewer goods.

> *"Commercials are trying to sell things to do a function that could be done with stuff that we probably already have"*

Finally, and in sum, throught the interviews, participants expressed the idea that consuming in a more sustainable way plays a positive role in the pursuit of the 'good life' at the level of the individual. Before presenting some potential design implications related to greater acknowledgement of self-interest motives for responsible consumption, the next section offers a

brief perspective on the notion of self-interest as an important factor for RC, together with more eco-altruistic and socio- altruistic motives, as shown during the interviews. This notion of self-interest appears to be a somewhat sensitive issue in the context of sustainability because it can be perceived as a cause of our underlying environmental and social problems.

4. Self-Interest and Altruism

According to De Young (2000), self-interest is traditionally seen as a major source of environmental problems. He reports that this 'presumption' was central to much of the early research on environmentally responsible behaviours. Self-interest was strongly associated with the egocentric nature of humans as "[…] gain-maximizers, having evolved to consume resources with little or no concern for efficiency, to pass waste and costs on the others, and to form small groups that exclude and neglect the interest of others" (p. 514). These behaviours would seem to be in stark contrast to socio-centric and eco-centric motives needed for environmentally responsible behaviour. However, De Young notes that more recent research suggests that self-interest and personal benefits derived from environmentally responsible behaviours can be part of the solution to environmental problems and can work in concert with altruistic motives. According to De Young, it is important to distinguish self-interest from selfishness since the former is often not acknowledged as a constructive and positive motive because it is, mistakenly, equated with the latter (after Perloff 1987). He further argues that "[…] selfishly consuming resources or creating waste without concerns for others is quite different from taking care of yourself […]" in order to be in "[…] a much better position to take care of others who cannot take care of themselves or to advocate for the environment" (p. 515).

In the same vein, Kaplan (2000) sees the altruism-centred approach as "[…] having several inadvertent consequences, including contributing to helplessness and stressing sacrifice rather than quality-of-life-enhancing solutions" (p. 491). Kaplan argues that the altruistic model, closely linked with the 'dour environmentalist stereotype', undermines appeals for environmentally responsible behaviour and may prevent powerful linkages with critiques of materialism as unhealthy and unsatisfying at the level of the individual. The author further writes:

> *At an intuitive level it is not surprising that people resist making changes that they perceive as reducing their quality of life. It is also not surprising that people are concerned about the future of the environment. Perhaps a broader view of human nature, one that encompasses more than material gain, could provide a way out of this impasse. A central failing to the altruistic position is that it attempts to put aside the issue of gain, of self-interest, in human behavior. The 'economic man' position, by contrast, argues that all gain is all that matters. Neither position is satisfactory; there is need for a position that is neither so extreme with respect to the issue of gain nor so narrow in its focus". (p. 496)*

Kaplan proposes that self-interest and altruism should no longer be seen as opposite poles. This present research suggests that, in design, developing solutions that more significantly consider both these motivations, and that are positioned as such, have the potential to support sustainable lifestyles. Essentially, the *self-interest motivators* that have emerged from this research are strongly linked to notions of self-realization and of living a meaningful life; they involve things such as spending more time with family and friends, and are associated with reducing the causes of worry and stress, and alleveating a sense of discontent. These motivators align with Kaplan's 'broader view of human nature' that includes more than material gain, as well as long standing philosophies that recognise human needs as both physical and metaphysical,

individual and social. The next section explores initial and potential implications of recognizing self-interest motives for responsible consumption in the product design field.

5. Some Design Implications

Based on the study conducted, greater acknowledgement of perceived individual benefits for responsible consumption would foster design of longer-lasting, maintainable products. On the one hand, the consumption of long-lasting products could be encouraged on the basis of potential larger personal benefits to the broader public. On the other hand, designers would need to be capable of developing products that are physically and emotionally durable and potentially modular, updatable, easily repairable, and reusable. Clearly, to be economically attractive, new interpretations of business purpose would have to be developed in parallel. Businesses that currently see themselves solely as product providers would need to transform themselves into product/service providers which create economic opportunities through product maintenance and refurbishment, and through building longer terms relationships with the users of their product.

To further encourage increased product life spans, design would potentially have to extend its role to be more involved in maintaining, repairing and reusing activities - as users would be expected to look after their products and to have them maintained and repaired. Designers could be called upon to enlarge their practice fieldwork and act in the context of repair, reuse, and re-design within locally or regionally based facilities (Walker 2006, p. 76). A new area of practice in the domain of product life extension could emerge. Ideally, increased maintenance, repair and re-actualization or update of products, as well as more highly skilled and craft based methods, would provide employment opportunities and, to some extent, minimize the effect of reduced demand for new products on employment and on the economy (Cooper 2005). It is clear that increased product life spans, through better intrinsic durability and/or better care, maintenance and products' re-actualization, seriously challenges many aspects of our current economic system and this, too, will require development and transformation of more sustainable ways of living and working are to advance.

In terms of positioning design solutions that further respond to the self-interest motives of responsible consumption, an important communication and marketing element would be needed to reinforce the personal advantages of these solutions, in addition to the environmental and social benefits. This could potentially allow such solutions to reach people who are not already significantly committed to responsible consumption. These messages could emphasise the benefits of more personal time, less stress and healthier lifestyles, as recognised by the respondents in this study, notably, through the use of product-services or rental services, through a general reduction of consumption in order to be less dependant on work, and via the consumption of products that, by their 'intrinsic' qualities, are more likely to pass over time. Further research would be needed to understand the relationship between self-interest motives and how they can unfold into successful, meaningful messages. Research looking at motives of responsible consumption and its implications for the design and development of products would also be necessary since there is little data on this specific issue. The present research represents an initial contribution to this area, as the main research project to which the presented results belong was not only or specifically focussing on the issue of product design and self-interest for RC.

From the information gathered during this study, DIY activities appear as a noticeable practice among respondents. This has been expressed through the creation and/or redevelopment of objects and through practices such as cooking - to ensure the quality of the ingredients being used, amongst other things. This seems to be in line with an important trend in the recent years in which users initiate and are directly involved in design activities. An example

of changing realities where users are taking a greater part in the design process is the development of open-source software (ex. Linux, OpenOffice, Firefox) via the Web. Another example of this search for greater autonomy on the part of users may be found in the ecologically oriented *ReadyMade* magazine where readers can find recipes for making and remaking things, often re-using materials. It is uncertain whether such 'design-it-yourself' and/or 'do-it-yourself' approaches are more ecological. However, the desire to gain a greater sense of self-empowerment among some citizens is surely positive from a sustainable perspective. Such initiatives remind us that designers could also act as facilitators for users who wish to engage in design activities by providing suggestions and projects, and serving as a resource.

The interviews have also revealed a link between self-interest motives for responsible consumption and a preference for products offering a limited range of options, which are perceived as longer lasting. Such qualities give respondents the feeling that they have greater control over their products and that they can repair them if broken, or at least understand what is wrong. As with aesthetic qualities, it seems increasingly important for designers to be aware of and to understand these perceptions and ideas in order to design products that are adapted to the expectations of responsible consumers.

The study also reveals that participants are disposed to switch from products to product/service systems because, in cases such as car sharing, the product/service system allows them to benefit from the utility of the product when they need it while investing less energy, money and time in caring for, being worried about, and maintaining the product. Therefore, design would further need to be able to propose not only *product focussed* outcomes, but also imaginative *solution focussed* outcomes where the same benefit is achieved in a more sustainable way.

To develop appropriate, alternative design solutions that encompass individual benefits related to responsible consumption, an inclusive, 'interactive' and dynamic relation between users, enterprises and designers will be essential. Scenario building methods (Manzini and Jégou 2000), through which design solutions for the present are derived from desirable futures (i.e. backcasting) that are imagined conjointly with users, is a good example of a methodology that can be used for research and development (R&D) purposes.

6. Conclusions

The conference *Changing the Change* seeks to make a significant contribution to a necessary transformation that involves altering the direction of current changes toward the project of a sustainable future. In this regard, this research suggests that design can contribute to this endeavour by proposing sustainable solutions which, by their very nature and by the way they are presented to the broader public, gives greater consideration to self-interest motives for responsible consumption. We argue that individual benefits resulting from the adoption of sustainable lifestyles should be more directly recognized in the development of more responsible and sustainable products and product/service solutions, and that these factors can take a much greater role in the marketing and positioning of such solutions to the public. Interdisciplinary research in this direction should be conducted in order to further explore the potential and viability of such a proposal.

Here, results have been presented of a study that looked at the motivations related to the perceived gains in quality of life among individuals who already act as responsible consumers. The study revealed how these motivators are expressed through preferences for product qualities. Among the participants at least, the seeking of more time, less stress and a healthier lifestyle are associated with a preference for design solutions that require less care in their maintenance phase and a reduced need for replacement. Information gathered during the fieldwork has been

used to identify initial design responses in relation with the findings. In terms of design methodologies, integration of contributions by responsible consumers in the design process has been proposed as an appropriate method for better understanding the role of objects in their lives and for developing alternative outcomes. With regards to product qualities, the possibility of creating products and structures that allow products to be upgraded, re-designed and re-presented has been suggested. Finally, the results indicate that there is a need to recognise altruistic *and* self-interest motives in the sustainability discourse within design circles, in order to broaden the debate about sustainable design solutions that are capable of connecting with people.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

DAC_Link

A 2.0 tool for SMEs' design innovation

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Abstract

This paper describes a specific tool (DAC_Link) aimed to create a permanent meeting place to exchange knowledge and generate innovative projects by using ICT, supported by both University and Entrepreneurial Associations as trust generators (Fukuyama 1996).

DAC_Link represents the systematization of a two-year experience and concrete experimentations (DAC and DAC_Tool) based upon the action-research framework and the mechanism of the design knowledge and technology transfer (Tasch A.F. 1995) through the physical transfer of innovation agents (newly graduate designers) into companies.

DAC_Link aims to create an open source creative arena for designers and companies, low cost and low impact, a place to generate collective intelligence (Lévy 1996), changing the relation between young designers and Italian SME's.

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1. Introduction

Since the Eighties, the modern economy hasn't followed a standard model, on the contrary it has been organized in several different national capitalisms, each having different stories, cultures, behaviors and institutions (Bonomi, 2005).

The fast and fluid changing market place in a competitive global context (Bauman, 2002), the increasingly aggressive competition (due to the reduction of production costs and not only) and the high variability in the usage and mixing of products and services imposes to companies, especially SMEs and Craftsman Firms, the development of new abilities, in order to generate visions and interpret the signs of these changes.

In this context the industrial structure in Italy looks highly fragmented: it shows originality in the path and in the strongly characterized competitiveness. This has lead to the development of an articulated system of small companies and local systems, generally within traditional sectors that comprise the so-called "made in Italy".

The products that are worldwide known as design masterpieces belong to those sectors; they fill the main specialized magazines, win awards and are exhibited in the most important museums. We are referring to products of the traditional manufacturing sectors that Fortis M. and Quadrio Curzio A. synthetically defined as *made in Italy,* meaning those sectors producing personal goods (Fashion, Apparel) and house goods (Furniture), as well as mechanics and last but not least food. They all fall under the following definition: "*all the excellent products of the Italian production system in their whole: not just fashion, which is one of the most famous examples, but also the other manufacturing products for which Italy has become, after the Second World War, international leader…thanks to design, innovation and quality of the products…"*

Many systems, with different degrees of complexity, to share the work among several small and mainly B2B companies were developed in these kinds of sector, protected by lower technological and financial barriers than others. Those companies are supported by local networks (industrial districts) or by supply and sub-supply chains (production lines) (Becattini 2000), which cross several places, nowadays even non-contiguous ones (meta districts)[3].

The network production of the Italian meta-districts, districts and production lines is able to offer, at a low cost, a wide variety – niches, a prompt variability – adjustment speed and a strong capability of managing unplanned situations which might occur throughout the process – on demand production, and flexibility in answering the customers needs (Bonomi and Rullani 2005).

The main issue regarding this system is that there is no detailed analysis of opportunities, risks, market trends aimed to develop new products consciously and efficiently: innovation still follows a Darwinian architecture, where the market is the final filter and the input to trigger new ideas (Legrenzi 2005). On top of this, there is a deeply rooted mistrust toward ICT, both for internal issues tied to the managerial and organizational adjustment, and for the tendency of the companies to protect their own established "physical" distributional network ("Questione dimensionale", Traù 1999).

It has already been proved that, in the future, companies won't be able to innovate only by means of a strictly technological investment. From this perspective, where companies move toward strategic requirements, design is becoming essential as a value of the product-system. In its latest definition (even if not yet univocally established) the design discipline has definitely evolved from the status of "applied-art" or "artistic-creative" discipline, thanks to its multi-

[3] In 2001 Regione Lombardia was the first Institution to introduce the idea of Metadistrict: a thematic intervention area of a horizontal nature, non geographically restricted and pushed toward a strong inter-sectorial integration, characterized by applying the knowledge gathered.

disciplinary (or multiversa) (Bertola and Manzini, 2004) core, acquiring dignity, as well as at the economic and managerial level (Fortis 2005, Bettiol Micelli 2005, Rullani 2004…)., as a possible or even unique way to innovate the system of Italian SMEs.

There should be a dialogue and a link among the industrial production centers and centers for knowledge and thoughts management (universities and research centers), and there should be a contamination among traditional jobs and new contemporary visions, visions that can be brought to the company by young creative designers.

The emerging need is to create fields in which designers can establish more intense knowledge-sharing relations, in order to trigger initiatives for knowledge investigation and enrichment, originating from the professional practice within the specific district context.

An innovation process, the heterogeneous nature of which implies the connection with globally wide experts networks and with the scientific (research centers, universities…) and technological (R&D labs) research networks, is required to be triggered; in fact the designers' creativity has to be integrated and developed through the comparison with different cognitive fields and skills which can give stimuli, ideas, original point of views to be transformed into product innovation.

The design and unaware SMEs world are apparently different from one another, each comprising a wide set of values, knowledge systems, skills, abilities. However, they both need to meet in order to shape sustainable development plans for the national economy. In this framework the design research system, in a country such as Italy where structured actions in the design field are not foreseen, is the one and only possible bonding agent which can link all these distant worlds. It is the tool that can make the design innovation capabilities clear to the business, institutions, bureaus world, and to the design world the field in which the global competition takes place.

Facing the changes of the design discipline, also the university research has changed, non taking the shape of a closed academic model, but of a system that proactively aims to get universities and the SMEs world close to one another, suggesting ideas, projects, services.

There is a strong need for a design culture by the companies with a production know-how, but very far away from the current market trends and from the necessary vision to realize products that meet the taste of increasingly demanding customers, which don't look for products but for "experience" (Pine and Gilmore 2000) and "emotions"(Norman 2004).

Thus, there is the need for triggering a design-driven innovation model (Verganti 2006), based upon radical innovation, while trying to re-trigger innovative processes which led to the Italian design historical successes of micro-companies which currently are real brands (Artemide, Alessi,…)

However, in these terms, the work to leverage design and to re-launch the Made in Italy should mainly proceed along two parallel routes: one aiming to strengthen the presence of designers in the luxury market (Celaschi 2003), collaborating with the main companies, the other one aiming to shape a basic culture about design in less structured SMEs, in order for them to make the dimensional change, to relate with design and produce design.

2. The design research for SMEs. The DAC case, Design for Arts&Crafts

With a series of pioneering research and further on action-research projects, the Dipartimento INDACO, the Facoltà del Design and the Consorzio POLI.design of Politecnico di Milano, together with the other Italian Universities relating to the SDI | Sistema Design Italia network, started a research path and a series of actions which led to test, at a national level and in some districts, innovative collaboration and knowledge transfer models between official design

system and companies. The most recent experience is represented by the DAC project: Design for Arts&Crafts.

Its main objective, which has become real with the DAC | Tool project, was the creation and testing of a *replicable model* aiming to spread the design culture as a distinctive element for SMEs and Italian handicraft businesses.

Based upon the action-research framework, DAC uses the mechanism of the design knowledge and technology transfer (Tasch A.F. 1995) through the physical transfer of innovation agents (newly graduate designers) into companies. With the researchers' support, this mechanism leads to develop product, service and communication projects together with the companies themselves. This model is so called human capital growth (Romer 1989) and adds expertise to the company, in an action-based perspective. The project was developed through a practical process of learning by doing and learning by interacting, through which the companies (previously unfamiliar with design) had the chance to understand and apply the design innovation potentials, while young designers experienced real working situations, deepening technical knowledge on products and production processes (Arquilla 2006).

In its two editions the project resulted in the development of 38 specific projects for and with 34 Lombardy companies at all levels of the production line, in collaboration with 38 young designers, newly graduates from Politecnico di Milano, for a testing period of over 36 months. During the development time of each business project, there has been a *continuous knowledge exchange*, a mutual growth between the designer and the company and a fruitful communication about the respective methods.

The final results show that designers have given to the companies stimuli and suggestions coming from the global contexts, especially regarding the market trends, the new habits and the users lifestyles, according to their systemic vision, bringing to the company some elements of a renewed design culture. On the other end the entrepreneurs gave their contribution in concretizing the design activity, steering the choices in relation to the abilities and typical competencies of the product culture. The dialogue between the design culture and the product culture generated a positive cognitive circuit, which allowed, in each instance, the projects to be realized, going over the objectives set by both companies and designers. Furthermore, the relations established with the companies went beyond the project duration, often generating new businesses founded by the participant young designers, on the basis of the experience.

3. The DAC_Link project

DAC_Link, the project presented in this paper, is based upon the results gained by the DACs: it aims to bring the previous experimental experiences at a level that allows Designers and Companies to have continuity and self-generation in the design and innovative impulse.

While the ICT saw its success, the knowledge coding, transmission and acquisition costs have been largely reduced; as a consequence, knowledge has become a more replicable and mobile resource, increasingly independent from space and time (Rullani 2004). These evolutions support virtual remote cooperation contexts. The new forms of cognitive work division take the shape of virtual communities, social learning platforms which find in the network technologies the main support to their activities (Micelli 2000).

Thus, if designers and SMEs found their success upon the network organization in which they operate, it is evident how the Web can become an extremely functional supporting tool; from online trend analysis, it has emerged that social networking, a community format allowing to get quickly in touch with whoever shares the same needs or interests, is currently the ideal expedient to boost direct and transversal collaboration and generate the sense of belonging to a productive community which pursues innovation.

Yet, if creative professionals are surely ready to put their profession at stake on the web, as the success of sites such as Coroflot of Core77, (www.coroflot.com), LinkedIn (www.linkedin.com) and the Italian Qoob (www.qoob.tv) shows, we can't assert the same for companies, still far away from the online sharing logics. The aim of the project is to gradually reach a communicative symmetry allowing both actors to extend their line, and consequently their competitive and innovative potential while articulating the community, which can maintain a balance between company and creative world, while identifying uses and benefits for both of them.

This kind of intervention needs to be supported by a design project that can satisfy the need of its main interlocutors to participate and cooperate through the use of a communicative and functional language and interaction modalities: a design solution that we believe deserves to be discussed and investigated in this paper.

The DAC and DAC_Tool projects represented, at the Lombardy region level, the concretization of that professional network thanks to which the University communicates with young professional from one side and SMEs from the other, while the associations are the intermediaries.

DAC_Link aims to widen this network to a national, maybe global, level, through the use of ICT mediated by a design-oriented approach in a soft and mediate social networking way.

DAC_Link aims to create a permanent meeting place for knowledge exchange and to generate innovative projects, while changing the relation between young designers and SMEs unfamiliar with design. The tool aims to define a virtually shared arena, a place to generate collective intelligence (Lévy 1996), supported by both University and Entrepreneurial Associations as trust generators (Fukuyama 1996).

In this perspective, DAC_Link is a design project thought to promote design at a systemic level: if design could get certain kinds of users close to new technologies, it could be possible to trigger the same dynamic to get users unfamiliar with design close to design itself.

4. Methodology

Since the very beginning, the design approach had to face the need of an innovative proposal to live together with the pursuit for simple solutions, in order to attract from one side actors coming from a creative and extremely productive and open design world (young designers), from the other companies, as stated above, culturally wary of the use of new technologies and of knowledge sharing.

As already mentioned, the project is based on the Internet technology: the preliminary analysis was then aimed to investigate first of all the main aspects of the evolution of the Network intended as Web 2.0, then to verify where those characteristics were successfully applied in relevant case histories.

The main aspect that characterizes the Web in its current evolution is the collaborative and participatory use of tools and network services with high added value in terms of user experience. Some obvious examples are blogs (on line diaries), Wikipedia ("the free encyclopedia that anyone can edit"), Skype (the peer-to-peer phone service), OpenOffice (the co-developed and open-source platform for document processing), Flickr (where contents are shared), and the customization and immediacy of Feed RSS.

Nowadays we talk about Social Read/Write Web (srww), in which each user is editor, user, distributor and collaborator at the same time. Internet is more and more considered as a platform supplying services while leveraging on collective intelligence, able to guarantee shared information and OnDemand contents. Its value is generated and measured by the users themselves, reaching the extreme example of the UGC (user Generated Content); other decisive concepts in srww are Perpetual Beta: continuously evolving products/services always subject to collective tests, and LongTail as the base for stable business models.

Thus, Internet becomes more and more the tool to create and strengthen relations among people. The quality of the users' experience in using new srww services is a crucial factor in determining how successful is a web service: users look for the environment (and markets) in which conversations and relations with other users are exalted.

The online social networking definitely belongs in this field: it is based among the 6 degrees of separation concept, which the sociologist Stanley Milgram introduced in 1967: it refers to the idea that everyone is an average of six "steps" away from any person on Earth.

This finds application in virtual spaces which start by linking to one another people that already know each other; connections with friends and acquaintances then allow to establish relations with unknown people, friends of friends, exponentially widening the personal virtual network, as well as the real one, potentially –and ideally– comprising the whole world population. The users aggregation can develop around specific contents and subjects, or simply aim to develop friendly relationships, meet new people or establish professional relations.

In this instance, the interaction among professionals from different geographic areas and production fields is developed to establish relations which often become real business opportunities: for this reason, it is of extreme importance to be able to leverage the resources of a virtual community, as it represents a starting point to establish possible contacts within specific sectors or tied to complementary competencies. The social network then represents the main modality through which the concept of unlimited interaction and knowledge sharing at the basis of the Web evolution ambitions is developed.

On another side of the investigation, an in-depth analysis was carried out on successful case histories with similar objectives. The examined and analyzed sites are national and international, mainly institutional: from the research and innovation centers web sites (e.g. Politecnico Innovazione, MIP, Flanders DC), to the main international design centers (e.g. Design Council, BCD, DDI, CIDEM, Bai Bizkaia, CDRA, Design Vlaanderen, CPD, NORSK DESIGN).

These have been mapped in a graph that highlighted the relation between the communicative impact and the value of the service, trying to verify at the same time if, while playing the role of a "hinge", they'd be more targeted towards designers or companies, and using what language.

The sites were then evaluated identifying parameters (update; communication; information; tools; accessibility) which would take into consideration the contents, with special attention to the supplied services, for which a frequency index was defined. This index, appropriately adjusted to the Italian situation, led to the definition of the new offer (Fig. 2).

The result of the research highlighted that most of these sites, which share the aim to promote the design discipline as a crucial resource in the business field, prefer to communicate information through institutional texts (report, education, persuasion) rather than through the use of interactive areas which could transform the site itself into an intervention – not just support – tool. In the event of this last possibility being foreseen by the organization, it is assigned to an external site, a real project in itself.

A clear limit of these systems is that the actors are catalogued (database and directory) based on a typical system of databases (filtered lists of addresses/contacts). It was thus decided that the contact between companies and designers should be pursued with a much less technical approach, in favor of a more semantic and visual one, aimed to gain the interest of companies seeking for immediate feedback and to illustrate the benefits that design can bring in the long run.

The possibility to share computer-based resources, i.e. non mediated by a specific employed, cuts costs and time but, especially in regard to the Italian business situation, is not enough to go beyond the still existing limits in accessing the technologies.

This is where the idea of a further step generates from: using the social networking, counting on the easy participation, contents relevance, spontaneous generation of dialogue, continuity in the relation, intuitive information gathering and more effective tools to build and cultivate one's personal reputation on line, which will then reflect on the real world.

5. System's architecture

DAC_Link is based on a system which starts from the hypothetic online participation of all the actors in the innovation network: the creative class, comprising of professionals, newly graduates and creative companies, and the national districts companies will be involved in the site, in a regulated process, coordinated by the University and facilitated by trade associations, through physical and virtual windows. The aim is to generate a community, which establishes collaborative long-term relations, widening the network of relations and competencies thanks to the site's presence and activity.

Getting closer to the specific dynamics of the project, the home page plays a crucial role in catalyzing and publishing the activities of the community, and becomes the hub around which the whole service revolves. The home page should lead to a continuous access to the site, thanks to its visual appeal but most of all to the reliability of the contents: according to the philosophy of Web 2.0 it has to guarantee the constant update and the sources' trustworthiness. The DAC_Link home page was designed to respond to these needs, acting as a "shared board", the contents of which (mainly public bans, news and press releases) are published by the member of the community themselves.

The core of the site in terms of complexity of the information lies in the two sections dedicated to the Companies and Designers respectively. These two areas are extremely similar as they have advanced tools to search for competencies within the database of the community and they also have a selection of the users in the given category according to the latest update they made.

There is a "Services" area in which the technical and knowledge resources that the University puts at the companies disposal are communicated, and a "Best Practices" area which is named after DAC_Lab; in this area the design projects which were developed thanks to the online interaction –on the site– will be published. At last, a "Download" area will allow to view informative design material.

Other informative and institutional sections have been set up (information on promoters, press area, F.A.Q. etc..); they visually differ in the navigation menu, which hierarchies the site's contents to communicate where the core of the initiative is, meaning where it differs from a common window-site.

This is how the system works: from the home page, companies and designer can get a free subscription, and manage their personal profile including images and information about their activity. All contents are selected and published by the users, upon validation by the site's Admin.

The advantage represented by owning a personal space as part of the community lies in the possibility of building direct relationships among the different profiles, encouraged by the sites' architecture, which gives visibility and reputation to those who show themselves as the most active within the community, using the tools that it puts at their disposal.

Furthermore, the fact of being in the same space, a space which has a high reputation as it is managed by actors that already have a high reputation in the physical world, represent to the participants a further positive element in comparison with other realities outside the community: to subscribe to the service means to believe in the same design and business values interpreted by actuators and promoters, making the shift from simple "company/studio/professional with an internet site" to "active protagonist of the creative and business Italian community".

More in detail, subscribed Companies and Designers:

- manage a public personal profile with a gallery of selected images;
- can visualize entire profiles, including personal data (i.e. contacts);
- can publish news and update regarding their own activity;

- can participate and interact with the site through aggregation solution (e.g. blog/agenda, feed rss);
- can activate a working platform to develop projects with other people subscribed. The projects will become candidates for being published on DAC_Lab.

There is a third participation modality, especially dedicated to research institutions and trade association willing to participate in the initiative: this typology, defined as “Partner”, put at the subscriber disposal a description page and the possibility of publishing bans and information regarding funding – which also become visible on the home page.

Finally, those users which aren’t involved in any of the above mentioned categories (Companies, Designers and Associations), but which want to get updates on the activities published on the site, can subscribe to information and participatory services such as newsletters, free RSS and forums.

At this point it is easy to guess the importance of the backoffice, meaning the management panel which allows the subscribers to upload their content: usability and simplicity are factors that couldn’t be left out of consideration. This personal area also allows to develop design projects online, throughout all the design steps.

A very intuitive navigation system was designed, which defines 5 macro-areas of primary importance, and another 6 areas with the same depth but with “archive”, information “collector” functions.

The site architecture is designed so that the relationships that the community users can build are heterogeneous: not only among just companies or just designers, but the relations can and should transversally interlace among creative professionals, entrepreneurs and associations. For this very reason, the decision was made of considering the several areas not as monads not communicating with each other, but to always highlight the connections among areas.

A key role in the success of the system was played by the technological aspect: the level of innovation is not measured on the technical complexity of the available functions, but on the level of response to the requirements of the actors involved in the community: the technology shouldn’t represent the final goal, but be the “invisible” tool for the communication among the actors. The service was built using some of the best practices of the tools used by the Web 2.0. Furthermore, the Active Collab platform, an open-source tool for cooperative development of projects in the private area, was integrated in the system.

6. Visual interface

The graphics of the interface was designed thinking of an extremely heterogeneous target: in fact from one side an innovation project aimed at the creative class has to show a strong graphic character which is visually appealing. From the other side though, it was necessary to mediate the contents and information complexity of the service opting for aesthetic choices which represent both clear and simple solutions without becoming too conceptually synthetic, but privileging an explicit communication which uses pictograms, colors and well known metaphores.

Each affiliation modalities is represented by its own pictogram and color, which symbolizes the contents related to either companies, designer or partners/services.

If we examine the home page (Fig.3), it is possible to see that the main navigation menu (A) was designed to communicate clearly the contents hierarchy: the links to the DAC_link main services are in the biggest box, while the links to the descriptive static areas are in the smallest box, placed under the other one. Many web sites use a horizontal menu on the top and a vertical menu on the site to express this semantic difference: in this instance, the main area needed to be entirely dedicated to the visualization of the profiles, thus the idea of placing the whole navigation bar on the left hand side, which results in a sort of intuitive and always available site map.

The subscription form and the access to the control panel (B) are found in all pages, as well as a dynamic header, which presents some excellent case histories of collaborations established through the site (C).

As regards the contents of the main area, there are 3 levels of information in the home page. A short animation, which presents the community's actors, the advantages and the vision of the service, occupies the upper part (D); this area has a mainly illustrative function: it has to describe the service and encourage the subscription. The central part (E) shows the updates of the community and thus of the contents: especially the news that companies and designers publish, together with an image and a brief description, and the bans and funding opportunities published by partners and site's administrators.

Finally it is possible to see the updates in the single personal profiles in the column at the far left (F), at the bottom of which there is a mini-menu which allows to access to the participatory services dedicated to the site's subscribers. These contents show the dynamicity of the site according to the web 2.0 philosophy, even if they are visualized at a secondary level: news and financing calls represent the core activity of the system and the main motivation for users to subscribe.

The Companies and Designers areas look alike: the features and the actions allowed to the two kinds of subscribers are the same.

In the first area (G) the advantages of the subscription are described: below (H) there is a list of subscribers in the given category, presented according to the latest update and completed by a preview of the subscribers' avatar. Finally, in the lower area (I), a high importance – and space – is given to the form for the advanced search, which allows users to search in the database through multiple keys such as the name, geographic area, field and specific competencies of the subscriber. These last two parameters represent the most relevant functionality: they vary when searching for a company or a designer, and are selected by a basic taxonomy, which can be integrated with new fields even by the users of the community; this shows once again that the system is open, and in a perpetual beta version. The companies can be searched by typology and position in the production chain, defining the competencies in terms of manufacturing process and machinery. The designers are organized according to the design fields officially acknowledged in Italy (product, communication, fashion, interior and service) and the technical skills.

It is possible to access the profiles of the single elements of the community in two ways: through a spontaneous and intuitive approach that shows the elements through an update and networking activity, and through a more mediated and schematic approach that leads to the univocal selections of the profile's characteristics.

The same analogy in the interface architecture is used for the look and the layout of the users' public profiles. The aim was to synthesize useful information, avoiding redundancies and excessive complexity; the idea is not to create a web site, but a window that can illustrate the user's "mood", competencies and contacts. More specifically, users can upload an avatar image and organize their photo gallery, write a brief description of their professional profile and a short list of contacts.

In order to guarantee that users can upload these contents in the more usable and intuitive possible way, an online management panel was created. The graphic architecture of the site is kept, to help the user, but the navigation bar for the back office functions substitutes the general menu.

The web panel allows to publish descriptions, work images of products/projects/events (it is possible to determine the order in which the images are viewed and with which layout), news about the activities. Designers and companies can also require to have a dedicated area for remote, where contents and progresses can be shared.

The financing calls represent the last very important objective of the service: associations and research centers can publish, for a wide audience, information regarding calls and funding

opportunities. This represents a crucial tool for the success of the community and to attract external visitors.

The calls can also be searched in the two different ways mentioned above: they can be read through the latest news on the home page, or can be searched through a form, as detailed as that to search companies, designers and associations.

The static pages dedicated to the services and download complete the “features” offered by the site. The first one shows the possibility of collaboration with which the University and the associations aim to support SMEs and designers even in the real world. The second one allows to share specific material about design and innovation.

The advantage for the company to be subscribed should be represented by the possibility of reaching competencies otherwise external to their usual network, with no communication and HR cost, thus starting a low-risk innovation strategy (limited investments).

The designer, on the other hand, has the possibility of developing the gained skills while becoming closer to the production dynamics, learning to manage the relationship with clients and introducing an important element in the resume, on top of having the possibility of self-promoting within a different network than the university one.

It is evident that, considered the heterogeneity of the target users, the relations and interactions run on both a horizontal and a vertical level, and they can significantly increase: among professionals in the same field, among complementary companies, among creative professionals and entrepreneurs, among and with associations and research centers.

At the same time, it is important to highlight the experimental nature of the project, which is still in its kickoff phase: it should not be taken for granted that both designers and companies will perceive the benefit of service in the same way. If, for example, companies would seem to have difficulties in using the service, changes will have to be made in order to get closer to the most receptive target. Even considering these uncertainties, the service was designed according to the “perpetual beta” idea, thus thinking about its contents update and adaptability according to how the users and the actors involved will use it.

7. Conclusion

The DAC_Link project has to be analyzed considering the high variability of the rapidly evolving socio-economic scenario: for these reasons, the site should not be considered as a final solution, despite the success of the initiative.

One of the possible development factors is definitely the technology permeability on one side and the design methodologies within the SMEs on the other. If the project will contribute to the growth of the production system, which is the main trigger for the initiative, a new intervention will then be required, to widen the offer of interaction tools that the subscribers can use, and to intensify the multiplicity and heterogeneity of the contacts within the community.

The service could also evolve widening the innovation model both at a geographical level (from a national to an international scale) and at an organizational level, involving new actors, new competencies and integrating it with a network of “physical” services.

As we have already seen, DAC_Link is created as a specific answer to the current business and professional Italian scenario, trying to give a virtual dimension to those dynamics which historically determined the success of the Made in Italy, and strengthen the relationship between creativity and market in the global scenario. Though, this doesn’t prevent the collaboration model to be used in Countries with similarities to the Italian system.

The “physical” dimension, on the other side, is not replaced or left out, but it remains a crucial element to spontaneously involve more actors and offer an innovation service as integrated and complete as possible.

The project suggests a model: its evolution is strictly tied to the same actors and contexts to whom it is addressed and which tries to train, promote, stimulate.

In conclusion, the DAC_Link challenge is multi-layered:

- filling the gap between Design, SMEs and Hi-Tech Innovation by communicating how a low risk strategy design-based can produce long-term profitable results;
- using Technology itself (Web) to Communicate innovation (supporting knowledge-sharing processes) through new and empirically effective forms of communication (social networking);
- strengthening the relationship between Young Designers, University and SMEs through the Trade Associations' channels;
- offering a service able to interpret the needs of young designers according to the constantly changing professional context, granting them a future after Graduation;
- finally, defining an online format that could best synthesize all these aspects into a usable and, above all, useful device.

DAC_Link shows at last that to fill the gap between SMEs and Technology through Design means to fill the gap between SMEs and Design in a sustainable way; this system aims to change the actual model of generating innovation by supporting new and unusual creative processes.

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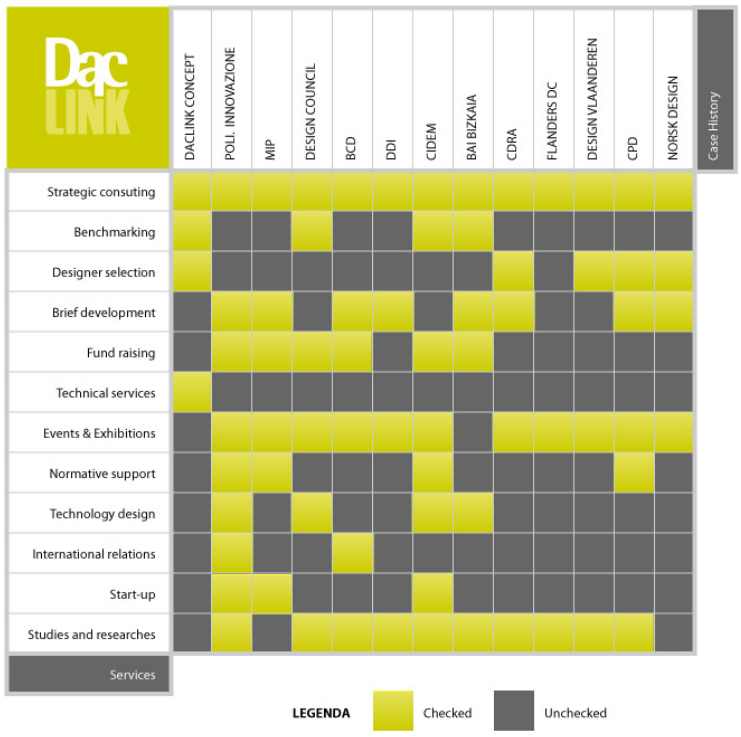
Fig. 1: original DAC model.

The scheme illustrates the process of the first DAC experience, which allowed 38 selected designers to work upon multiform projects based on “house system” aimed to 34 selected small enterprises. The keywords reveal the significant resources produced by the actors involved.



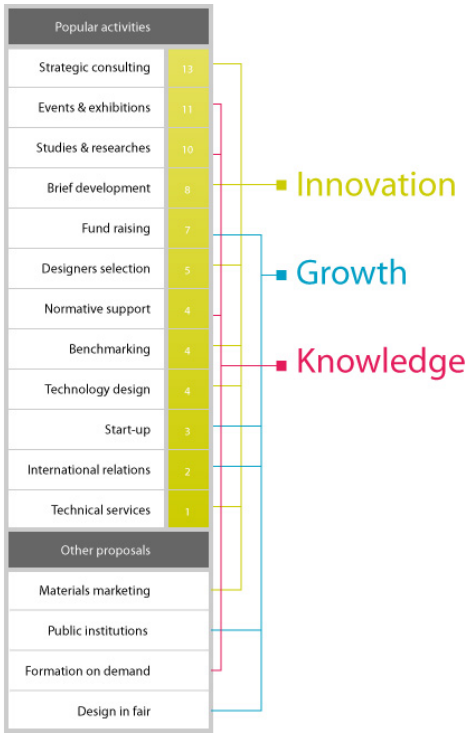


Fig. 2: benchmarking analysis, mapping.

Fig. 3: the DAC_Link project.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Evolving Role of Design:

Opportunities and challenges for the Australian Packaging Industry towards sustainable design.

Areli Avendano[1]

Abstract

While the role of design has been widely acknowledged as a significant contributor to sustainability by some Australian Industries and government associations; yet the Packaging Industry has not fully taken advantage of design as a key strategy to achieve sustainable solutions.

This paper is based on existing literature as well as on key findings resulting from a range of face-to face interviews carried out with experts among the Australian Food and Beverage packaging supply chain.

A summary of opportunities as well as specific challenges for design in the Australian packaging industry towards packaging sustainability is listed.

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1. Introduction

According to a United Nations (UN) report, a key issue to achieve sustainable development is the integration of production and consumption patterns; product designers are identified as an influential link between production and consumption by incorporating sustainable principles into the development of products (UNEP 2004, p.6).

The role of the industrial/product designer has been largely discussed throughout time; however, it has been generally regarded as the activity of translating an idea or concept into a product that satisfies a real need; combining manufacturing, technical, economical, ergonomics and aesthetics aspects to make it perform efficiently (Powell 2004, p.1). Donald Norman (1988, p. 190), in his book *The Design of Everyday Things*, states that an essential responsibility of the designer is to deliver objects based upon real needs of the potential users whether it is as a society or a single individual. Designers form the interface between 'the user' and 'the product'.

On the other hand, as sustainability concerns are becoming increasingly important to business, the role of designers has been inevitably challenged by this concept; environmental, economical and ethical considerations must be included in the new product development process. This is not to say that design typically did not approach such issues, but they frequently are vaguely considered or in a very limited way as the field has been dominated by financial profit (Thorpe 2007, p. 10). Conversely, it would be fair to mention that some companies are genuinely addressing environmental and social issues; they have acknowledged that current production and consumption practices inevitability have to adapt to the new contexts we face. Products will be continually developed but it should be essential to consider whether or not they are making a significant contribution to material culture (Walker 2006, p.33) in order to maintain growth in the term.

For more than 3 decades, products associated to the packaging industry have received substantial attention in the global sustainability debate as they are perceived as principal users of material resources as well as waste generator. Yet, the most significant environmental impacts resulting from packaging are lock-in at early stages of the development and manufacturing of packaging-products: raw material extraction, energy and water consumption as well as greenhouse gas emissions are critical factors (Lewis & Gertsakis 2001).

The fundamental role of packaging that it performs in our society is often disregarded: content, protect, preserve, inform as well as ensure safety and healthy requirements and, in the case of food packaging it ultimately reduce the spoilage or damage of products along the supply chain (Design Council, 1997). Consequently, to adequately assess a packaging overall environmental performance it is essential to consider its role along the entire supply chain.

Currently, a diverse number of tools, methods, strategies and principles for incorporating sustainable design have been developed: from guidelines and checklists that are concerned in reducing the amount of materials, reducing waste or using recycled materials (all of them with a product focus), to more sophisticated models such as life cycle assessment (LCA). Whilst important levels of improvement have been achieved: such solutions do not necessarily address all three levels related to packaging sustainability (social, economical and environmental). Broader concepts have to be embraced to extend beyond single products and incorporate larger ecological and social aspects, which draw from principles of ecology, biology and a vision of a future sustainable society that supports the design of product and services (Tischner 2006, p. 6).

The Australian packaging industry is still in early stages of addressing environmental impacts of their activities and products; particularly there are concerns about how to address them through changes in manufacturing, design, logistics, marketing and business structures and

relationships (Fitzpatrick et al., 2007 p. 157). On the other hand there seems not to be a general understanding of the meaning of sustainable packaging: different approaches are needed to incorporate environmental issues as well as economical and social ones into the development of packaging. In addition, it is essential that those concepts are integrated early in the development process and it is at that point where designers could potentially address them appropriately.

In respond to those concerns, in 1999 the Australian National Packaging Covenant (NPC) was first introduced as a voluntary agreement between all levels of government (Federal, State and Local) and the packaging supply chain (brand owners, manufacturers, retailers and fillers). The Covenant is based on the principles of shared responsibility through product stewardship, including the effective design and operation of kerbside recycling systems. Some of the key performance indicators are related to the packaging manufactured by a company or specifically to the design, manufacture and distributions processes. Some relevant objectives are (NPC 2005, p. 3):

- To engage the packaging supply chain, consumers, environment groups and policy makers in a debate about sustainable packaging principles, goals and strategies.
- To assist the packaging supply chain and users to make responsible choices, including design, purchasing, recycling, reuse and disposal.
- To reach consensus within key stakeholder groups about the need to integrate sustainability objectives in the design and management of packaging systems along the supply chain.

2. Aims

The NPC proposes as a strategy to address environmental issues the use of an improved product design process which considers carefully decisions made regarding material's selection, material's efficiency and manufacturing processes, as well as end-of-life management during the development of the packaging. It is widely recognised that it is important to include this type of decision making early in the product development when packaging designers in coordination with other professionals (marketers, environmental managers, supply chain managers, manufactures, retailers, etc) have the greatest opportunity to address environmental pressures and as a result develop effective sustainable packaging systems.

However, the NPC does not provide clear leadership on how product design could improve the environmental performance of packaging while effectively meet essential functional and business requirements. Furthermore, it is not only through better design and development processes that the issues should be addressed; pursuing sustainability requires to consider the trade-offs and requirements of all stakeholders along the packaging supply chain. It is also necessary to incorporate consumer perspectives into the process to deliver more holistic solutions.

However, the question remains in the air: how can design promote the development of sustainable packaging. In order to understand the current status and perception of the role of design in the Australian Packaging Industry and be able to identify the opportunities and challenges towards sustainable packaging design, the research aims are the following:

- to review and assess the roles and responsibilities of key stakeholders throughout the supply chain (e.g. packaging technologists, environmental manager, designers, marketers) to identify gaps and limitations in the decision-making processes for designing packaging.

- to identify of opportunities, trade-offs and challenges for Australia towards sustainable packaging design.

3. Australian Packaging Industry Overview

The context of the study presented in this paper is within the Food and Beverage Packaging Industry as it is currently the largest sector in the packaging industry accounting for around 65-70% of the total amount of packaging produced in Australia (PCA 2001).

Currently, there is an emergent demand for businesses to offer more environmentally responsible choices in their products as well as their packaging. Therefore, sustainability has become a great concern to the Australian Packaging Industry; whether it is a genuine concern or as a part of a global trend, but some commitments have been made to improve the packaging supply chain. Such integration of economics, environmental and social performance into the development process of products is recognised as a strategic business challenge for upcoming future (James et al. 2005, p.117).

However, assessing the sustainability of packaging is not an easy task, as mentioned before, mainly because the packaging itself is part of the product and the most significant environmental impacts are related to the production of the actual product and the packaging accounts for a minimal percentage of the overall impact. A great emphasis has been put in packaging waste and recycling issues and these have diverted the efforts to address major issues towards packaging sustainable, such as climate change and green house emissions as well as natural resources depletion. This is in part as a result of the NPC has significantly focused on packaging recycling targets. However, this has started to become an issue and some pressures have been put against the approach taken as recycling might not be the more sustainable approach for some packaging solutions. For instance, light weighting and down gauging might be a more appropriate strategy. In addition, some other criteria has been pushed to be part of the sustainability assessment more relevant to the Australian context such as: water consumption and energy intensity in packaging manufacturing and recovery.

Current patterns of production and consumption cannot be continued in a world of growing population, rising human aspirations, and limited carrying capacity. In addition, companies will increasingly be urged to implement producer responsibility and corporate social responsibility throughout the whole life-cycle by laws and regulations.

3.1 Industry drivers for sustainability

According to the NPC (2005, p.3) some drivers for sustainability are:

- Policy developments in the management and disposal of used consumer packaging and paper occurred, both domestically and internationally.
- The expansion and maintenance of kerbside recycling services by Australian local governments to over 90% of the Australian population and substantial efforts to improve their yield and cost effectiveness.
- Community awareness and concern about environmental issues, including packaging, remains high. There continues to be considerable community support for kerbside recycling services which results in an increased supply of recyclable materials.
- Recognition on the part of all governments and industry that there is a need for a nationally consistent approach to the lifecycle management of consumer packaging and paper including its recovery, re-utilisation and disposal.
- Changes in consumer demand and demographics are affecting the way products are packaged.
- Changes in packaging design and technology that are providing a wider range of

packaging options as well as reducing material usage at source.

- Increasing exposure to international competition for Australian business.
- A growing global trade in recyclables as commodities.

However, to create change it is important to note that all parts of the packaging supply chain have to make their contribution by committing to consider the whole lifecycle of a packaging-product from raw material extraction to end-of-life management.

4. Methodology

The fundings presented in this paper are a combination of literature already existing and a series of interviews among stakeholders in the Australian Food and Beverage packaging industry.

The proposed methodology for this project is Grounded theory, as it is a qualitative research analysis technique whereby theory is generated from the collected data (Glaser&Strauss 1978). Inductive processes are used to collect and analyse the data; and theories, concepts, hypotheses and propositions are developed from the collected data and not from prior theories, assumptions or other research.

All the interviews, with the exception of 2, were audio-taped (interviewees gave written permission for it) to facilitate the transcription and analysis of them. The interview time varied from 25 min to 1hr 10 min; depending on the level of engagement of the interviewee (particularly interviews with designers and marketers took the longest time). The transcription of the interviews (word-by-word) has been carried out by the author, which facilitate the analysis process. Participant's name and their organisations has been removed from the transcriptions and was replaced by a code that only the researcher is able to identify.The data analysis process consists of three activities: data reduction, data display and conclusion drawing and verification.

While the transcription process is still in progress and its expected conclusion is by July 2008. Once the data is reduced to the categories, themes and patterns, the data will be displayed in matrices, graphs and network diagrams. However, for the purposes of this paper, some data has being reduced by a process of selection, simplification, abstraction and transformation to enable categories, themes and patterns to be identified. Data organised and compressed in such displays has provide an opportunity for emergent hypotheses to be tested against the literature data. Following the data display, propositions will be developed emphasasing relevant aspects for design.

Iniatially a list of 40 potential participants was proposed: official invitations to participate were sent via e-mail / telephone conversation: the responses periods varied from 1 day to 1 month which made the process considerably complex, taking over a year to finalise with all interviews. From those initial 40, a positive response was obtained from 27; as a result a second list of 15 people was prepared to have a more significant sample. A total of 37 interviews were carried out. The participant companies ranged from brand owners, consultancies and design studios to packaging manufacturers, retailers and govermnet agencies; from which 11 designers, 8 marketers, 7 packaging technologists, 5 packaging experts, 3 environmental managers, 2 retailers and 1 policy maker were interviewed. The diversity of companies provided a broad perspective of the current status of the Australian Packaging Industry.

The interviews involved a semi-structured questionnaire with 12 questions divided in 3 sections:

- Packaging Industry Issues

- Packaging Developing process
- Packaging Sustainability

Key questions relevant to design have been selected and presented in the following section.

5. Preliminary Results

The focus of this section is to describe some preliminary results of selected questions from the series of interviews where the following points were discussed:

- Identifying people involved in the packaging development process and decisions made by them.
- Description of the interactions between those involved in the process as well as additional types of interactions derived from considering sustainability in the process.
- People involved in the incorporation of sustainability principles in packaging.
- Discussion regarding barriers for the development of more sustainable packaging.
- Perceptions on potential contributors to the sustainability of the product.
- Opportunities for a more efficient implementation of sustainable packaging design.

5.1 Current role of packaging in society

- Packaging has a fundamental role in our modern society: in the particular case of food and beverage packaging, preserving the quality and the freshness of products is fundamental (Robertson 2006, 3) as shown in **Figure** 1 .

Figure 1 : The fundamental role of packaging. (Photo: Areli Avendano)

The Packaging Council of Australia (2001) has defined packaging to encompass the following functions:

- Must contain the product.
- Must preserve and protect its contents.
- Safely deliver products to consumer

A communication device providing details about the product, including price, contents, ingredients and nutritional value as well as cooking instructions and recommended use by dates.

In the first section of the interview (Packaging Industry Issues), participants were asked: "*What makes a successful packaging from their role's perspective?"*

The answers varied from those that did mentioned most of the above functions (mostly packaging technologists) to those others that emphasised the aesthetics, performance and cost (mostly designers and some packaging technologists).

"Successful packaging is one that does the job and offers consumers benefits".

"It the one that performs its job in the most cost-effective way and the customers wants to have it."

"It varies from customer to customer, but in general for the food industry it needs to perform its function such as barrier to extend its shelf life and withstand filling processes such as temperatures and finally transportation…"

Some others focused in the branding part of the packaging; it was highly regarded as an essential medium for communicating the brand values to consumers as well as a product differentiation means (marketers):

> "It is fundamental, as it allows products to be transported and make them available to consumers…even though we try to reduce the use of packaging we know that is the most marketable type of pack the packaging that is going to sell the most".
>
> "It has to stand out on shelf the way we use the designs, it's one of the most important things…"

Environmental managers as well as some designers mentioned that minimising the environmental impact of packaging was a pursued objective. Some mentioned that addressing sustainability issues has been incorporated in their mission statement. However, it is not the priority and probably in most cases is not even in the top 3 requirements that made a successful packaging:

"Even if the CEO is aware of the environmental impacts of our packaging, the message does not necessarily goes down to the marketing area that it is a bit hazy about it… a lot of the marketing innovation is not driven in those lines."

"Packaging that has the best selection of materials within the constraints of cost, the constraints of our factories… and also within the constraints of the marketers. Unfortunately at this point, the environmental aspects are not a deciding factor."

This is particularly worth noting as it is a reference to understand better the factors taken into account and gives a background on the decisions made when developing a new packaging. It also demonstrates that the role of packaging has significantly moved far from only content and protect the product to be an almost essential branding tool.

5.2 Packaging design and developing process

The mainstream design process consists of a non-linear series of different phases for the development of a product (i.e. it is an iterative process). The process engages meeting marketing, manufacturing and financial requirements as well as environmental and government regulations. In practice, companies use a combination of approaches and tools to design and develop their products. In industry, the product design and development process most of the times is a formalised approach with fixed milestones and gateway management, whereas in small companies one or several people, working in an informal and more intuitive manner can carry out product development (Green 2003).

The design process starts with the preparation of a brief. Generally designers work within a written design brief given by the client, or ideally shaped in conjunction with them. The brief summarises what is required for the development of a product, such as functionality, form, usability issues and performance and technical aspects. It also specifies any important constraints as well as environmental regulations and legal terms related to the product.

Environmental regulations include use of natural resources, energy and pollution resulting from the manufacturing process as well as the end-of-life management. It is important to ensure the decisions taken regarding environmental issues satisfy the requirements of the project and have clear deliverables at the end. Once the brief is finished, the next phase is the idea generation commonly presented by sketches or models.

Frequently, the idea generation phase involves several meetings with the client, and eventually an idea is chosen and the concept development starts. The concept is worked in more detail considering all the requirements in a statement in the brief and determination of components and materials and manufacture phase to the marketing of the products, user's interaction (product language) and finally, the end of life management with the product (DIA 1997).

Many important considerations can be addressed from this early phase of the process, such as detailed design, design for reuse, recycling or composting, determination of manufacturing costs and investment as well as sustainable aspects regarding the production of the product. It is at this phase where product design plays an important contribution to promote sustainable practices due to assisting the decision-making process during all stages of the product development. It is also at this point where most of the environmental impact is "locked in" due to specific material and technology choices made in the design. The typical stages of the product design process are illustrated in Figure 2.

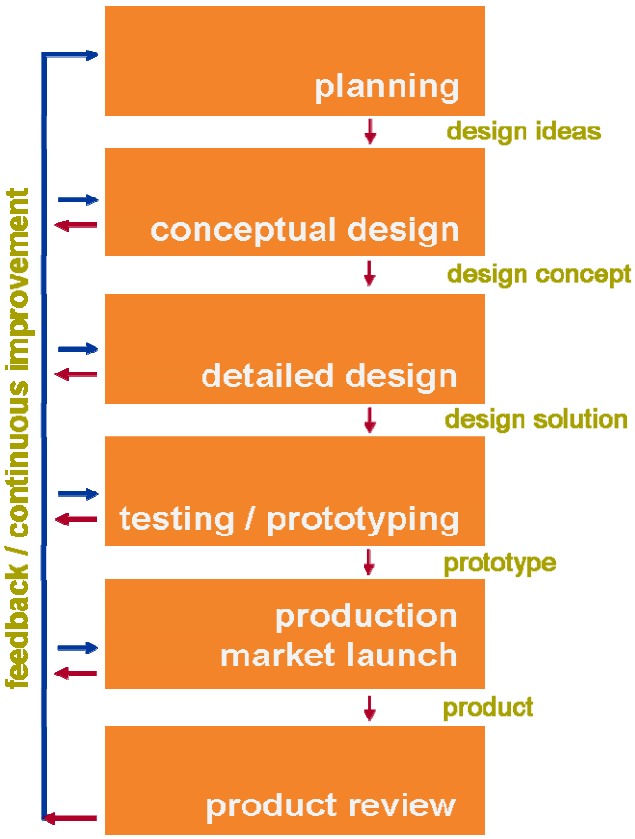

Figure 2 : Pr**oduct design process (source: adapted from ISO 14062-2003)**

In the second section of the interviews (Packaging development process), participants were asked:

"How would you describe the development process of a new packaging system: from initial idea to final product?"

The process varied accordingly to the type of company; for example brand owners have a "formalised" procedure where the initial idea normally starts at the marketing area. Generally that idea is driven by making financial profit, increasing sales or brand plans. Then a brief is written and given to the "design team", whether they are actual designers or packaging technologists.

The norm seemed to be that Marketing had the influence to make decisions such as packaging materials; packaging formats and sizes; and some times even labelling and colours have been already chosen in the brief. This leaves very little flexibility to designers/ packaging technologists to develop some concepts and be more creative. It is a common practice within brand owner companies that the designer/packaging technologist is in charge of the packaging specifications whereas in design studios designers are more focused in the packaging aesthetics.

Then the design team will start to develop concepts or ideas (sketches); 5 to 15 ideas are generated and then the top 3-5 are selected and they will be taken into a proper development process. Those go back to the marketing department or to the customer. For brand owners

companies, generally these decisions are made in meetings where the “full team” is present: technical person, sales person, marketing person and in some cases operation representatives from across business. And what would happen is they then look across at the ideas they like, talk about which ones they want to send to the level or basically which ones do they want to advance.

Then they start to advance those, always working as a joint group, some mock ups are done. It is at that moment that where operational cost and commercial implications start to be considered, and then they start to move through that process to eventually it’s commercialised.

It is important to say that in more than 70% of the participants said that environmental issues are “normally” taken into account at late stages of the process when developing time has been invested already and decisions of going back in the process are restricted by time and money.

“… and it is at this stage when we would have a brief discussion of the environmental issues that might arise from this particular packaging solution, and try to figure out ways to minimise that impact within cost constraints”.

It is important to acknowledge that moving towards sustainability involves re-assessing the way processes are undertaken and decisions are taken in the development process: typically the packaging development responds to a brief written in most of the cases by marketers, where the input of the designer is still limited as they rarely have the profile or context to be involved in decisions early in the development process (ISO 14062 2003, p.26).

5.3 **Sustainable packaging**

It is important to make a clear distinction between ecological and sustainable product design:

- **Design for Environment (DfE)** is concern with economical and environmental aspects, whereas Sustainable Design embraces a more holistic approach taking into account the social aspects in conjunction with economical and environmental aspects. According to Lewis & Gertsakis (2001, p 13), DfE is:

“…an approach to make critical interventions early in the product development process and eliminate, avoid or reduce downstream environmental impacts whilst still producing a high quality, cost-effective product”.

- **Sustainable product development and design** is defined by the UK Department of Trade and Industry (2005) as:

“…concerned with balancing economic, environmental and social aspects in the creation of products and services. Sustainable product development and design looks to minimise adverse sustainability impacts and maximise sustainable value throughout the life-cycle of the product, building or service. To create sustainable products and services that increase stakeholders’ ‘quality of life’, whilst at the same time achieving major reductions in resource and energy use, will require a significant emphasis on stimulating new ideas through higher levels of creativity and innovation.”

The same design principles apply for packaging. However, it is important to say that it would depend on the specific context and type of product is considered. It also has to addres economical and social issues. The australian-based Sustainable Packaging Alliance describes a sustainable packaging must be: effective, efficient, cyclic and safe as shown in Figure 3:

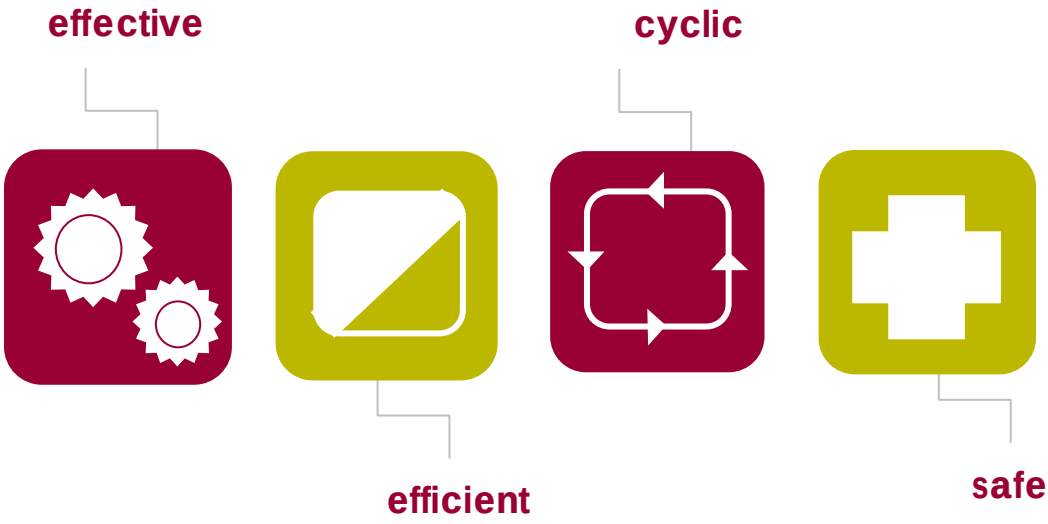

Figure 3 : Sustainable packaging principles (adapted from James et al 2005)

When intervieews were asked: “Define what sustainable packaging is from your perspective?” most of the answers refered to materials, i.e. recyclability, light weighting, etc. Very few did mention water and energy concumption. In general, there is a confusion on what could be sustainable and what are the biggest issues when talking about packaging sustainability.

6. Remarks

To this point no final conclusions can be made, however significant amount of data has been analysed and general views on packaging sustainability in the Australian context can be identified:

- Design is recognised as a key influence towards mor sustainble production and consumption practices, however, it has to overcome the missconception of being an “extra” cost to the process.
- Retailers dictate a lot of what happen in the market, so they could set the parameters to define what means sustainable packaging for Australia, instead of adopting isolated solutions from overseas.
- A lot is driven by consumer expectations, however educating the consumer as a key issue to achieve sustainable packaging systems and this could be done through design
- More emphasis needs to be put to critical links between packaging design and its ability to be collected and recycled through various materials recovery systems.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Being Here

Attitude, place, and design for sustainability

Craig Badke[1], Stuart Walker[2]

Abstract

This paper offers an original contribution to the current debate about *design for sustainability* by considering two quite different understandings of our relationship to the world – namely, *having* and *being*. The differences between these two notions emerge from a reflection on two places of outstanding national beauty – one in Canada and one in England. The discussion then moves to the urban context to consider the notion of *being,* rather than *having* within the contemporary city. There emerges an understanding of meaning that is deeply related to connecting – with people and place, and a notion of design that is both from and for context.

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Introduction

This discussion explores the shift in understandings that must prefigure any lasting change towards sustainable behaviours. More specifically, it considers a shift from *having*, which is implicit in the term 'consumer society', to *being*, a term that suggests a quite different and potentially more sustainable relationship to the physical environment.

The discussion begins with a reflection on two places – one in Canada and one in England – both of which are renowned internationally for their outstanding natural beauty. It considers our relationships to these places within our contemporary, consumer-oriented culture. These include more traditional, rural relationships to place, and the contemporary relationship of urban dwellers who visit such places for recreation and sport. The discussion then moves to the urban environment itself – and insights gleaned from reflecting on natural environments inform the discussion about what a meaningful and less consumptive response within the urban context might mean. The result challenges our current norms and conventions and offers direction for 're-connecting' within our everyday environment. Finally, the paper indicates what such a re-connection implies for the way we go about designing our material culture.

Banff | Keswick

Place and Consumer Culture

One of the authors lives a short distance from the town of Banff in the heart of Canada's first national park, the other lives close to Keswick, in the centre of the English Lake District National Park. Both places are areas of outstanding natural beauty. A walk along the main street of Banff townsite reveals a busy shopping thoroughfare; almost every other store is an 'outdoor gear' retailer selling apparel, hiking boots, skis, mountain bikes, canoes and climbing tackle. There are a host of outlets offering whitewater rafting experiences, trail rides, glacier trips and heli-skiing. The highstreet of Keswick in the United Kingdom offers a surprisingly similar array of shops, selling the same clothes, boots and packs, along with cross-country biking, boat tours, climbing excursions and GPS training days. Both regions have annual mountain film festivals that screen identical movies of people engaging in extreme activities within the natural environment. The 'great outdoors' is a major focus of both towns and it is the basis of their economies, it is also the case that the emphasis of both towns is tourism and therefore consumeristic. Both offer very similar visitor expressions and these are both about *having* – having the right gear and having the right experience. This emphasis is in accord with

contemporary capitalist societies, and it helps create wealth and jobs. Despite the fact that these two places are thousands of miles apart, that they have different histories, climates, and geographies, their commercial offerings in terms of possessions and experiences, are almost indistinguishable. Despite the fact that both towns are in the heart of major national parks, their stress on retail and shopping would seem deeply ironic, given the evident relationship between consumption and environmental destruction. More importantly in the context of this present discussion, this emphasis on consumerism is indicative of attitudes and behaviours that have come to favour *having* over *being*.

Banff | Keswick

Here we ask, “What does it mean *to be* in the environment, rather than *to have an experience* in the environment; an experience that, in turn, is dependent on *having* the right ‘stuff’. The distinction here between *being* and *having* is crucial to our understandings of, and responses to, sustainability. *Having* such experiences means that the environment is appreciated primarily for its instrumental value, for its ability to provide us with an exhilarating view, or mountain bike ride or ski route. *Having to have* just the right gear, in order to *have* the right experience only reinforces attitudes that are consumer-oriented and, perhaps, too-readily justified - often on rather tenuous grounds that are already primed for us by clever marketers.

How might a different understanding begin to change our relationship with the world, one in which the emphasis shifts from primarily *having* to a more balanced understanding that includes *being*? And what might this imply for advancing our approaches to wealth creation and ensuring human wellbeing? More specifically, what might this imply for design - what we design and how we design?

The notion of *being* rather than *having* is more in line with long held ideas about meaning and the notion of living a meaningful life, a contented life. By contrast, continually wanting, buying, acquiring - be it outdoor gear, outdoor experiences, or any other form of consumeristic behaviour for that matter, implies a discontentedness. Wanting something implies getting, working towards having, possessing. This type of thinking is part of our contemporary *having* culture - a culture that is associated with consumption and discontent or lack of fulfillment. Beyond a certain, moderate point of material satisfaction the premise at the heart of consumer-based capitalist systems is not only hollow but clearly highly destructive. It suggests that we can acquire happiness through wanting and then having, but this is patently false, at least according to the great philosophical and spiritual traditions from all cultures.

This discussion is about design for sustainability, not national parks. However, the example of our experiences and expectations in relation to national parks is symptomatic of our wider attitudes and behaviours. When we find ourselves on a hiking trail, ski slope, or mountain bike route we are usually there to satisfy our personal desire to have an exhilarating experience. In which case we are not *being* we are *doing, using,* or *consuming*; we are there *to have* an

experience. We walk along a trail in our ‘gear’, made by North Face or Columbia - seemingly, the label *is* important - until we arrive at a viewing point where we are invited, via a sign or strategically placed park bench, to appreciate ‘the view’, little realizing, perhaps, that the very notion of ‘the view’ is itself a Modern construct, a product of how we relate to the natural world, where we see it as something to be viewed, as an aesthetic object, a commodity (Eagleton, 1990, 78).

Having? | Being?

Place and Traditional Culture

Our contemporary relationships to the natural environment within the economically and industrially dependent societies are quite different to those of other cultures. Traditional aboriginal cultures, such as the Blackfoot, once thrived in Alberta before Canada was created as a colony of the British Empire. Their way of life was sustained for over 6,000 years through the hunting of the buffalo. Their hunting grounds, like the one at Head-Smashed-In Buffalo Jump, just south of Banff, where the great plains meet the foothills of the Rocky Mountains, exist now only as a UNESCO World Heritage Site (Head-Smashed-In, 2008), but provide a record of their relationship to the land and to nature. Such cultures lived with abundance as we do, but they took only what they needed - practising reverence for the way they took life, which was ritualized in every aspect of their culture. Every facet of their lives was imbued with significance, and for them their way of life was not divided into means and ends. The entire act of hunting, from the creation of tools and weapons to a social life, centered on following the herds, killing, cleaning and using every part of the animal. In everything they did they gave thanks for the sacrifice that the animal had made, which allowed them to live. In this way they were profoundly connected to the means of their existence (Snow, 1977, 76).

Similarly, today, an Albertan cattle rancher with his horse or an English sheep farmer with his dog also have a deep knowledge of, and connection to, their respective environments, to the weather, the land, their animals, their community, and even their tools. Such rural cultures are so dependent on and reflective of land and place that one’s life and how one lives are fused together. That life is pursued alongside people with similar understandings of and relationships to the land, which, in turn, generates a complex web of ties and interdependencies that are not merely instrumental. These types of relationships to place are ones of deep connection, where the whole of one’s existence is reflected and recognizable in the patterns of one’s life, one’s actions, artefacts, and surroundings.

Banff | Keswick

In so many ways, these kinds of relationships, exemplified here through the Blackfoot, the cattle rancher and the sheep farmer, can be characterised as more ***being* relationships**, and they stand in stark contrast to the ***having* relationships** discussed earlier.

The Urban Environment

To *be* in our environment means to be in our everyday, ordinary environment. For a majority of the world's population this context of living has become the contemporary urban environment. Are there narratives for our lives today – lives lived out within these modern urban contexts – that are in any way similar, in terms of *being*, to those discussed above in relation to buffalo hunters and farmers? Are such meaningful narratives applicable within today's urban context? Or are such notions misguided or simply nostalgic? Are deep connections to place and the natural environment, and attitudes of *being*, at all relevant to the average city dweller today?

Both authors have spent a significant amount of time in Calgary, located just 90 minutes from Banff, as all the brochures state. Calgary represents a fairly typical North American urban experience, with a few distinctions due to its location and youth. Although the city itself is increasingly cosmopolitan it is archetypal in its suburban sprawl and generic shopping malls. It is a place of enterprise and opportunity that creates a character of newness, but also transience and anonymity. It is a place of immigration where people can re-invent themselves and create a new identify without judgment or the shackles of tradition, home culture, or family. All in all it is an experience that is not particularly unique among urban centres and one that could be had in any number of places around the world.

Given this type of urban context, what does place, and its relationship to *being*, mean to us now, if anything?

The basic tenets of a secular liberal society are that people have the right to live the lives they choose, where they choose, and social cohesions between them are voluntary (Rawls 1993, xv-lxxi). But a disconnection emerges if the only relationships between people are voluntary and/or social. Most people came to Calgary, and perhaps to Canada, for instrumental reasons. These might be very good reasons - seeking a better life, escaping from a negative situation, for opportunity, or for safety and security. Nevertheless, the reasons are often instrumental in nature. What is the meaning of 'place' for these urbanised, relatively new settlers? For many there are few established, deep connections to the context of 'here' – the land, the history, the meaning – primarily, 'here' is a place that is both new and one that offers instrumental opportunity.

In contrast to Banff and western Canada, the English Lake District has a very long history of settlement, rural farming and literary culture – it is a place of mountains and streams, of ancient stone villages, of sheep farming, small scale industry, and poetry and story – it is the country of Wordsworth, Coleridge, Beatrix Potter and John Ruskin. Despite its profound differences, for the weekend visitor from the nearby cities of Manchester or Leeds, the

experience is not so very different to that of the average Calgarian visiting Banff. The relationship is again predominantly instrumental and consumeristic.

Meaning

The modern world is strongly connected to the urban context – but how do we connect in a meaningful way to places within and from such a context? While we cannot, nor necessarily would we wish to, go back to some more 'natural' state of living within the environment, our contemporary use of natural places, such as Banff and Keswick, as recreational areas and weekend playgrounds, which serve as *escapes* from the city, perhaps indicates that we see our places of living and working as environments to be *escaped from* because they fail to provide the kind of nourishment, on a daily basis, that we need and seek.

As Taylor indicates, perhaps many of the problems we are faced with in modern life – a sense of meaninglessness and disconnection, an emphasis on instrumental reason, and a sense of alienation – all stem from the fact that, unlike hunter gatherers, who saw meaning and intention in everything, we no longer do (Taylor 1991, 3). Native peoples saw everything in their world as meaningful, full of intent and significance, a part of who they were (King 2003). Many such traditional lifestyles were afforded plenty of time to contemplate connections. For them there were no divisions between the aesthetic, art, religion, or science, because they were all interrelated. It is only in the modern world that we have such words and distinctions.

With the decline of traditional sources of meaning (religion, class, family, work, etc.) our identities have become increasingly hinged upon design and consumption (Lansley, 1994, p100-101). More and more we tend to be defined by the products we buy, the spaces we inhabit, and activities in which we partake (Sparke, 2006). With this shift in relationships, products have increasingly taken on greater social roles far beyond their functional utility. Consumption has become not just the major force driving the economy, but also a dominant source of social meaning. In this context, products are valued less for what they do for us and more for what they say about us (Lansley, 98). A car is not just a means to get you from A to B, it is a means of projecting your identity, a symbol of status, social difference and connection.

Happiness

With such relationships we separate things into means and ends, where we seek to attain some abstract, ill-defined notion of a desirable end, be it happiness, pleasure, or identity and everything in the world becomes simply a means to that end. As a result, everything that gets you to your goal loses any intrinsic meaning - all that remains is its instrumental value. In turning everything into a mere instrument we shift the meaning from a whole process to only the end result.

We have long known that pleasure and happiness associated with consumerism is fleeting at best, as there will always be a newer, *better*, market-offering that creates dissatisfaction with the things we currently own (Pye, 150). An identity built on such grounds is similarly one of transience - and therefore can be seen as rather superficial. Taylor warns that in order to avoid such triviality one's identity must be defined against a background of things that matter, whether that be history, nature, society, duty, religion, or something else of that order (Taylor 1991, 40). It would seem that many of our consumer relations have no such foundation, especially when they are tied to superficial notions of progress, technological determinism, marginal and often questionable notions of 'improvement', or technical or aesthetic obsolescence. Therefore, we see that the contemporary, marketed path to happiness as philosophically lacking – it does not bear scrutiny. Its false promise of happiness creates dissatisfaction and anxiety.

Davidson suggests that to understand an object, and to be able to judge the appropriateness and significance of our relationship to it, we need to understand not only how we

relate personally to that object, but also its relationship to others around us (Kent 1993). Thus the notion of background becomes significant. Emerging from the traditional Axial philosophies and teachings of Buddhism, Confucianism, Taoism, Socrates, or the Old Testament, all of which developed within urban environments, the notion of being is one where we see ourselves as part of a larger whole, be it community, the planet, the whole of creation (Armstrong, 2006, xiv-xvi). These ancient teachings have all said, essentially, that to see oneself truly, without delusion, one must know oneself and see oneself as part of the whole. Such teachings also tell us that self-knowledge against a background of meaning is essential to the notion of happiness. This is a very different path to happiness than that advocated by the advertising and marketing of product acquisition.

Alienation

Scruton takes this notion one step further, with the Hegelian theory of self-knowledge, to suggest that not only is there no form of self-knowledge in a 'private world', but *"there can be no self-knowledge in a world that does not [also] bear the mark of human action."* Implicit in this is seeing those marks of human action, the world of objects and our built environment, as reflective of us, our values, and our conceptions of ourselves.

If, however, those objects and environments are conceived, in an instrumental fashion, whether for wealth creation or utility, and determined by a cost-benefit ratio rather than being considered more holistically the result can be alienating for those who inhabit that world. This alienation arises in part because ordinary people perceive themselves as having little effect on the shaping of that world – seeing themselves merely as passive consumers of it. Scruton gives an account of this alienation, the alienation *"of a man so treated by his environment that, finding himself nowhere outside himself, he can find himself nowhere within."* The cure for such alienation and meaninglessness in the world, he goes on to suggest is that *"only by transforming the world into a visible and tangible record of things rationally pursued, can a man find a place for himself there: without that place there will be no self to furnish it."* (Scruton, 245)

Perhaps the problem within urban contexts is not that opportunities are instrumental, but, due in part to this alienating character, they *remain* instrumental and do not evolve and develop the layers of significance and complex web of ties and interdependencies that we see in rural or traditional cultures.

McLuhan and others have suggested that, given the connectedness possible as a result of mass-media and global communications technology, we are a global village (McLuhan 1962, 97-106). Does this mean we see the world as our place? Can the problems in the world ever be perceivable, understandable, and tangible at that kind of scale? Even with widespread knowledge of the scale of the current ecological situation, behavioural change has been very slow. The problem with globalized production and consumption is that we do not see what we take. We are disconnected from the resources and natural systems that provide us with the materials we use and dispose of. In other words, we are disconnected from the consequences of the way we live. This disconnection makes the problems in the world simply a set of abstract concepts that are 'out there' and 'somewhere else' – we understand them intellectually not intuitively, factually but not viscerally; and this is why we can so easily set them aside.

Independence

Independence and freedom from ties, is illusory in our world, a misperception born of abundance, fuelled by suburban living, the grocery store and shopping mall, the image of the car, work saving appliances, personal entertainment devices, cheap travel, and a whole host of concepts and objects that drive our economy - all of which were built upon a cheap and abundant source of energy.

However, the rising price of oil has led to the development of a new term, ‘fuel poverty’ (BBC 2008). It refers to people who can no longer afford to pay to heat their homes or run their ovens or stove top. This is a current example that shows the consequences when unsustainable practices begin to take a grip. Currently governments are planning to help vulnerable groups such as retired people and low income families with subsidies. This look to the government for help is telling of how fleeting our independence really is. This notion of independence is shallow and freedom without connection is meaningless (Taylor 1991, 4-12). We are never really autonomous, it is just a perception, a self-delusion created by abundance.

As long as the oil keeps flowing and the electricity, water, sewage and gas all work, and as long as the supermarket shelves are always well stocked and there's money in the bank we can continue with the delusion. But it is inherently false and inherently transient. It is also highly consumptive and very damaging - not only to the planet, but to our understanding of ourselves, our relationship with and dependence on others, and our relationship to the natural environment. It creates an attitude and outlook of atomism - of seeing only our individual selves and our individual needs and wants - without consequence, and without reference to the larger picture. It emphasizes individual rather than community, independence rather interdependence.

Connection

From their different perspectives, Wolff, a designer and Ratzinger, a theologian, have both written about getting things in the right order. Essentially, they say, if one gets things in the right order, in terms of priorities and values, then everything else will fall into place accordingly. Its about connecting ourselves to the entire process of living where creating, building, eating, moving, working, learning, recreation, and place all have significance, not as a means to something else, but all mutually interdependent and mutually informing.

Henry Miller, in Big Sur and the Oranges of Hieronymus Bosch, discusses this notion further in reference to the idea of community:

> *"What we are trying to suggest is that the solution for a cluttered, frustrated existence is not merely in moving to the country and attempting to practice 'the simple life.' The solution is in an attitude towards human experience which gives to its lesser enterprises-the obtaining of food, shelter and clothing-their essential harmony and balance. So often people dream of an ideal life "in community," forgetting that a "community" is not an end in itself, but a frame for higher qualities-the qualities of the mind and the heart. Making a community is the result of the happiness and the good which people already possess in principle, and the community, whether of one family or several, is the infinitely variable expression of the excellences of human beings, and not their cause...." (Miller 1957, 18)*
>
> Big Sur and the Oranges of Hieronymus Bosch, by Henry Miller, 1957

Design for Being – the heart of sustainability

Design reflects us and what we do. As designers, every time we specify a material, energy source, or manufacturing process, we set in motion consequences, effects, and impacts that can have a global reach in terms of transportation, labour, and wealth distribution. The products we conceive and launch into the world are propositions of how to live that have implications for the way we consume and waste, create identity and social connection, and think about community. We either reinforce ways of living or we create new ones, new behaviours, new ways of being, not all of which are predictable or controllable. Our values, our priorities, our choices, determine what we get. Design creates a tangible record of the way we live and act in the world.

Banff, Keswick and Torino all reflect the way we see, use, act, and live, they are a reflection of conscious choices and decisions by their citizens, designers, and civic officials.

While there are many efficiencies associated with globalized capitalism and production, it has in many ways led to an increasing sameness around the world; the mass-produced, global 'having' experience tending to wash away differences and the particularness of place. Sustainability emphasises the local, not only for instrumental benefit such as creating local jobs or reducing transportation, but also because there is a qualitative difference of cultural and aesthetic diversity, connection and appropriateness. Design for the local emphasises 'fit' and 'aptness', as seen in the vernacular architecture of Pueblo homes in New Mexico, the stone cottages of rural England, or the circular yurt structures still used by nomadic tribes in Afghanistan. Such design is born of intimate knowledge developed in response to the particularities of place, material, function, and culture. Design for the local encourages stewardship, responsibility, connection, and meaning, where our problems are not *'out there'* in the world, externalized and easily objectifiable, but *here*, local, accountable, tangible, vested. This is design within and for an interdependent, connected culture; a culture that is aware of and responsible for its social and ecological effects. It is design for a culture of *being*.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Designer as Agent of Change

A Vision for Catalyzing Rapid Change

Banny Banerjee[1]

Abstract

Sustainability is a problem of a magnitude and urgency that compels a fundamental reconsideration of the manner in we approach complex challenges. Traditional means that have brought us here need to make way for new trans-disciplinary paradigms.

The design field has demonstrated an ability to bring about effective transformation in abstract multi-dimensional issues. The paper examines the strengths and weaknesses of the "design complex" and makes a case for a trans-disciplinary approach shaped around design methodologies to meet complex problems such as sustainability.

This paper suggests a mechanism for design to assume a "meta-disciplinary" role, developing heuristics for creating trans-disciplinary systems with the "designer complex" being a core *meme*. In this new form of design, the identity of the designer would shift from "definer of systems" to "agent of change".

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> *"Our task is not to predict the future; our task is to design a future for a sustainable and acceptable world, and then devote our efforts to bringing that future about. We are not observers of the future; we are actors who, whether we wish to or not, by our actions and our very existence, will determine the future's shape" [Simon 2000, 601]*

1. Introduction

As the design field finds itself drawn into larger issues such as social innovation and sustainability, it prompts the question *"What role will Design have in the future in addressing the complex problems facing society and mutual survival?"*

The field of design due to its heterogeneity resists commentary or *operations* that apply evenly. Design is akin to a cosmological phenomenon containing many diverse worlds. Designers assume different roles as specialists in sub-fields such as industrial design or generalists who simply assume different modalities over varying periods of time. In its short history as a recognized field, the design field has undergone several transformations from craft based design, to applied esthetics, to applied (human and social) science, to a more involved science. (Findeli 2001, 7-9) Currently, the field is at an inflexion point where the larger forces are causing a widespread re-examination of traditional value systems within each design sub-culture. Given this tense moment in the history of civilization, with its unique challenges and the core attributes of the design field, it would be appropriate for the design field to assume a new identity with a fundamentally altered set of implications and sphere of influence.

2. A Shift in the Design Field

It is manifest that the design field is in the midst of a paradigm shift. While traditional forms of design, such as product design and furniture design remain in place, the centroid of the design field is in flux, with expanding boundaries creating a move towards much more complex and abstract issues. Accounts from diverse sources in industry indicate that the nature of design briefs, the sphere of project influence, average size of projects, the level of organizational hierarchy among client personnel, the degree to which projects are interdisciplinary, and the number of projects that are directed towards longer-term futures have all undergone rapid change. These indicators are more discernable in leading design companies, which might emblematic of a pervasive trend across the design profession. This trend is also manifest in the types of projects being undertaken in all major academic design programs in the world.

In industry, skills based design is yielding to "design thinking" which is being directed towards a different set of problems such as organizational transformation, defining new markets, designing new experiences, and contributing to corporate strategy. (Beckman and Barry 2007, 25) Due to an increased demand for a differentiation based on innovative offerings, designers are being asked to work on both the problem and the solution sides in increasingly ambiguous problems. In addition, business schools around the world are looking to embed design thinking in their curricula.

3. An Urgent Need for Sytemic and Accelerated Change

> "The time scales of modernity have collided with the time scales that governed life on Earth in premodern times. Every year, our industrial systems burn as much fossil fuel as Earth has stored up in a period of nearly a million years. At this rate, we'll use up the planet's fossil fuel reserves within the equivalent of a

second in geological time. The acceleration of the speed of human population growth means that in a single human lifetime, the Earth may lose half of its living species, species that took tens of millions of years for evolution to create through the process of speciation." (Thackara 2005, 32)

The 2007, the Intergovernmental Panel on Climate Control, presented a grim picture on global climate change: "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level." (Bernsein et al, IPCC, 2007, 30) One of the most critical attributes of these the large-scale issues is that they tend to have positive feedback loops and are likely to be growing at an exponential rates, creating a increased trend towards widespread instability. It is possible that the forces at play are beyond human intervention and it is too late to thwart dire consequences. However, in the absence of knowledge that it is so, the question that still stares us in the face is "*can we design ourselves out of the predicament we have designed ourselves into?"*

As Manzini pointed out, "what is taking place is actually a structural crisis, and that the global model of development is the true issue under discussion" (Manzini, 1994, 38). This structural crisis needs to be met with change that is rapid and exponential in its magnitude. There is no doubt that time is of extreme essence. But the human race lacks a good track record of initiating widespread changes that are rapid that yield results that are beneficial in the long run. Industrialization is a candidate for being such an example. Methodologies directed towards systemic change need to balance urgency with caution. If we are to attempt to find ways of addressing these issues, the approaches need to have the following characteristics:

- Be designed around an understanding of points of leverage (Meadows 1999, 3-19)
- Be creative, bringing about balance through innovative leverage of meager means.
- Designed for rapid change with built-in propagation mechanisms so that limited resources are directed towards self-sustaining phenomena bringing about change. Exponentially growing threats need to be met with exponentially scaled interventions.
- The mediated phenomena need to adapt to varying conditions: designers need to think in terms of paradigms and platforms rather than solutions.
- The approaches need to be built with control systems that regulate runaway trends and guide it away from undesirable results
- The methodologies need to be integrated and holistic in their function being sensitive to the tertiary effects on the entire ecosystem that it affects

Merely finding novel solutions vis-a-vis complex situations would be less meaningful than finding ways of creating platforms that support shifts in paradigms.

4. Design, a Uniquely Promising Player

Design is being recognized by the world of business for its ability to bring about radically innovative approaches. On one hand "design thinking" has demonstrated efficacy in dealing with abstract undefined problems. On the other, there is an increased recognition that the critical problems facing society such as sustainability are not to be met by the devices of any single field. The philosophies, with which we have conducted business, made decisions, desired growth, consumed resources, and in which various disciplines have acted in good faith all need to be fundamentally restructured if we are to meet the critical nature of the challenges facing us.

Many of the fields in the sciences and humanities are concerned primarily with characterizing phenomena and thus generating resources in the domains of knowledge and understanding that can then be utilized by the fields that *act*. Of the fields that place value in *action,* design is one of the few fields that places an emphasis on "what is the right thing to do" over "how to do things right". In addition, it is a field at the crossroads of the human condition,

technology, business needs, placing value in both the abstract level, and the operational details. As such it is singularly well suited to *generate* trans-disciplinary spaces.

The "Design Complex"

Nigel Cross, referring to The Royal College of Art report of 1979, casts design as a third distinct "*culture*" (Cross 2006, 1), one that has been neglected compared to the other two, namely humanities and the sciences. The structural aspects that render design into a distinct culture also lends it a certain promise in the face of the urgent and critical problems facing civilization.

What makes the designer a promising agent is not a single attribute, but the gestalt of the skills, cognitive processes, design methodologies, attitudes, and structural aspects. I will refer to this as the "design complex". The following are among the attributes are pertinent for casting designers in increasingly strategic roles, and the combination of which make design unique.

(A) Structural attributes that differentiate Design
   a. Designers are primarily concerned about what the future *ought to be*, rather than the defensibility of information borne out by the past. It is a deeply applied field.
   b. It is the designer's mandate to be *creative*. They simultaneously expand the problem space and the solution space. (Cross and Dorst, 2001, 425-437) Design activity begets new design problems allowing the use of "*design to design"*.
   c. Designers *multiplex* between the abstract and the operational, allowing each stratum to gain from the constraints and potential of the other.
   d. Designers create transformations between concept space and knowledge space (Hatcheul and Weil, 2001, 13) and hence have the potential to generate new paradigms, a key point of leverage (Meadows, 1999, 16-18)

(B) Cognitive models that are core to the design field
   a. Design uses *abductive* thinking (March, 1976), the "logic of the possible" in addition to inductive and deductive thinking, the mainstays of other disciplines
   b. Designers practice *eduction*, pulling out hidden insights and latent opportunities from obfuscated scenarios
   c. Design uses *retroductive* thinking, a cognition model that allows the designer to guess at the conditions under which a given phenomenon will emerge.
   d. The iterative method of working involving prototyping is a key derived cognitive model that is a highly effective alternate to pure analysis. This cognitive process possesses an inherent power of weeding out failure modes in *integrated* scenarios. I coin the term *helical cognition* since it is iterative and yet advances the concept state. This mode is particularly well suited to working on complex problems whereby inexpensive iterations allow for development of concepts on multiple fronts integrated within the complexity of the real context.
   e. Designers perform cognitive operations that yield novel configurations, which cannot be arrived at merely as a result of a prescribed process. Designers practice cognitive processes such as imaginal reasoning (Tversky 1969, 255), visio-spatial cognition, representational mediation (Suchman 1988, 325) and symbolic representation enabling "creative leaps" resulting in an increased potential for outcomes that have disproportionate impact compared to the means. (Prahalad, 2006, 2)

(C) Modalities of operation that are strategic:
   a. Designers conduct *synthesis*, creating configurations of value far greater than that of the components. It is particularly significant given resource sensitive scenarios
   b. Designers are comfortable with ambiguity, and have the attitudinal equipment for working on wicked problems (Buchanan 1995,14)
   c. Designers have the creativity and skills to create and communicate novel visions of the future which could then serve as a beacon for strategic roadmaps

d. Designers are effective in multi-disciplinary scenarios, catalyzing focus, fostering a culture of creativity, generating a shared vision and vocabulary to allow rich communication between disciplines that are otherwise language-blocked. Designers perform the important activity of story telling.

(D) Attitudinal, stylistic and cultural attributes

a. The designer is allowed to *opine* and to openly express that they *care.* The design community draws people with passion and emotion.
b. Designers are proactive and are inclined to act as opposed to simply gaining satisfaction from characterizing phenomena. Design is marked by pragmatism, ingenuity, and an impatience for tangible results. Designers, at heart, are builders.
c. Designers are empathic and human centered while at the same time being comfortable in scenarios involving technology and business. Design is one of the few fields that have an ability to integrate across psychological, cognitive, technological, social, economic, and business issues along with the ability to implement plans.
d. Designers share their methods and have the ability to transform people from other disciplines into "design-thinkers", allowing them to tap into their creativity and using methods other than induction and deduction.

While the "designer complex" holds much promise, the increase in the complexity of challenges in the design field has also exposed some limitations in the current tool-sets. The field simply has not had the time to generate methodologies to meet the new challenges it is faced with. This gap presents a significant risk of causing a swing in the pendulum, creating a premature loss of faith in the design field, thus resulting in the real value of the field to remain unrealized. While the value of the "design complex" is perhaps far more profound than is easily recognized, the gaps also create a significant impediment in earning the credibility that is needed among other disciplines without which designers would not be invited to take part in decision-making at the highest levels. New tools need to be developed such as ones to identify leverage points in a large system. The current methodologies serve to meet latent human desires and as such, the methodologies for "Human Centered Design" are at odds with the needs of the larger human condition, and I propose a move away from the term to "Impact Focused Design".

Key Areas Requiring Growth:

(A) Structural issues:

a. The design field is still in the process of finding a cohesive internal logic, and remains heterogeneous. Not all designers possess the training or breadth to work on multi-dimensional problems. The field lacks adequate labels that demarcate one school of thought from another.
b. Design projects tend to be one-offs. The field lacks the culture of extracting values and developing heuristics with universal applicability. By comparison, other disciplines such as business tend to track their one-off cases and maintain a universally accepted rubric.
c. Design is mostly carried out in the scope of a project rather than expanding on the needs of a sub-discipline. For example, the field of Mechanical Engineering might spawn a new sub-discipline such as bio-mimetic micro-robotics, which subsequently would form its own community and draw from the core practices of Mechanical Engineering. In contrast, design harbors generalists and designers capable of addressing multi-dimensional problems are habitual nomads, getting pulled into a health project on one day and an energy problem the next. An opportunity to create sub-disciplines around recurring problems is often missed.
d. Since design stands at the nexus of multiple disciplines, with the purview growing sharply with each passing year, it is impossible for a designer to be an expert in all the disciplines. And yet, often they find themselves having to make decisions that are best made with the help of a specialist.

e. Design is largely qualitative and resists dealing with numbers. But many of the arguments in important decisions are carried on the backs of numerical arguments. While emphasis on the qualitative gives power to abductive thinking and intuition, it creates a weakened platform for objective decisions.

(B) Cultural issues:

a. Design tends to rely on its creativity and often overlooks existing knowledge.
b. The culture of abductive and retroductive thinking places a higher value on novelty, ingenuity and effect, rather than defensibility, or the theoretical basis for action. This falls foul of the scientific community whose cultural emphasis lies in objectivity, repeatability, and the use of data to defend claims.
c. There exists an absence of a clear rubric for evaluation of quality. Quality tends to be ascribed in a manner that lacks consistency across the design field. Rigor is a personal choice rather than being forced by the inherent quality of the field. For example, it is possible to be far less rigorous in designing a new K-12 education system through design methodologies than a shell concrete dam that needs to resist an earthquake of a certain magnitude and nomenclature.
d. Designers tend not to be systematic about documenting their work. The inadequacy of data in the field prevents evaluation of the field by outside agencies or by themselves at a later point in time.
e. Designers design, they tend not to write. And much of the writing is carried out by observers of design and design theorists rather than by designers. This creates a gulf between design practitioners and design theorists, not unlike Art and Art History. Designed objects, while rich vessels for semiotics, falls far short of supporting communication that can enable the discourse needed to expand a field.

(C) Inadequate toolsets:

a. Design lacks the adequate research methods to query large-scale trends and phenomena. Qualitative tools such as ethnographic research are effective for identifying latent needs and uncovering incisive insights that inspire design but the same tools are not as effective in identifying system wide needs. An emphasis on ethnography often puts the value on human desire rather than the health of the systems that sustain humans.
b. Design lacks the tool-sets for mediating selection of solutions among a large array of possible concepts in complex multi-stakeholder scenarios when counter-intuitive optimization or conflict resolution is called for.
c. Designers do not possess adequate tools to assess large-scale implications of a proposed concept. Fields such as development economics are far better suited for such evaluations. Standard tools such as prototyping sometimes have limited scalability e.g. the effects of a new freeway system on a community cannot be probed through prototyping, however, with better documenting conditions, we might find that a given project might serve as a prototype for another.
d. Designers tend to identify points of leverage by intuition rather than by identifying the category of leverage, for instance the gain on a positive feedback loop. Often, points of leverage are counter-intuitive.
e. Designers often fail to express the value of their outcomes to another field when there has not been the opportunity to create common vocabulary. For example, for years the design field resisted the comparatively simple and potentially lucrative argument for a Return On Investment analysis on design activity, and to this date, fails to sell its wares to uninitiated businesses in the language of business.

(D) Lack of adequate mechanisms for advancement:

a. Design needs to build platforms for increased credibility. Peer-reviewed design journals are scarce, and the readership among designers is limited. There is a need for platforms that have means of maintaining credibility and yet suited to the designer's modalities of authoring and the type of content prevalent in design.
b. Academic institutions offer inadequate mechanisms for advancement in this field. There are too few world-class universities that offer PhD programs in Design, thus

creating a very small cadre of people who are working to advance the field. It is not surprising that many of the recent advancements in methodologies that have been adopted widely have come from leading design firms.

c. Designers in PhD programs, in order to conduct doctoral level work, often turn into "designologists" rather than remaining designers. Of the various categories of research work connected to design, namely research *of* design, research *for* design, research *through* design, and research *with* design, (Frayling 1991) the latter two have been neglected and need to be expanded in academic practice.
d. Designers have demonstrated an ability to be catalysts in fostering a multi-disciplinary culture, and yet there has been little thought given to developing heuristics for trans-disciplinary configurations, with methodologies for each class of complex problem.

5. A Meta-Discipline

Design is uniquely positioned to engage in complex multi-dimensional problems, and yet to do so effectively, there are many areas it needs to buttress itself in through collaborations with other fields. But in filling the gaps in its own methodologies, the bigger opportunity is for design to find ways of systematizing and expanding the nature of collaborations with other disciplines.

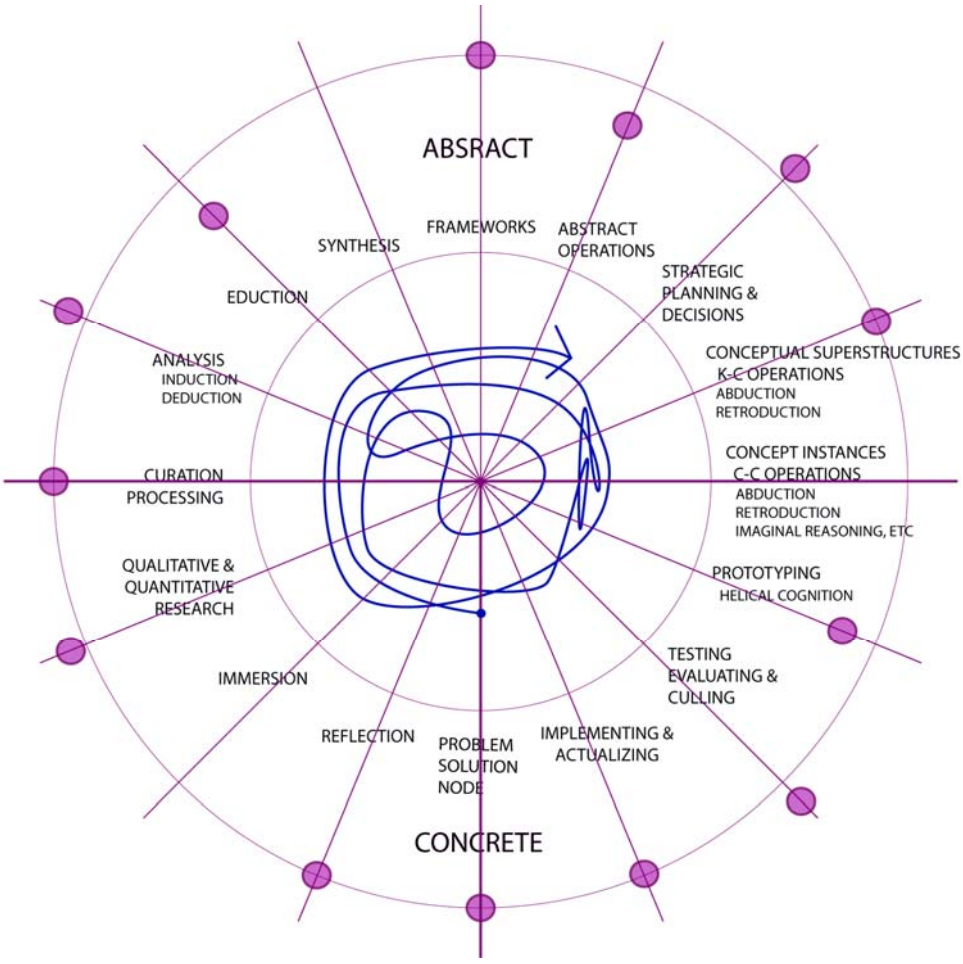

Fig. 1: The various modalities in the design process. The dots represent areas of possible collaboration.

Figure 1 depicts some of the modalities that the design process traverses in alternating between the problem domain and the solution domain, in both cases pulsating with phases of expansion and convergence. This process does not move necessarily in an orderly cyclical

fashion, and there are jumps taken between modalities, often with a rapid multiplexing between modes and between the abstract and the operational. The dots on the figure indicate strategic collaborations that would expand the field. The dots on the outside of the larger circle denote an expansion of large amplitude along a particular modality. For example, the dot on the analysis modality suggests collaboration with deeply analytical fields such as applied physics, systems analysis, or engineering research. On the other hand, the dot on the conceptual superstructure line might involve artists, science fiction authors, filmmakers, and visionaries.

A trans-disciplinary system integrates methodologies contained within discrete disciplines, sharing epistemologies and boundaries of practices within a common framework with a relevance to the special overall context and goals. Given that a trans-discipline creates a culture of its own, it can be seen as a vessel for a meta-level cognition. (Hutchins 1995, 354) The strategic and choreographed combination of discipline suggests a methodology for the creation of trans-disciplinary systems with pertinence to the specific class of problem. I will refer to this system of crafting trans-disciplines as “meta-discipline” (Figure 2). Meta-disciplinary methodologies are ones concerned with the creation of optimal trans-disciplinary systems that define boundary conditions, information exchange mechanisms, heuristics, a common syntax, shared epistemologies, temporal engagement patterns, handover protocols, and areas of discrete action, and above all, the rules and core values of the new discipline.

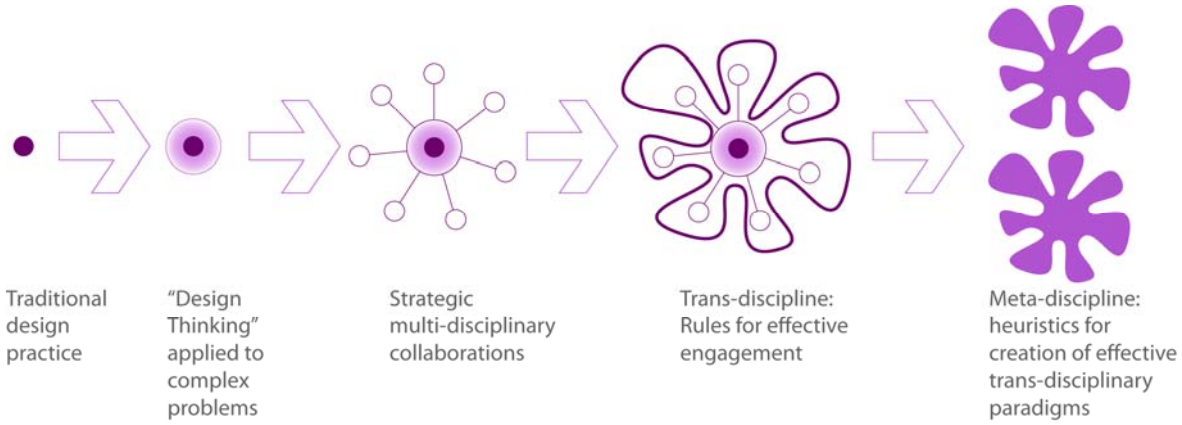

Fig. 2: The stages of progression from core design practice to Meta-discipline.

Figure 2 depicts how core design practice became more generalized in applying “design thinking” to problems not traditionally considered within the purview of design. We are beginning to see multi-disciplinary collaborations take place across institutions and academic programs. Systematization of the rules of engagement between sets of discipline yields a trans-discipline. The process of creating trans-disciplinary paradigms attuned to a given class of problems would constitute a meta-disciplinary practice.

Another way to look at this is through the use of a sports metaphor. If the objective in the game of soccer is to win by scoring as many goals while blocking all possible goals, then it makes sense for the ball to be passed to the player who is in a better position and with the skills to generate the best play. And while one player is in possession of the ball, the others move to positions that allow for optimal passing. The roles and skills of the players are different but sometimes interchangeable. Sometimes a play involves a pre-planned sequence, and at others a combination of finely honed skills and improvised moves. And everyone on the field agrees to play by the rules of soccer rather than lacrosse, but in special conditions like penalty kick-offs, the game assumes a certain different flavor. With soccer as a metaphor, a trans-disciplinary system exists in the context of a class of problems. The interplay of the different disciplines is to be choreographed such that the key strength of each discipline is leveraged, and the opportunities

for gestalt phenomena and emergent synergies are maximized. For instance, if the strength of development economics is in evaluation of large scale implications of a given option, and that of design in generating an array of creative options in response to a certain goal, then it makes sense to sequence the engagement of the fields such that the designers generate creative options, and the economist evaluates their potential large impact at a large scale. Rather than a discrete handover, if the process involves a deep collaboration, then the insights from the economist would inform the design, and vice versa.

In trying to create multi-disciplinary initiatives, we still find it hard to escape the philosophies of fields that were formed around the study of simple or "discipline-bounded" phenomena, As Hayek put it in 1964,

> "What we must get rid of is the naïve belief that the world must be so organized that it is possible to direct observation to discover simple regularities between all phenomena, and that this is a necessary presupposition for the application of scientific method. What we have by now discovered about the organization of many complex structure should be sufficient to teach us that there is no reason to expect this, and that if we want to get ahead in these fields our aims will have to be somewhat different from aims in the fields of simple phenomena" (Hayek 1964, 349)

Complexity requires that we rethink the way we approach problems. In the words of Herbert Simon,

> "We have learned very well that many of the systems that we are trying to deal with in our contemporary science and engineering are very complex indeed. They are so complex that it is not obvious that the powerful tricks and procedures that served us for four centuries or more in the development of modern science and engineering will enable us to understand and deal with them.."(Simon, 2000, 601)

While it might be philosophically befitting to think of the designer operating in a more rhizomatic paradigm (Deleuze and Guattari, 1987), acting as agents *within* a multi-stakeholder ecosystem, it is also appropriate to put design in the center of the action, and look at its potential in catalyzing trans-disciplinary systems to solve complex problems.

Currently, despite the number of multi-disciplinary teams coming together to work on complex problems, the process often involves exploring the *intersection set* of the view points rather than the *super-set* of possibilities for the unique combination. The rules of engagement seem to rely on finding a "common ground" which might limit the extent of the collaboration. While it accounts for some ground gained in empathy, shared epistemologies and vocabularies, the meetings often fall into a negotiation between the value systems of the different fields. In academia, another problem that arises is that of credibility within each domain. A truly trans-disciplinary endeavor stands outside of the rubric of any of the member disciplines and as such casts "projections" on the plane of each discipline, rather than being evaluated *in terms of* the core values of each discipline.

A trans-disciplinary outcome might be truly remarkable in effect and yet fall short of gaining credibility because it does not adequately push the boundary within each of the member disciplines. As such the credibility of a trans-disciplinary outcome needs to be measured within the rubric created for itself as a new discipline, or be pieced together by combining the viewpoints of each discipline, much as the geometry of a three-dimensional object can be inferred from multiple projections. Academic systems currently fail to provide adequate mechanisms for trans-disciplinary endeavors to gain credibility unless the work is exemplary within each member discipline. At a pragmatic level, universities tend to be compartmentalized, and a truly multi-disciplinary doctoral student finds it difficult to locate a patron who would fund them, without also having their study artificially skewed by the requirements of the department of their primary affiliation.

6. Agent of Change: A New Designer in a New Design Paradigm

The design field is uniquely positioned to be one of the key players bringing about change. The key attributes of the design field makes it a strong candidate in working on challenges such as sustainability, but this expanded role for the design field implies a fundamental shift in the designer's identity.

The identity of the designer is currently that as an "identifier of needs and definer of systems" (human, technological, business). The core values in design are practicality, ingenuity, empathy, and a concern for appropriateness (Cross 2006, 2). Without a radical modification in core values, it would be a subtle yet important shift if the identity of the designer were to be altered from being an "identifier of needs and definer of systems" to "agent of appropriate change" or "a catalyst for systemic transformation". A transformation of the identity would shift the inbuilt fetishism from the "elegance" of one's work, to the "impact" it generates. Albeit a subtle move, it spells a profound difference in the choice of tools and approaches, especially for those in the design field who aim to be thought-leaders and are willing to engage in trans-disciplinary work involving systemic change. Such a shift in identity would cause and be a result of fundamental changes to curricular structures, as well as in processes in design practice.

7. Meta-disciplinary Mechanisms

A mechanism that would allow for prototyping meta-disciplinary activity, and draw the right type profile of individuals to participate is not easily found. Academic departments tend to be insular and resist change. Laboratories that have a focus on a given domain build their processes around the needs of the domain. The problem lies in being broad enough to allow for meta-level questions, and yet be focused such that there are clear objectives. Such a mechanism must be designed to encourage sporadic and opportunistic membership, and yet serve as a mainstay for sustained work. It needs to be designed to redesign itself and morph to new structures as the understanding of meta-disciplinary work grows. It needs to be able to house multiple trans-disciplines so as to develop the meta-disciplinary practice. And it needs to work within real world constraints of resources and problem domains.

At Stanford University, we have been working on a formation of such an entity with an inherently meta-disciplinary structure. We have named it "The Design for Change Lab" (Figure 3) and its mission is to "Develop trans-disciplinary approaches to drive rapid change and large scale impact". The Lab's meta-disciplinary structure is aimed at expanding the design field, exploring means of bringing about rapid and large-scale change vis-a-vis critical problems. It is also forms a natural platform that would attract experts from different fields unified through common goals.

The Design for Change Lab provides opportunities for students and experts from diverse disciplines to engage in work with an *integrative* perspective. Part of the meta-disciplinary approach would not only be to configure the involvement of different disciplines, but also explore collaboration between different types of agencies. Rather than a specific domain, the ethos of this lab is structured around a set of values and principles.

The Design for Change Lab creates a novel precedence by combining the following values:

a. **Meta-Disciplinary**: A continual aim to define trans-disciplinary systems in response to a particular nomenclature of a complex problem. Integrating and configuring processes from different fields such as design, behavioral sciences, engineering, systems analysis, cognitive psychology, and economics to deliver a larger set of tools and processes. For instance, disciplines such as sociology that primarily *characterize* phenomena might now be asked to help craft tools that proactively create seeding functions of emergent behavior.

b. **Strategic combinations of players:** Creating unique configurations between groups such as universities, industry, individual experts, institutions, digital communities, venture capital, government bodies, non-profit organizations and social entrepreneurs to generate an integrated strategy. This combination allows research into *new methodologies and heuristics* for collaboration between disparate entities for effective deployment of ideas.
c. **Filter for large-scale impact:** Requiring projects to be directed towards those contexts and geographies, where scale, impact, and rate of change are critical parameters. However limited the scope of a single project, it is asked to be emblematic of a larger class of problem that is critical, allowing for extraction of value that is universal or transferable.
d. **Global Network:** Working as a node of an international network with active collaborations around the world will help including cultural issues and focus on projects of global relevance.
e. **Triangulation:** Work on multiple objectives at the same time in order to explore meaningful cross-pollination. The three main vectors i) Sustainability ii) Integrative Technology Futures iii) Dynamics of Change to afford a broad platform for trans-disciplinary work.

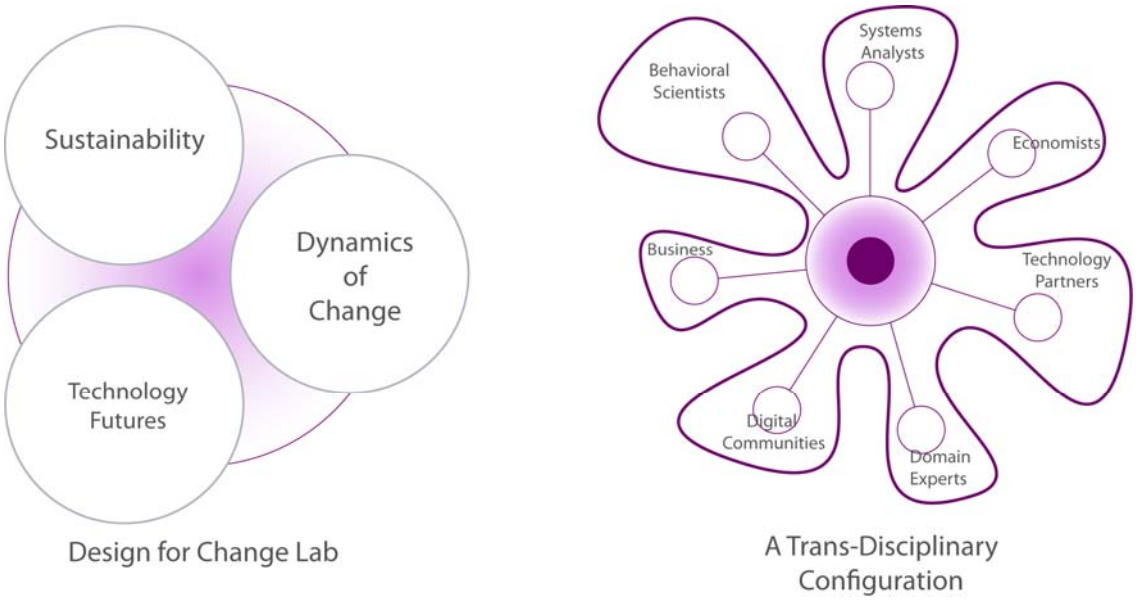

Fig. 3: The structure of the Design for Change Lab, and a proposed trans-disciplinary system.

The work in the lab will be organized along three vectors each of which might form a separate trans-discipline but the boundaries between them are meant to be porous:

a) **Sustainability**: Issues of global importance such as energy, water resources, climate change, and strategic initiatives involving environmental impact.

b) **Integrative Technology Futures**: Technology is one of the major frame-changers in society, and yet tends to not be directed with cogency of vision. Projects to carry out research on integrative technology configurations driven by long-term vision.

c) **Dynamics of Change:** Research on seeding functions of emergent behavior and the methodologies to catalyze and manage rapid change.

The creation of an aspirational, explorative meta-disciplinary entity such as the Design for Change lab will no doubt be challenging. It will have to attract the collaborative involvement of the right profile of people representing diverse disciplines, agencies, and roles. Apart from being a part of an international network, we feel that the being embedded in the Stanford Design Program and Stanford's "d.school", being located in Stanford University with its increasing openness to multi-disciplinary collaborations, on-campus multi-disciplinary institutes such as the Precourt Institute for Energy Efficiency, Woods Institute for the Environment, the proximity to other universities such as University of California Berkeley along with it's institutes, the entrepreneurial energy of Silicon valley along with its profusion of high technology companies, the increasing number of clean-tech companies in the area, and the proximity to design companies creates an rich setting for a node of such a meta-disciplinary endeavor.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Energy produced by its own territory

How outputs generate widespread business

Silvia Barbero[1], Franco Fassio[2], Cristian Campagnaro[3], Clara Ceppa[4]

Abstract

Two design solutions are described to suggest possible approaches for sustainable development in the field of energy. They concretely integrate production culture and design research in order to reveal the connections and congruencies, today still hidden, between artificial production and Nature. The first case deals with the production of renewable energy for the self-sustenance of a small-medium enterprise in synergy with the resources found on the local territory; the second case deals with the need to display products at environment-friendly fairs.

The challenge is to make even our daily actions sustainable, starting with our industrial energy needs. This is why social education is the most important element: a change in behaviors and greater sharing in the application of new lifestyles.

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1. Introduction

Energy is one of the basic factors that determine the competitiveness of a country's economy and the quality of life of its population. In network societies everything is kept together by energy and material flows: air, water, earth and fire, the four basic elements used by Empedocles to describe the world in which we live, are connected to each other (Pallante et al. 2006). Global times and spaces require a permanent availability of energy in its various forms, especially electricity (Donolo 2006).

The economic evaluation of energy provides a quantitative index of its importance. Suffice it to say that the price of oil has gone way above $100 a barrel, but only when we are faced with emergencies, such as the blackouts occurring throughout the world in the past few years, do we start to realize the qualitative effects of insufficient energy. These crises are becoming more frequent due to the growing complexity of our system. Globalized society touches the limit of its development and is becoming aware of its dependency on energy sources and its need to achieve sustainability for its consumption requirements.

The raw materials that allow us to produce energy take on a crucial supranational role and create worldwide political and economic scenarios. The situation becomes worse when the resources are non-renewable sources or sources that generate high environmental risks. The greatest energy demand is actually met in two ways: by increasing exploitation of the planet's resources and by conducting a more intensive search for energy efficiency. These solutions, however, create a vicious cycle that does not guarantee the long-term sustainable development we are hoping for.

Energy is a human right for self-improvement but it also a common resource needed by society as a whole. The legitimate expectations of energy procurement are only valid in conditions of limit or sustainability, following the ethical principles of responsibility and precaution.

A radically new approach to this issue, which goes beyond specific technological solutions, is therefore necessary to lead "global civil society" (Capra 2002) to redesign its flow of resources and relationships within its local context and generate multiple and complex solutions.

Below we have presented two design solutions that suggest possible approaches for sustainable development in the field of energy. The first case deals with the production of renewable energy for the self-sustenance of a small-medium enterprise in synergy with the resources found on the local territory; the second case deals with the need to display products at environment-friendly fairs that exemplify and demonstrate the environmental commitment of a company which is making physical contact with its customers/consumers.

2. Energy as product from territory

The broad scope of the first project proposed, involving a Piedmontese SME, Agrindustria, is to generate a new manufacturing and territorial scenario that modifies geopolitical relations and promotes development that is closely connected to the setting in which it is located.

This study focuses on a production, distribution and consumer context circumscribed and defined in the province of Cuneo, and involving active local entities on the territory:

- The Politecnico di Torino, with its course on Industrial Design, provided the theoretical instruments for an innovative approach to design according to the idea that "innovation is not found in continuous technological upgrades but in the angle from which you look at problems" (Bistagnino 2008) with a farsighted gaze. The ongoing research through the culture of the project, precisely because of its intrinsic characteristics, provides a change in how environmental issues are confronted.
- The Science and Technology Park for agribusiness, Tecnogranda of Dronero (CN), contributed to make the project's execution feasible, particularly regarding technical practicability; it verified the actual practicability of the technological details, the

economic feasibility by verifying whether the resources needed to build the system were justified by the foreseen returns expressed in the form of advantages, thereby contributing to the search for funding; lastly, it verified the legislative feasibility by exploring legal constraints and laws regarding the issues of energy, waste and the environment.

- The company, Agrindustria snc of Cuneo, contributed to the project in the way of organization to make sure the proposal could be carried out within its existing organization; it examined the logistics for providing the energy flows required; it provided a monitoring system to identify the parameters needed to correctly evaluate the trend of the project; it examined the motivational aspects to verify the actual degree of acceptability that users could express regarding the new system after it was built.

These actors helped make the results complete because to solve the same problem they became involved in a multi-layered discussion with each other to jointly find new directions in which to move. This enabled them to listen to voices from various sectors: design, industry, politics, the environment, social bodies, economic agencies, etc. None of these is autonomous. Quite the contrary, they are closely related to each other and together form a complex multifaceted system.

Specifically they discussed how to reduce the emissions of the Agrindustria production process by converting it from a linear industrial system, which produces waste as well as products, into a ramified system whose outputs become a resource for the company itself and other local enterprises. The system was designed in this specific company and territorial context because in order to acquire independence and autonomy the company must be in symbiosis with the local community and therefore the model cannot be exported *tout court* to other areas.

The narrow vision of the critical points and single productions of Agrindustria and the broader vision of the entire Piedmont system enabled us to delineate a complex systemic project and discover the "*hidden connections*" (Capra 1996) that add value to waste. The study thus structured led to the design of a complex system that broadens the production capabilities of the company and develops new activities in the local community.

The company achieved energy autonomy, both electricity and heat, by using renewable resources found directly in-house and on the local territory within a maximum radius of 40 km. The technical and technological decisions responded well to the company's needs and know-how, deriving from its 10 years of experience in handling and transforming biomass from farming activities. The production of energy from renewable resources, such as biomass, not only adds value to the company but also to the surrounding territory because it contributes to conserving the natural heritage of the area. This particular case involved cleaning out the underbrush of the mountain communities, eliminating manufacturing waste deriving from the production of pallets and crates. It favored the biodiversity of Cuneo farm products through the cultivation of mixed associated woodland using the biodynamic method.

Agrindustria currently transforms materials considered secondary in the farming and industrial processes (e.g. nut shells and corn cobs) to obtain fibers, meal, granules and products used in myriad production sectors (from mechanics to cosmetics). At the same time it obtains byproduct flour and sells it at low cost as fuel for power plants. The specific solution of this industrial waste of plant origin has led to the study of its value-adding potential in a **biomass-fed power plant**, the design and construction of which are the key for transforming the single linear industrial processes of the company into one complex system.

This allows Agrindustria to make a *trait-d'union* between agriculture (the cultivation of mixed woodland of authoucthnous trees) and industry (adding value to waste products) ***by taking output from its own manufacturing process to be used as input and at the same time improve the territory***. In fact several types of biomass can be recovered from the surrounding area which currently are unrecognized as valuable, such as the derivatives of **local products** (poplar bark, wood chips, scraps from the production of crates and pallets) and by **cleaning out**

the woods of mountain communities. The company stands on a strategic spot that allows it to obtain virgin wood by cleaning out the woods of its territory. This business allows many families to remain in the valley because it is located at the natural bottom of the valleys of Gesso-Vermenagna-Pesio, Stura, Grana and Maira.

The project of converting biomass into clean energy (electricity and heat) responds safely and locally to the problem of energy supply that affects our entire nation. Italy is later than the rest of Europe in its use of renewable resources. European Directive 2006/32/CE on the efficiency of the final use of electrical energy and energy services sets the goal for member states to adopt measures for obtaining an energy savings of 9% by the ninth year of application starting in 2008. In addition to a general savings in energy, the EU also establishes targets regarding renewable energy[5]. Italy has also drafted important program documents to promote and incentivize the use of biomass[6], but the ITABIA statistics (*Italian Biomass Association*)[7] show a steep divide between current trends and expected goals[8]. In order to reach these goals, it is vital that we respect the obligations of the Kyoto protocol (1992) for reducing greenhouse gas emissions and become more independent in our procurement of energy[9].

The project for a micro power plant for Agrindustria specifically entails conversion by combustion in an **adiabatic oven with an average capacity of 1.6 MWe** of biomass such as chipped virgin wood with the addition of flour from nutshells and corn cobs derived from the in-house production of granules. Though this plant is small it adopts **innovative** technology and has an important feature: it is easy to **operate** and **maintain**. Moreover, it required only a **small investment**. The production project entails the combustion of chipped virgin wood on a movable flat grill. The chips have 35-40% moisture and the latent heat contained in the combustible gases is recovered by means of a vapor generator to create electricity and heat. The **electricity** is produced by means of a combined turbine with an alternator. The vapor of the cycle must be condensed by means of a secondary fluid (water) with a low temperature rise (4°C). The water comes from a phytopurified fire-prevention pond [10] having swamp vegetation and water plants and is fed to the plant by means of a pump. The **heat** produced by the plant is directly used by the company and its production processes to desiccate, pasteurize and cook". In particular the virgin wood chips are used for the production of pellets to burn in household stoves. It also dries legumes and cereals, which are abundant in the Cuneo area[11]. The corn is dehydrated on the cob to obtain cornmeal for polenta in a controlled productive chain and cob, already used and processed by Agrindustria.

Cogeneration not only produces energy but also many high-quality products such as corn dried on the cob, which creates meal of high quality and organoleptic value.

In short the principal **products** produced by this new production scenario are:

- Virgin wood pellets from authoucthnous trees for domestic stoves;
- Corn granules for polenta controlled in the productive chain; the high quality of the product derives from the fact that it is dried on the cob, something that is hardly ever

[5] Directive 20001/77/CE, Directive 2003/30/CE and Reg. CE N. 1782/2003).

[6] The *Programma Nazionale Energia Rinnovabile da Biomasse* (PNERB), the *Programma Nazionale per la Valorizzazione delle Biomasse Agricole e Forestali* (PNVBAF) and *Libro Bianco per la Valorizzazione Energetica delle Fonti Rinnovabili*.

[7] Report *Le biomasse per l'energia e l'ambiente.*

[8] The total primary energy obtained from biomass in 2005 was 5.2 MTEP, which makes up 2.7% of total consumption.

[9] Based on the current trends, by 2030 the EU will be dependent on imports for 90% of its oil needs and 80% of its gas needs.

[10] The same fire-prevention pond was studied in a systemic vision to ensure the multiplicity of advantages to the entire company. Firstly the water resource on the property of Agrindustria was exploited: the water from a stream was used to irrigate the fields. This source is purified by phytopurification by authoucthnous plants and is oxygenated by small cascades and fountains. Then it ends up in pond with a high level of cleanliness. The water of the pond can be used not only for fire prevention (required by law) but also to cool the heating system of the power plant and to allow the proliferation of fish and algae (which expands into new business sectors). On the banks of the stream and the pond it would be possible to start an educational workshop for children from the elementary and middle schools so that they understand how environmental sustainability is not only an abstract concept but tangible even in industrial scenarios.

[11] A parallel study of all the farming products of Cuneo (grains, grapes, fruit in general) has led to the prioritization of certain typical products to be valued (Cuneo beans) and some discards that are still not used could be inputs in certain well-established processes of Agrindustria, particularly the scraps of the fruit orchard processes (kiwi, apples and peaches).

done anymore in Italy. Moreover the importance of this product has been endorsed by the establishment of the ONLUS Association *Antichi Mais Piemontesi* (Ancient Piedmontese Maize) whose members are local farmers and factories that cultivate or use traditional maize varieties (yellow and red Pignoletto, yellow, red and white Ottofile, Ostenga and Nostrano dell'Isola);

- Biodegradable compounds obtained by joining bioplastics and plant fibers to achieve high level mechanical, physical and environmental services/performances.

Several new **services** are also provided:

- green electricity, which is more valuable than electricity produced by using fossil fuels because it does not create the gases responsible for the greenhouse effect or other harmful emissions; what is more, it is renewable thanks to natural cycles[12];
- thermal energy, which entails the exploitation of the heat naturally dissipated by the micro-plant;
- education about sustainability, the desire to open the company up to the public to become an educational workshop is intrinsic to the philosophy of Agrindustria. To create an educational process that illustrates the content and potentialities of the project **reinforces the bond between the company and the local community**; acknowledgment of the qualities of the project and the company's way of operating in the territory becomes an instrument for spreading the culture of sustainability and the community's self-identification in and recognition of its local excellence.

The projects **strong points** are:

- The systemic vision of the entire company which enables it to reduce waste;
- An appreciation of the local territory and its biodiversity with the cultivation of mixed woods (elm trees, wild cherry trees, beech trees and cherry-plum) in associated 3-5 year cycles;
- Adding value to wood byproducts from the local SMEs (palette and crate making companies);
- Creating new jobs, in particular for the families who live in the valleys;
- A stimulus to clean out the woods in the surrounding mountain communities;
- The utilization of innovative technology compatible with the company's know-how and at low cost;
- The production of clean energy from renewable sources;
- The reduction of energy used by the production processes of the company thanks to the exploitation of the heat dissipated by the power plant;
- The increase in the number of services offered (electricity and heat);
- The production of new high-quality products (maize for polenta, virgin wood pellets, dry nut shells, corn cobs) with an consequent increase in revenue;
- A plot project that can be taken as an example, even though it may not be entirely exportable.

The project proposes a valid alternative to developing the discourse of energy procurement and emissions from power production worldwide[13]. The increase in natural catastrophes, in the

[12] Green certifications are the new instrument to incentivize the use of renewable sources of energy after the liberalization of the energy industry governed by D. Lgs. 79/99 (the so-called Bersani Decree). The previous law was based on Law No. 9 and Law No. E 10/91 and the CIP 6/92 provision: this legislation has succeeded in raising the awareness of society that the production of renewable or "clean" energy is not just a slogan but a focal point of sustainable development, the viaticum of progress which must not be perpetuated to the detriment of ecosystem.

course of the past decade are a clear indicator that climatic instability is intensifying; precisely while humans are abusing those services that would be offered by a healthy ecosystem. The analysis of the dynamics behind the present natural disasters shows that environmental tension and social tension are closely related. Poverty, the scarcity of resources and population growth create vicious cycles that lead to the deterioration of systems and local communities (Lanzavecchia 2000).

This global issue finds effective solutions only through local actions that are coordinated in a complex and all-inclusive way.

In this context it becomes increasingly urgent to implement actions that are sustainable both environmentally and economically. Agrindustria responds loud and clear to this need, made plain by the European Community[14], with its design and production system having low emissions and high energy efficiency. All the company's previous outputs are now properly used as inputs for other production processes.

Therefore the research demonstrated the design advantages of the systemic approach, leading Agrindustria to a change in human production activities in relation to the territory. Starting with the critical points closely related to a specific local scenario, we arrived at achieving widespread benefits for the environment, economy and society in general which have the potential to change local as well as international dynamics and relations that are both complex and delicate.

3. Energy as subject of the trade fair

To communicate these results to a greater and more diversified public we thought about trade fairs as a place where companies display the fruits of their skills in a given sector.

As a means for development, growth, consumption and as the "driving force" of the market energy serves humanity in as much as it feeds our "industrial" muscle as well as our "artificial stage sets", i.e. the trade fairs that display so many of the products generated by the economic system.

Trade fairs, an instrument for global exchange, are currently facing the energy issue mainly in the form of an opportunity for the company to exhibit. The stand is a likely reproduction of the enterprise placed in physical contact with customers/consumers: a stage which is set up to make known the organization and its products by establishing a contact between the company itself and its potential customers.

Energy at trade fairs has a dual purpose: it is an "object to be promoted [15] and presented in its various forms and as an "actor" of the exhibition, i.e. the power used to carry out the event. The latter aspect, however, until now has only been confronted shyly. Some bodies propose forms of certification [16] that prove the "clean" origin of the energy that feeds the event. The renewable resource that supplies the fair does not necessarily derive from the hosting organization; market strategies allow the input into the network of the amount required for the

[13] On 11 December 1997 the Kyoto protocol was signed by more than 160 countries during the COP3 Conference of the Framework Conference of the United Nations on climate change (UNFCCC) and global warming. The agreement contemplates that industrialized countries lower their pollutant emissions by 5.2% from the values of 1990 within the time span of 2008-2012. The agreement was drafted on an international level because the effects of climate change go beyond national borders and its repercussions are not only environmental.

[14] The European Union, which often acts as the champion of the Kyoto protocol, sets itself the ambitious goal of obtaining 25% of its primary energy from renewable sources by 2020. Particularly the Directive 2001/77/CE of the European Parliament and the European Council of 27 December 2007 lay out basic guidelines to promote the production of electricity from renewable sources and declare that the national goals indicated must be compatible with the global goal of 12% of gross domestic consumption by 2010 and in particular 22.1% of the total consumption of electricity in the European Union must be produced by renewable energy sources.

[15] Numerous events have been organized to promote the sale of products and services associated with "more sustainable" forms of energy, amongst which we cite as examples the Renewable Energy Exhibition 2007 (14-17 February 2007, in Lyon France), Genera 2007-Energy and Environment International Fair (28 February-2 March 2007, Madrid, Spain), Energymed 2007 (Mostra Convegno sulle Fonti Rinnovabili and Efficienza Energetica nei Paesi del Mediterraneo, 8-10 March 2007, Naples, Mostra D'Oltremare).

[16] For example: 100% Energia Pulita-Multiutility, Energia rinnovabile-Life Gate.

trade fair. From this perspective we see a mechanism similar to the one set up with the credit market for the emissions of CO_2: formulas for global balancing that, if not controlled, do not necessarily favor local ad hoc projects or the development of the economy of the country where the event is being held.

The major risk, through the use of a certification, is sending the immediate short-lived message to visitors that – in a concise and often simplistic way – summarizes a broad-ranging and delicate issue such as energy production.

Otherwise, it is vital to communicate not only by content but also by form the strategies adopted by the companies to reduce energy needs of trade fairs by creating a direct and local connection between the source and the event without the mediation of certifications.

This approach was undertaken in-depth as part of a broader long-term project called ***"Salone Sistemico: un modello esportabile di manifestazione fieristica a ridotto impatto ambientale"*** which, in addition to energy procurement, considers all the other incoming and outgoing flows of the trade fair system:

- Stand construction;
- Waste production;
- Packing materials;
- Materials for onsite food consumption;
- Logistics for transporting the goods;
- CO2 emissions;
- The mobility of persons;
- Water resources.

Every area analyzed presented a comprehensive design scenario that aims at reducing the environmental impact of the trade fairs in the study: ***Salone Internazionale del Gusto and Terra Madre***.

The amount of energy needed to carry out and sustain these events must therefore confront a prioritization process of reduction and rationalization that takes into account the aforesaid factors. Only in this way can it adopt energy procurement policies deriving from the use of local renewable energy sources.

To this end **Slow Food** in collaboration with **Industrial Design of the Politecnico di Torino** and Fondazione ZERI, as well as numerous other partners, launched a design process to apply the systemic approach to the 2006 Salone Internazionale del Gusto and Terra Madre.

The systemic approach is coherent with the principles of the Slow Food manifesto:***"Good Clean and Right"***: three fundamental adjectives, closely connected to reach other, indeed inseparable, and which define in a very basic way the characteristics that food must have. Today food is entrusted with the communication of a cultural identity where biodiversity must be protected in the name of the new **"eco-gastronomy"**. In its search for genuine food, the original core of the Slow Food philosophy has become the foundation for a broader-ranging mission that urges us to consider, when defining the quality of a product, not only the importance of the food's taste and organoleptic qualities, but the food in its entire lifecycle. This includes the phases of production, promotion, sale, consumption and, lastly, the disposal or "casting off" of the product. From this **new** definition of **quality** comes the ethical obligation to take action to reduce the environmental impacts made by the trade fairs and other events organized by Slow Food: places where over 6000 wine and food products are presented, tasted, and sold.

The goal of this project, as part of the program of **Torino World Design Capital 2008**, is therefore the progressive reduction of the environmental impact of Salone Internazionale del Gusto and Terra Madre by creating a **network of interdisciplinary expertise** that examines the

different and complex design areas for promoting **new sustainable consumption scenarios and the management of outputs on a territorial level.**

The results of this research will be applied starting at the 2008 event, which will be the starting point for a **multi-annual evolutional process that makes the container congruent with its content** and promotes a Piedmontese model of trade fair events with reduced environmental impact, claiming its role as innovator and its function as educator that the *kermis* has had since its first edition in 1996.

Therefore the systemic approach as the "driving force" of a *sustainable development of trade fairs* makes consumers, producers and designers think about concepts such as **local**, **territorial identity**, **the reduction of environmental impact within the entire lifecycle of products, an output-input connection that values waste products**. This involves implementing a process of "**behavioral innovation**" that does not sacrifice the elements of trade fair under examination but optimizes the flows of promotion, exhibition and commerce, adapting them to the local territorial qualities for the purpose of **educating, protecting and promoting** a pervasive and shared environmental culture.

According to this outline, by joining ethics and expertise creatively, the study took its first steps during the 2006 fair and took a snapshot of the **current status** of environmental impact of the trade fairs being studied.[17]

From the energy point of view, to host the event during its entire lifecycle (pre-and post-organizational phase as well as the phase when it is open to the public) the trade fair structure needs a supply of approximately 9.200 kWh of electricity and approximately 250 m³ of gas. The amounts calculated in 2006 were not high but with other factors such as the production of stands, the energy cost of eliminating waste, the transportation of goods, the design of components and packing for food consumption at the fair, concur in an overall balance of implicit energy consumption that quite a bit more extensive. This is why it was necessary, first and foremost, to **verify the environmental correctness and reduction** of these single consumption levels and the many consumption opportunities provided during the trade fair to the human visitors before thinking about how to supply energy to the facility itself.

Without a doubt the major problems were singled out in the instability of the system for **the management of solid wastes** produced during all of the phases of the trade fair lifecycle (design, mounting the stands, fair activities and dismantling the stands), and the resulting accumulation of mixed waste material[18]. This also included places near the location of the actual exhibition of enogastronomic products.

If we compare the incidence of the trade fair event to the production of waste in the city of Turin and surrounding municipalities during the five days of the event, it is a significant percentage. The number of inhabitants is approximately 2,243,625 and the number of visitors was approximately 172,500[19]. These numbers clearly show how inside the trade fair there are too many opportunities for people to produce waste. Therefore it becomes necessary to use **eco-compatible materials for the stands various other situations at the end of the fair**, i.e. use paint and fabrics of natural origin, and when possible eliminate furnishings having a brief lifecycle (e.g. carpeting), choosing materials and components that are recyclable and reusable, **increase**

[17] **Salone Internazionale del Gusto** is the answer in the food trade fair field to homologation determined by the globalized market which penalizes small high-quality production. It is based on the concept of preserving cultural and environmental heritage associated with enogastronomy while revitalizing local micro economies. The simultaneous international meeting of food communities, **Terra Madre**, transforms Turin into a "*global food village*" by bringing together operators of the food sector from five continents to share ideas about the problems caused by intensive farming that harms natural resources. The aim is to build a genuine network of contacts and connections to reinforce the methods of local, traditional and sustainable production throughout the world. **Salone Internazionale del Gusto and Terra Madre** function as one big event in which the commercial trade fair, a place where excellent traditional food products measures swords with the market, coexists with the gathering of Food Communities which represent the life blood world wide agricultural biodiversity, the positive and concrete alternative to the damaging effects of the homologation of tastes and the globalization of produce.

[18] About 189,06 tons of which was differentiated and therefore properly appreciation by about 17%

[19] Statistics obtained from the *Rapporto sullo stato di gestione dei rifiuti* in the Provincia di Torino, 2005

proper differentiated collection of waste inside the trade fair and **confer the remaining outputs to appropriate plants that will add value to them or eliminate them.**

Moreover an important role is played by **the materials used for on-site food consumption** during the phases of food tasting. In fact at the last edition the use of plastic for these purposes generated about six tons of waste: plates, cutlery and cups of various sizes and types that could not be reused due to organic residues left on their surface. This led to the decision to use tableware that is completely biodegradable and made with natural materials.[20]

The means used for this new and hoped-for attention to environmental needs, even in the **packaging** of the food and wine products, must start heading down a path of self-analysis and redesign. The packaging must be an instrument that suggests new lifestyles and sustainable behaviors, going beyond the sole function of defense/protection and arriving at a new communicative function. A place where symbols and signs, the immediate messengers of new cultural values and territorial rituals that strongly challenge social changes already in progress (e.g., eating rapidly, the concept of food as a souvenir, single portions) in respect of the organoleptic values traditionally correlated to any given food product.

The modalities for transporting the goods and the delegates of Terra Madre, transporting visitors and operators who are exhibiting, are all factors that play a decisive role in the initial strategic decisions that aim to put in place corrective feedback and reduce implicit energy consumption upstream as well as the consequent emissions it produces. The volume of CO_2 emissions is estimated at about 1600 tons [21] to which we must add 6.2 tons of CO_2 emissions produced by the energy consumption of the facility itself.[22] Therefore we must think about good practices that might reduce these emissions and incentivize the visitors at the trade fair to use sustainable means of transportation, promote the use of local products for catering and adopt a logistics system for transportation of the exhibited goods designed to create as little environmental impact as possible.

Further attention should also be given to the control of the liquids that enter the plumbing system so they do not go beyond the normal amount of harmful substances established for households.

After adopting and promoting good practices and new design guidelines to reduce the overall energy needs of the area required to carry out the event, we drew up a strategy for procuring energy from local renewable sources. From an analysis of the Piedmontese territory we discovered a company that was particularly diligent and efficient in the production of alternative energies: the name of this company is Marcopolo Environmental Group. The ecological journey of this company started in the 1970s when it needed to treat the sewage it produced from cattle breeding. Today the group is an international entity operating in the environmental field with numerous patents and production processes for the "active" industrial valuing of waste and the production of energy from renewable sources.

The group is a strategic partner of the project “Salone Sistemico”, and will provide the necessary energy to the trade fair, putting on the market an amount of energy equal to the energy from the biomass plants using the residues of companies located in Piedmont.

- The main advantages of this energy production system are:
- The treatment of materials currently considered waste,
- The abundance of available resources that regenerate seasonally,

[20] This research and the development of products generated by renewable raw materials of agricultural origin have been contributing for years to this sector to reduce greenhouse gas emissions, energy consumption and the consumption of nonrenewable resources and completes a virtuous cycle in which the raw materials from agriculture return to the earth through processes of biodegradation and composting which do not produce pollution.

[21] The amount of CO_2 is calculated on the basis of the consumption of paper, CD-ROMs, and the mobility of the participants.

[22] It was therefore calculated that about 75,000 sqm of wooded areas, equivalent to the surface of Oval plus Lingotto, would be required to absorb the total CO_2 produced by the Fair (the time needed to absorb the emissions depends on the location of the wooded area, the type of trees there and their stage of growth).

- The easiness of extracting the energy,
- The low economic costs,
- Its potential fertilizing power,
- The nonexistent environmental impact of the amount of CO_2 released during energy production is equal to the amount stored during the growth of the biomass used.

The use of renewable sources for supplying electricity and gas needed for these trade fairs will allow us to take the first step (the research involves the evolution of design and applications distributed over several editions of the Salone Internazionale del Gusto and Terra Madre) to promote trade fair energy development with less environmental impact. The energy comes from the same territory and is generated by valuing outputs from different manufacturing processes.

The Salone Internazionale del Gusto e Terra Madre can therefore be considered a "*live/living event*" due to its dynamicity, its continuous involving that puts it at the center of the most recent internationalization dynamics of the country-system and sees it Increasingly connected to network processes oriented towards the development of the territory and visitor dialogue-education policies. It is a workshop where projects such as "Salone Sistemico" find room to represent, design and metabolize new trends and lifestyles, new alliances amongst producers, promoters and distributors, new languages that will accelerate the pace of dissemination of an innovation that restores dignity to the environment and in which development occurs by forming, informing, raising awareness, a sense of responsibility and the sharing of the same principles.[23]

4. Conclusion

In conclusion, these two projects concretely integrate production culture and design research in order to reveal the connections and congruencies, today still hidden, between artificial production and Nature. This will lead us toward efficient and sustainable scenarios. The application of the systemic approach in these areas enables us to reconsider the current industrial setup and distance ourselves from the consumerist vision, associated exclusively with the figure of The Product. We intend to put forth a new paradigm that considers **Humans** the center of an "ecological equation" that acknowledges the interdependency of social and natural structures. In this vision the role of life itself once again becomes essential in biological, ethical and cultural terms. We must recover our cultural and practical capacity **to delineate and program a flow of material from one system to another** in a continuous metabolization that reflects the way **Nature** operates, where even surpluses are valued by the system.

The challenge is to make even our daily actions sustainable, starting with our industrial energy needs. This is why social education is the most important element: a change in behaviors and greater sharing in the application of new lifestyles. The two studies debunk the preconceptions that sustainability is equivalent to hardship. Our habits and concept of well-being are still bound to the logic of "The more I have, the more I consume, the better I feel". These studies show us that a feasible sustainable future is no longer a technical issue and not even a conceptual issue but an issue involving values and economic-political will.

A company and a trade fair that develop new energy efficiencies with a sense of moral responsibility offer an economic model and new consumer scenarios that incentivize a change in mentality and spur people to take on the issue of facilitating energy procurement and reducing energy needs.

[23] The study will be presented at Salone Internazionale del Gusto in an installation placed at the entrance of Pavilion 2. It will show the design aspects, the applications of solutions to the 2008 edition, the partners involved and future goals.

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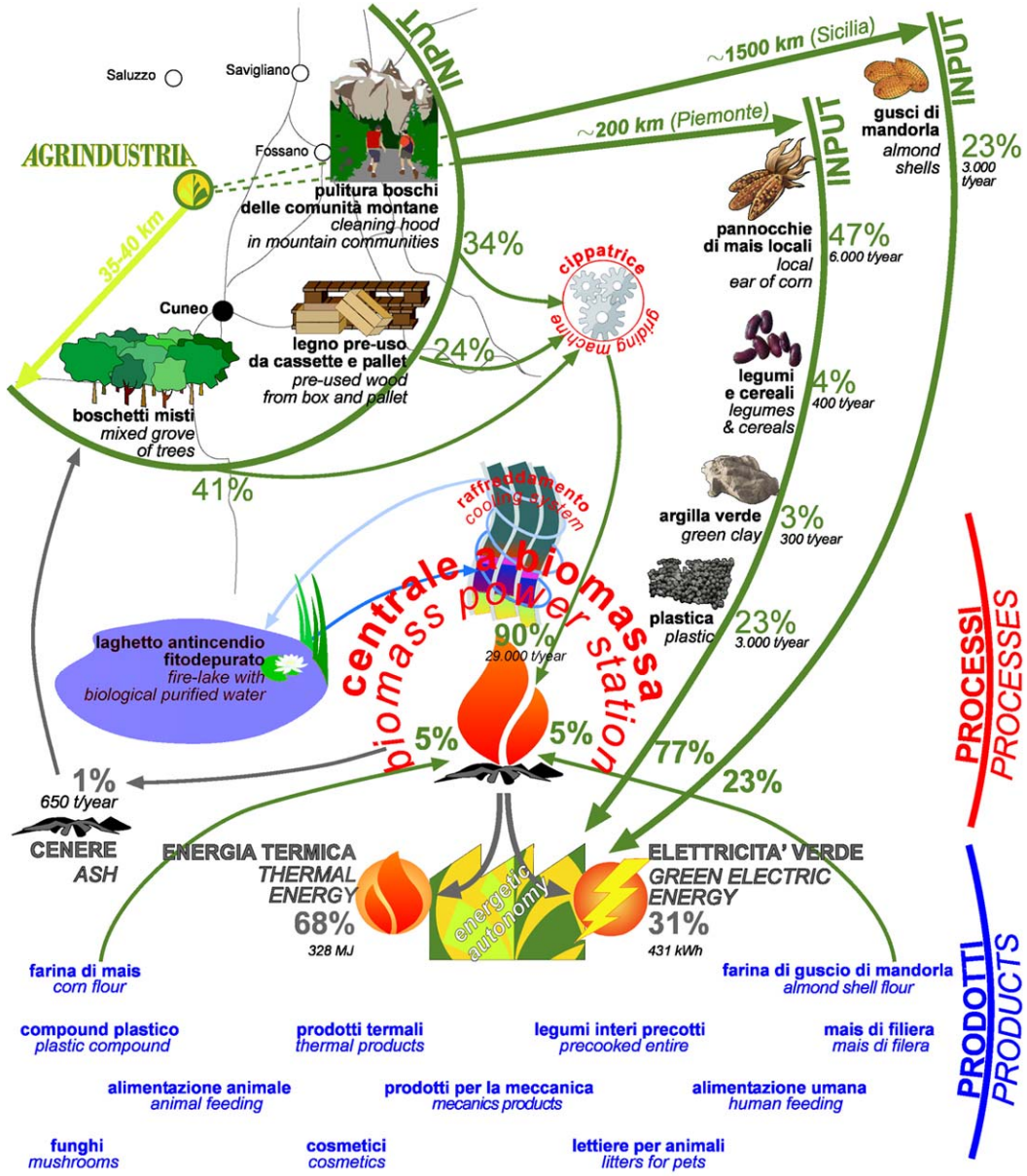

Fig. 1: Valuing resources according to their qualitative characteristics has stimulated the creation of new products and services that generate economic development and growth not only for the company itself but for the community in which it operates.

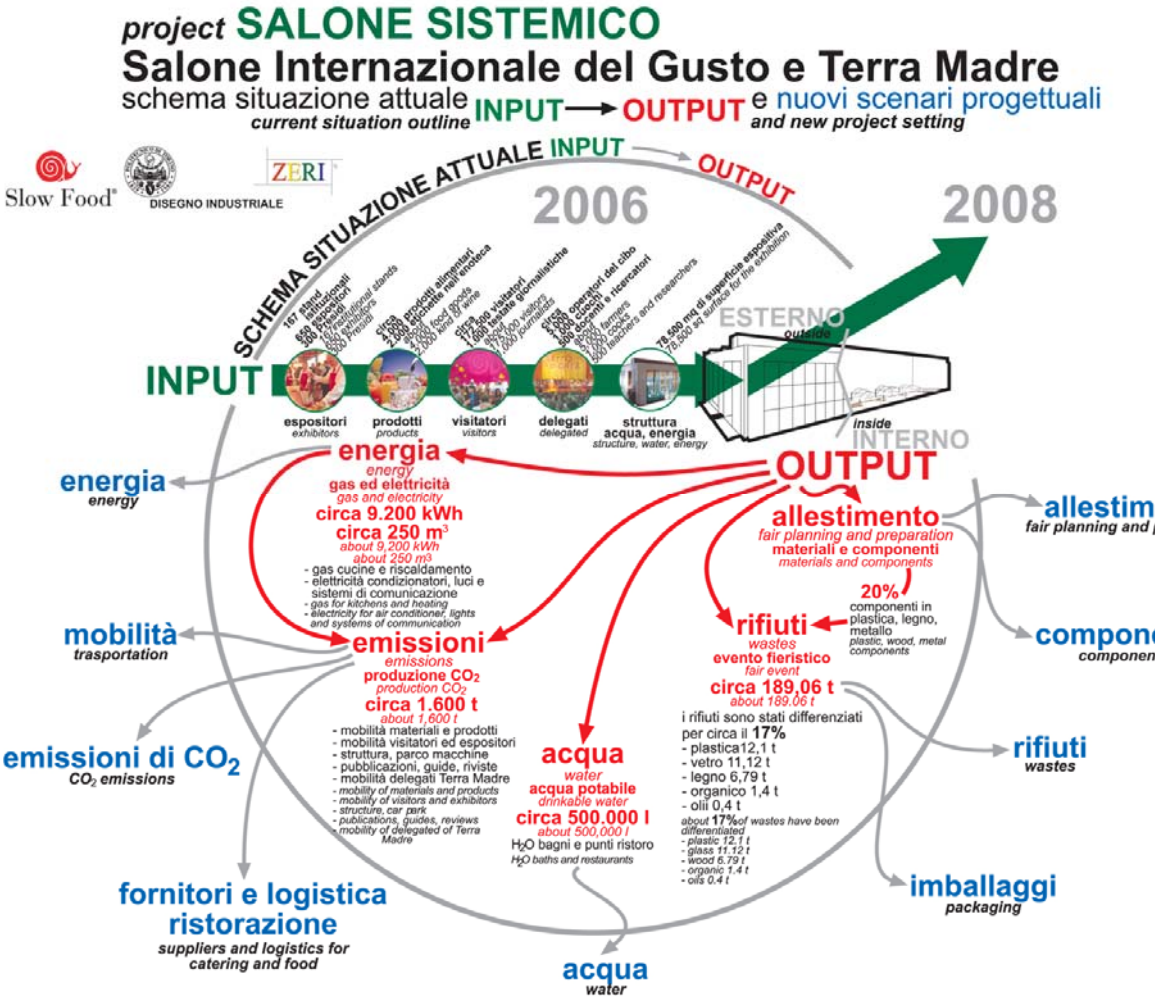

Fig. 2: The diagram shows the situation of material and energy flows implicit in the management and execution of the Salone Internazionale del Gusto and Terra Madre 2006.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Nomadic way of life
Design tools and policies

Lara Leite Barbosa[1], Maria Cecília Loschiavo dos Santos[2]

Abstract

The present article aims to enable designers to develop nomadic tools. Design policies that considers nomadism and sustainability at the same time are highly recommended.

The introduction defines some differences between travelling and nomadic life. After a brief description of the theoretical background, some possible nomadic groups are presented. According to sustainability, the nomadic tools are revised and design policies are defined. At the end of this article, a comparative table shows different possibilities of design solutions.

The results of this doctorate research are based on interviews, visits to design offices and a survey about mobile design and portable architecture solutions. The final purpose of this research is to produce design policies for everyday life of people with nomadic behavior.

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1. Travelling life is not a nomadic life.

According to the contributions of some authors such as Bernard Rudofsky, Victor Papanek, Ezio Manzini, Maria Cecília Loschiavo dos Santos, Robert Kronenburg, a revision about nomadism is presented. Teshome H. Gabriel, Jennifer Siegal and Robert Kronenburg were interviewed and their opinion gives support to the argument that there is a growing number of people moving from place to place.

The focus of the three interviews is to introduce conceptual and operational devices enabling designers to propose better ways for people who are constantly on the move practicing their everyday life. The survey focuses on the question "How can we sleep, eat, or practice any other basic activity considering the nomadic way of life?"

Teshome H. Gabriel was interviewed at University of California Los Angeles (UCLA) on february 7, 2008. He is professor at UCLA and he has written extensively on memory and the cinema, theories of Third Cinema, on the aesthetics of nomadic thought in cinema, and on weaving and the digital in developing countries. His philosophy is that the destiny of humanity is nomadic. The future of society is becoming more and more nomadic. The competition forces people to move around. And, most of times, the early life influences chooses on the adult life. To live in a nomadic way is one of them. Experiences teach us and travel is good to forget things. According to Gabriel, an urban nomadism seams like a contradictory idea. In a film Dersu Uzala by Akira Kurosawa, the cultural differences between a mongol peasant and a russian militar becomes very clear. The real nomad cannot live in a city: he needs to be close to the nature and to be free. But the city has a lot of rules and the space is almost claustrophobic. There is an ambiguous character in urban nomadism (Simpson and Stollmann 2007, 37-38). The contemporary urban nomads use the trash to survive, like the “free resources”, because the natural is over. Most of times, there are more opportunities in urban than in countryside areas.

Jennifer Siegal works in creating the Prefab home of the 21st century, she is founder and principal of the Los Angeles-based firm Office of Mobile Design (OMD). During her interview, in her opinion, the american economy of nomadism is very, very wealthy people or very, very poor people. Either they are forced to move, or they choose to move. Everybody in between, specifically people who are having children, tend to be more settled. At the same time, she thinks that anyone that is living anywhere has all the same needs. People who live in a kind of nomadism spent a lot of time outdoors and they have to be able to find security and shelter from natural elements, from the rain, from the sun. But they also look for places to clean themselves, take a shower, use the restrooms, socialize. We are all the same, no matter where we live or how we live, whatever economic structure, as human beings, a kind of needs are similar.

Robert Kronenburg teaches studio design, drawing and communication skills and contributes to the history of architecture lecture course at University of Liverpool. He is curatorial advisor on exhibitions like Living in Motion and Portable Architecture, subject which he has written and has published books about it. For Kronenburg there is a difference between travelling life and nomadic life. Nomad is people who lives in different places, with a repetitive cycle. Nomadism is about limited resources because they move when the subsistence is over. Sometimes it is controlled by the weather conditions, sometimes by work opportunities.

On the ther hand, flexible architecture, mobile architecture, is not necessarily about few or nomadic resources, because they have lots of resources, you choose to do it, but in a flexible way. One travelling aspect is that people go to other places, and back again. When people take their place with them and are moving from different homes, what changes is not only different geographic locations but the homes itselves. This kind of homes are not mobile. And so, in that sense, we need to adapt that place for a home. That is not nomadism. Kronenburg call this behaviour as anti-nomadic. Because the point of moving to those places is actually, embrace that different environment, and to be possed by, to learn about different environments. What happens

when people go to a new city is to look for familiar things, international institutions that are similar in all over the world and try to make you feel “at home”. The leisure nomads are attracted to go to somewhere, instead of the nomads who are forced to go, they migrate to survive.

This introduction aims to summarize the theoretical background of nomadic way of life according to the Teshome H. Gabriel, Jennifer Siegal and Robert Kronenburg interviews to Lara L. Barbosa. The nomadism specific meaning defines what are the mobility situations and the possible subjects involved with this.

2. Changing the work, changing the home.

The specific goals of this exploration are:

- Discover and find who these users are;
- Understand some needs and expectations in mobility situations;
- Produce databases of design solutions related to the research subject.

In view of these aims, this investigation can also verify examples of sustainable design for mobility situations. Two mobility situations are defined in this study: the change of home and the change of work. People are moving more and more over greater distances. Professionals have been transferred several times in short period of time. The nomadic groups can be those who stay in one place no more than a few months although, the period of stay may range from a couple of months up to five years. Distances follow the same pattern, having people moving to a neighbouring city or another country. But, in all cases, the equipment should be easily carried.

Although the characteristics between different users are very similar, there are details that have to be precisely accurate. Even so, in all cases the way that these groups transport their artifacts is one of the most important design problems. The design policies indicates that designers have to provide visibility for nomadic users quickly recognize what they need. The security is a problem as much for business nomadic workers as for recyclable materials collectors.

The research results about possible users notice that two possible groups are nomadic workers (NWs) and recyclable materials collectors (homeless).

The nomadic workers (NWs) travel to where the work is. To be considered a nomadic worker they must travel most of their time; they don’t have any bound with a particular office; their place is where they happen to be; they are constantly carrying and reconfiguring their own resources. This type is very urban, their site is the organization and the technologies represent their basic needs. The challenges that strategic design must focus are: to make easier the assemblage of actants, the way of seeking resouces and integrating with others (Su and Mark 2008).

David Craven and Nicola Morelli wrote about Logical Spaces for Urban Nomads: “the globalised society is leading more people to lead significantly nomadic lifestyles. Transportability can now be defined as consisting of either logical recreation of an environment or its physical relocation” (Kronenburg 2003, 22).

Since the pioneer Krzysztof Wodiczko starts to develop his critical vehicles in 1971, he attracted the designers attention. The recyclable materials collectors everyday life is concerned with the matter of mobility. So many times these collectors are homeless. They have to deal with very limited resources, they are forced to known and to adapt to different environments. The design challenges here are: preserve different termic and acoustic conditions from the streets to realize the basic needs, such as sleep or eat and to remain safe from people (Wodiczko 1999, 79). The home for homeless is like a portable home, without a specific place it can be anywhere in the city (Santos 2003, 32).

3. Nomadic tools according to sustainability.

They do complement each other: the nomadism and sustainability. The revision about nomadic tools suggested that it might be mountable and demountable human-made environment.

This tools could be portable, retract or wearable design, collapsible structures, itinerants and temporary services and the use of mobile equipment. Bearing in mind that those instruments are flexible, adjustable or transportable design, the first criteria could be the facilitation of the disassembly. This will benefit the transport and the recycling. But, there are new visions for how designers could develop nomadic tools if they include as possible answers strategic solutions such as the use of urban services. They can interfere in a building, a landscape, a sculptural yet usable object or an interior space considering different interactions.

For mobile consumption, different types of objects are created. Some utensils associated with eating on the move are very familiar in everyday life. The design solutions listed in this paper represents a growing sector in different cities all over the world. “From 2003 to 2005 the number of Swiss men and women breakfasting on the move increased by 246% (St. Gallen University), while takeaway packaging accounts for 35% of litter in Switzerland (Basle University)” (Wild and Reble 2006, 4). The wallet fish and chips tool, a display card made by recycled stainless steel, is a simple example of how design can change (fig.1). Starting from the Britains favourite take-away, this light and resistant object is develop to fit in the urban nomads pocket, with a credit card size.

Fig. 1: wallet fish and chips tool in United Kingdom, created by touch of ginger.

It is understood by the well-known sustainable design criteria the reduction of material and energetical resources. If you live in a smaller or compact way, you take less resources and became more sustainable because you don’t have space enough to unnecessary things. Even when you transport belongings using a car, or a truck, or go on a boat, or on a train, you force to deal with spaces, that are more compact. Also, when you arrive in a new location, that can be a desert environment, you need to find another way to survive without the urban cities infrastructure that you normally take it for granted . Who camps knows that you can create new communities, knew new people and it also makes you appreciate those aspects, like not having much water or not having electricity.

From another point of view, flexibility is like a design obligation. Constructions or buildings that can be used in different ways, in different locations, extends the life cycle design. In fact all design really extends the use, which means that is more efficient. And if is more efficient, is more sustainable. Nomads are doing this all the time: they need to re-adapt their resources to a new location everytime they move. If they don’t have access on where this knowledge about the local resources are, they have to research and memorize the information. When they do a constant route, they go deeper into a knowledge about the place and where is everything they need. This is essencial for diversity of uses.

Kronenburg also presents the advantages of portable architecture, such as:

- Ecological approach- they are recyclable, can be built using renewable resources, have a low site impact during deployment and minimal residual effect after departure.
- User friendly- the provision of a physically and psychologically rewarding environment for the building's user and occupants.
- Life-cycle costs- the long term value of the building in capital, maintenance and operating costs (Kronenburg 2003, 54-55).

The life extension design occur in different ways for nomadic communities because the time issues are very important for them. If we think in sustainability and consider the durability related with the understanding of how past, present and future are connected we can learn a lot of lessons. Where are the resources from? What is the best way to use them? How is possible to discard it or reuse it when the resource became obsolete? Nomads usually unifies this knowledge to live. Their transitional identity requires a more economic use of the territory which one demand that they leave the place when the local resource has finished.

4. Comparing design solutions.

Few references are found in contemporary knowledge. Not intending to exhaust this subject, this research seeks to bring visibility to significant results in São Paulo, Curitiba, Los Angeles, London and Liverpool. In every city, the goal is to collect different cases of nomadic behaviour and their design instruments.

It is recurrent the use of public space for nomadic groups, which means city equipments can be added to this investigation. Some solutions rise from forgotten places like abandoned sites, space under viaducts, shelters and bridges. In this emergent aesthetics, the resources are not only discarded products, but spaces as well (Santos 2003, 26). It is important to consider if the user interaction is passive or active, individual or collective, which will guide the project.

Compiled according to the similarity criteria, this selection has two kinds of answers: in a situation of living or working in motion. Most of the design ideas are like carts, what proves the importance of carrying things. Some of them are portable and lightweight objects, but are only used in specific situations. The proposals for mobility situations are, mainly, adaptable, and cannot be divided in usual cathegories. The examples are hybrid, between product and architecture, or even between service and design ideas. They combine a container function, like a bag or a box, with a vehicle solution, providing means of transportation.

The comparative table reveal how everyday life habits, when done on the move, requires different design solutions. Sometimes, trash is used as off the cuff material resource. Another times, the materials like the steel container, could be melted down and recycled.

Everyday life activity	São Paulo, Curitiba/ Brazil	Los Angeles/ United States	London, Liverpool/ United Kingdom
To live on the move	Plastic and cardboard solutions used by homeless (fig.2).	Shopping carts used by homeless (fig.4).	Budget Hotel, built with steel shipping containers (fig.6).
To work on the move	Textile apparatus with the system of "umbrella" (fig.3).	Baggage carts (fig.5).	Food Shop Traillers (fig.7).

Fig. 2: Homeless under the viaduct in São Paulo. Photograph by Lara L. Barbosa.

Fig. 3: Apparatus of peddler in Curitiba. The system of "umbrella" allows the informal salesman to collect the merchandise quickly to run away from the policy. Photograph by Rodrigo Boufleur.

Fig. 4: Homeless sleeping on the lawn, while his shopping cart is parked in downtown Los Angeles, United States. Photograph by Lara L. Barbosa.

Fig. 5: Baggage cart with disassembled stall, used by a peddler in Los Angeles, United States. Photograph by Lara L. Barbosa.

Fig. 6: Uxbridge Travel Lodge Hotel, a cheaper and faster construction built with 86 shipping containers, in west London, United Kingdom. Photograph by Lara L. Barbosa.

Fig. 7: Food Shop Trailler, trustingly parked near his rival in Liverpool, United Kingdom. Photograph by Lara L. Barbosa.

5. Changing to a nomadic way

In this sense, one positive contribution to "changing the change" could be a transformation in a nomadic life towards more sustainable use of resources. The design recommendations follows the nomads lesson:

- Facilitate the information researching and memorizing. Provide information about the place for multiple users, including where are the free resources like wireless internet or discarted materials or even about the weather conditions.
- Motivate the local adaptation, avoid importing cultures and behaviours extremely different.
- Develop alternative ways of finding security and shelter from natural elements, like the rain or the sun. The ability to adapt to different infrastructures conceives a creative knowledge. The “do it yourself” ability is essential for assembling.
- The integration with others must be motivate for collaboration, mainly in outdoors activities. The use of urban services can be combined with the possibility to share things.
- Develop a strategic use of the lightweight objects and materials. It can include the recycled ones, such as plastic and cardboard.
- Provide better and easy means of transportation. When the purpose is carry things, the weight must be low.
- The equipment can be mobile, portable or wearable. Sometimes the belongings could be carried with the wheels support or could be kept together with the body.

Possible nomads can teach us about better ways to practice our everyday life in a more sustainable prospect.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Influence of Design – Examples from Bangladesh

Design visions

Hannah Bauhoff[1]

Abstract

Globalization means media and new technology reach every corner of the world. TVs are found lighting the mud huts where villagers consume images from all over the world. More than ever lifestyle articles and products containing western ideas and values reach people who live in a totally contrary environment marked by poorness, bad infrastructure and less developed products. What happens when western glamour and products meet poverty? What means developing aid in the context of design in these countries? Based on my phenomenological studies and interviews with designers and journalists from Bangladesh this paper will show projects from Bangladesh, which symbolizes different attitudes concerning developing aid, the role of design, national identity and its adaptation to globalization.

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1. Introduction

There is a popular thesis about globalization and culture: Western economic power rules or changes traditional cultures. The result: the variety of different cultures – analog to the process of biodiversity – disappears (Juniou, 1998). Consumer goods, images and visions of life of different cultures and the overall pattern of living become equal. Daily life and popculture such as popmusic, fashion or productdesign look alike and become homogeneous.

Media plays a special role in these context. Media transports images of the western world and distributes them successfully. Whether in India, China oder Iran, Western goods are enthusiastically welcomed: Western popmusic displaces traditional music, traditional clothing as the sari is replaced with jeans and T-shirts and instead of tea the people drink cafe latte (Klein, 2005[i]). It seems that there is a generation growing up that is no longer sceptical, this new generation is “hugging the Western world” (Doctoroff, 2006).

This opening gives rise to many observations and is used as a point of departure for a discussion on the role of design in the context of development aid. The research question of this statement is: How could design be used to create self-awareness in least developed countries and economic success on world markets?

First of all, the definition of developmend aid has to be considered. Then – to answer this question – examples from Bangaldesh will be provided to give an historical overview of development aid since the 1970s for a better understanding of the delvelopment aid definition and function. Based on these examples, new directions for design are described to point out that it is possible to create a new direction in future development aid concepts. In addition the role of media and the question of national identity are discussed. Finally conditions for this vision are specified.

2. About development aid

The definition of development aid – the present term is development cooperation – means aid for so called least developed countries. It is given by governmental, private and economic organizations in form of technical aid and cooperation, knowledge, food to support the economic, social and political development. The overall goal of aid is to improve the living standard, the general economic, political and social climate in these countries, and support measures to improve the legitimacy and effectiveness of the state. Development aid is conflict prevention and aims to create a strong civil society.

In 1961 when the term developing aid was used the first time and the Organisation for Economic Co-operation and Development (OECD) in Paris was founded, the main idea was to increase benefits by giving former colonies financial support in form of credits – analogous to the Marshall plan in West Germany after World War II. In addition the donor countries suggested that food for the world population will be guaranteed by providing modern technologies for agriculture. Later conventions were designed to provide for most agricultural and mineral exports to enter the European market free of duties, but still the preferential access based on a quota system and all donnations were linked with guidelines.

However, from the 1970s the focus was put on women as a reliable partner for development aid. Women, so the experience, think more than men about their family and their enviroment. To support women will help finally more people in a sustainable way.

This fact was noticed by an American-Canadian non-governmental organisation (NGO) called Mennonite Central Committee (MCC), which was involved in development aid in Bangladesh since the independence in 1971 from Pakistan.

At that time Bangladesh (an it has not changed very much) was a small country with 150,000 km2, and one of the most populated countries in world. Its most important economic sector is agriculture where about two-thirds of the working population is currently employed. Bangladesh has only few mineral sources like oil, gas and coal. The manufaturing industry is less developped, the few big facilities produce jute fibre and textiles for the export. However, Bangladesh imports much more than it exports, so the trade deficit is high and the country depends on foreign help and foreign currency. Besides that, the parliamentary democracy is not stable, but a corruption and inefficient bureaucracy. The lack of public order and security makes daily life and business very difficult.

3. Fair trade by Aarong

The development concept of MCC is based on the high command of the village women who weave and embroider in special ways (Sajid, 2004). As women keep traditions alive, they have deep knowledge of old techniques in arts and crafts. The knowledge of these rural women was used and transferred to modern products designed by the staff of MCC. Actually, most of the product ideas came from the rural women, which had been surveyed by MCC. First the products were sold in the office of MCC mostly to development workers as a presents for home. Then a shop called Aarong, which means “a village fair”, was founded. The objective of Aarong was to provide a stable and gainful source of employment for the underprivileged rural artisans.

In 1978 Aarong was sold to BRAC (Bangladesh Rural Advancement Committee), a local NGO. In the process Aarong contributes to BRAC’s goal of poverty alleviation and empowerment of the poor. BRAC researched how to develop more items and to design more products based on old traditions, e.g. bloc printing for carpets. They revived old patterns and collected old techniques.

The concept of Aarong was and still is successful. Aarong has earned over the years a reputation as one of the finest rural craft producers and marketers in Bangladesh. About 300 people are working in the Aarong shop in administration, controlling, design or as shop assistants. There are 8 shops in Bangladesh, and one in London. In 1996 Aarong had a turnover of eight million Euros. The profit goes to BRAC and represents about a tenth of BRAC's total income.

Nowadays in Bangladesh Aarong customers are mostly middle class people. To Bangladeshis people means buying something at Aarong to offer something special or precious, but typically Bengali like Nakshi Kantha, a revivaled textile. Nakshi Kantha is an embroidered quilt said to be indigenous to Bangladesh. It is made from old discarded cloth, from utilitarian quilts to exquisitely embroidered heirlooms. Traditionally, thread drawn from coloured sari borders would be used to embroider motifs or border patterns imitative of sari borders. Yarn used for weaving is also used for kantha embroidery (Rahman, 2004).

Bengalis are proud of Aarong, although Aarong is not successful outside of Bangladesh. Aarong tried to open shops in Canada as in Europe but most of them failed. There are many reasons why Aarong products are not popular in Western countries and on Western markets. (Vogelsang, 1999[ii]): Western target group claim is different and depends on the consumer’s attitude or on the consumer’s life style than Bangaldeshis. And: clients want to satisfy their composition claims and impression claims, which is not possible with products from Aarong that could be found only in fair trade shops like tradecraft in UK, Caritas in Germany or Fair Trade Assistance. In fair trade shops Western people can find mostly products of low quality, or a lack of attraction beside “exotic” forms or material like bamboo (Koppelmann, 1997). It is the luxury/ the goodwill/ the philosophy to buy fair trade products but not the desire or benefit from the product. However, Aarong clothes and garments products do not fit to Western way of live. Especially users from industrialized countries are expecting a satisfaction of their composition claims. Aarong was and still is the typical fair trade company and it is a blue print for many other

fair trade companys as a result of an idea of development aid, which worked in the countries themselves. As the Aarong-idea is from the 1970s, new concept which adapts t globalization was demanded.

4. The idea of the Design and Technology Centre

Due to the changes in policies of the global RMG buyers, implementation of WTO agreements and significant growth of competing countries like China, Bangladesh was still unable to develop and diversify its industrial base and expand its export range. The narrow concentration on a few export items and a generally low value addition in the export-dominating RMG industry have kept the country increasingly dependent on a global trade environment. As consequence Bangaldesh is still dependent on its main trading partners like EU and the US and has to accept the conditions for development aid and for the RMG sector (see United Nations, 2002). Concerning the ideas of development cooperation contrary to the experience of Aarong, new approaches have been demanded. One new approach emerged in 1998 when the Dhaka Chamber of Commerce and Industry (DCCI) in financial and technical cooperation with the German Technical Cooperation (GTZ), a German NGO, created the Design and Technology Centre (DTC). Its goal was "creating awareness of design and product development as a tool of obtaining competitiveness" (Rashid, 2006[iii]) and its objective of DTC was to establish a product development centre where small and medium enterprises (SME) of selected sectors (primarily leather, natural fibre and wood) will be trained in design. Furthermore the idea of DTC was to provide SMEs with consultancy for better design and technology for their products so that they could be competitive in the domestic and the international market. In other wrords: DTC was a reaction on the dependency of Bangladesh on the Ready Made Garments Sectors (RMG) and the idea was to trhough enhancing hugely design knowdlegde Bangladeshi products would become interesting for international markets. Products made in Bangladesh are typically of low quality, absence of professional design input and – because of the practice of widespread copying – a distinct product identity. Even in the country itself the interest on design was very small – except for journalists who have started writing about fashion design while copying Indian and English articles from the Internet.

One endeavour to solve most of these problems meant to improve the design. This assumed solution raised a new problem: Bangladesh did not have any product designers because of the lack of design education at the university. DTC created a concept that tried to promote and institutionalized the profession product design. The concept was made according to the 1961 India Report by Charles Eames, an American industrial designer, and his wife and colleague Ray Eames. The Government of India had asked the Eames couple for recommendations on a program of training in design that would serve as an aid to SMEs and that would resist the rapid deterioration in design and quality of consumer goods. The Eames visited India for three months and explored the problems of design. The result of their study and discussions was a recommendation for a training programme that resulted to establishment in the National School of Design (NID). As teachers they recommended architects which had been sent to different design schools abroad to get an idea of different design education. They should be trained not only to solve problems, but what more importantly, they should be trained to help others solve their own problems.

DTC took up to this idea and "imported" German design know-how and machinery with the aim to transfer of technology, design knowledge and production modes. Undergraduate design students from Germany as well as local architects provided the design education. Since DTC' self-image was and is being a service provider in product design for SME in the sector of product development, it also offered services such as training for selected sectors and on-the-job training as awareness programs like design competitions. With the different facilities, a small library, workshop facilities with selected machines for different materials (wood, textiles, paper

and leather), one small seminar room and one room for exhibition or seminars, DTC tried to create the awareness among the local industry and handcrafts.

But still, DTC efforts – to create accessibility to new markets of Bangladeshi products and to create employment opportunities – failed more or less (Rashid, 2008), although the DTC got more fundings from the Eurpean Union after the financial cooperation with Germany has ended after five years. Reason for this failure are diverse, but the lack in the information policy of DTC with the consequence of little awareness of DTC project in Bangaldesh and abroad. It would have been better to investigate in parallel the overall professional presentation and appearance of the idea. Linked to DTC objective to raise awareness about design, journalists should have been contacted and trained to become design experts for having profound discussions about design that are eeded to develop the own design knowledge and identity. should have been started. The existing magazines and articles are only copies of Western or Indian magazines/ articles. The absence of information exchange with the international market created the problem. Besides the service staff, the executive, marketing and finance department, DTC employs one local senior designer, two local junior architects, one local junior graphic designer and one local secretary. Instead of working with so called junior experts from Germany who had been undergraduate students without any working and teaching experience, the GTZ- team leaders could have contacted senior experts with more profound experience in product design and who would have been able to teach the locals. Besides the “old” problem of quality, a profound analysis for new products and the research and exchange of ideas on products, designs and the international markets were missing in the DTC concept: some more training and study to help the SMEs in becoming competitive in the export market would have been necessary.

5. The Motherhouse Concept

A successful way for any cooperation with least developed countries seems to be that of Eriko Yamaguchi. In 2006 Yamaguchi founded Motherhouse, “a company that aims to establish the brand of developing countries by making high-quality products in developing countries with the design, production process and the quality control of developed countries” (Yamaguchi, 2008[iv]). This idea does resembles the idea of DTC but the approach and the modalities of realization are different:

Driven by her own difficult childhood Yamaguchi is highly dedicated to this project because she wants her dream come true: giving the “poor pride and hope” (Yamaguchi, 2008). The name “Motherhouse” is already a composition of two strong symbols: Mother stands for “Mother Teresa”, “-house” comes from “house for street children”.

To analyse the living conditions of Bangladeshis and the implemetation of development cooperation concepts Yamaguchi moved to Bangaldesh, learnt Bengal and completed a Masters in Development Studies as first foreign student ever in Bangladesh at BRAC University. Instead of donations and foreign aid that may not help the target group because of the high corruption in LLDCs, Yamaguchi relies on the power of the free market economy. She believes that products with a good design and good quality combined with her own story will be so attractive to Western consumers that these products will be sold easily.

In her research for a sustainable idea to help she up with bags made out of jute fiber and leather that look like the bags of the fashion brand Marco Polo. As jute fiber is produced in Bangaldesh and has a positive environmental track record, it fits in her idea of social and enviromental responsibility. She started to design bags, produced a first collection of 4 different models and 160 pieces under difficult conditions and shipped them to Japan. As Yamaguchi was not a sales person, she despaired at the Japanese ditribution system which was not interested in her articles. Because of the low interest Yamaguchi started to sell her own story. She wrote a book about her life and her busisness of Motherhouse, named “The Naked life. I am always on

my own” and opened a flagship store in Tokio one year later. In addition she started a media campaign. Articles appeared in “ELLE” and other life style and business magazines like “Ecoloco” and “Business week” in Japan and abroad. She won a prize as women entrepreneur. As the interest in her, her company and finally her bags rose, so did the demand in her products. Although high quality production is very difficult in Bangaldesh and despite two failures concerning producing fabric and corruption by her own employees in the contracted factories, Yamaguchi did not stop her high level commitment in the country. Actually she is building her own factory. In the near future she plans to build a school and kindergarden to provide mothers work and chilrdren eductaion. Currently Motherhouse has three different collections of bags, made out of high level jute fiber and leather and a small collection of wooden goods which reflect the needs and demands of her Western and Japanes customers e.g. an i-pod-Stand which looks like a mini-deck chair and which is made in Bangladesh. In Japan there are three flagships stores.

Motherhouse is successful in the number of sales, but still there are a lot of problems especially in market research, design and in brand strategie. Presently the design is made by Yamaguchi herself, more or less copies typical bag designs but as she is interested getting design from Bangaldeshis she needs to address the lack of education. Therefore she has started to cooperate with DTC to implement design and find ways how designers could be trained. Because of the strong relation to DTC, the contact to Germany is very intense, and Motherhouse hopes to use this relation to establish a stronger presence in Western Europe: Yamaguchi and the CEO of DTC Atif Rashid regulary attend international tradeshows in Europe, like Ambiente oder “Tendence and Style”, to learn more about the new designs for the next saison.

6. Conclusion

These examples illustrate three different approaches and provide a historical view of development cooperation as it relates to design and product creation. Global media and communications play a major role in the potential and limits of the different strategies. Approaches like that of Aarong show that developing countries are capable of creating sustainable ventures that can simultaneously meet the larger goals of poverty alleviation and empowerment. However, these "traditional" strategies can be limited in their success in world markets, where consumers demand different quality and designs. Aarong understands its local markets and production very well but only sells in the fair trade markets. Within the globalized world, this is akin to providing developing countries with access to niche markets. DTC's approach of educating designers reflects the new development paradigm of empowerment and growth from within. Combining Western design with Bandladeshi creativity could have created entirely new designs and markets. Yet, as the Motherhouse approach illustrates the world markets are stubborn in their demands, and more communication and contact with the Western media may be critical to success. Motherhouse succeeds because of its intimate understanding of local production capabilities and personal investment of its founder. Similar to development initiatives from private philanthropy such as the Gates Foundation, Motherhouse's mission is narrowly focused in its goals and intervention. Importantly, for Motherhouse media and communications are critical and serve as more than a source of information. Through its media campaigns and targeting of design trends, it almost shapes the opinion about its products. As global media becomes ever more important, understanding and shaping consumer preferences and steering local production accordingly appears to be critical to success to create change in developing countries.

In addition global media also shapes local preferences, making an understanding of its impacts on consumers in developing countries critical to success in the home market. As the purchasing power increases, consumers will increasingly demand differentiated products that meets their aspirations which in turn are influenced by images and trends in industrialized countries. Yet this information does not directly translates into preferences but is mediated by

national culture and identity. Just as development is no longer about creating opportunities to export, design also needs to target the local market.

7. Vision

"Going shopping helps to make the world better." This slogan describes Lohas, an acronym for Lifestyles of Health and Sustainibility. Lohas is a particular market segment and relates to "green" ecological initiatives. Generally composed of a relatively upscale and well-educated population segment Lohas consumers are "interested in products covering a range of market sectors and sub-sectors, including: Green building supplies, socially responsible investing and "green stocks", alternative healthcare, organic clothing and food, personal development media, yoga and other fitness products, eco-tourism and more." (LOHAS, 2008[v]). The LOHAS Market, was found in 2000 when globalization has started change the world. Due to media consumers get an idea of the consequences of their shopping attitudes but contrary to the fair trade trend, Lohas consumers want to enjoy their messages: Lohas goods have to be sexy, useful and representable. Business, media and entertainment can educate, shape and influence consumer behavior and purchasing decisions while promoting lifestyles of health and sustainability. Development projects which deal with design could profite of LOHAS and their market power. They could bring companies, the entertainment industry, as well as celebrities together to gain a greater sustainable output. Instead of collecting money or raising awarenes or "pity design" of developed countries, LOHAS could show the creative potential of the countries. The successful recipe for design in context of development cooperation seems to be to adapt each of the products made in LLDCs here in Europe, in order to enhance the appeal of these items for people in LLDCs. Consumers' attitudes towards product labels cold be used in combination with development cooperation in the areas of health and wellness products, sustainable business and social consciousness. The international community — the donor community — still needs to sustain and increase the volume of official development assistance in order to create seek strong partnership. Design could act as mediator to create, beside cultural differences, a common language and understanding. Therefore communication needs to be interactive: Developed countries should learn more about life apart of poorness in undeveloped countries, and the other way round, people in LLDC should get to know that Western tastes. The aim should be to build a network of organizations, designers and media and celebrities to enhance partnerships and development.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Sustainable Use

Changing consumer behaviour through product design

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Abstract

The paper presents the results of research investigating how design can be used to change consumer use behaviour. It analyses selected behaviour models from social-psychological theories and highlights the barriers to sustainable consumption. A model is developed to illustrate the factors stimulating changes in behaviour and design intervention strategies are higlighted and their application within Design for Behavioural Change discussed. Two case studies, one examining social impacts of mobile phones and the other environmental imapcts of household fridges are outlined. These are used to illustrate how Design for Behavioural Change could be applied to enable users to adopt more sustianable patterns of use. Conclusions are drawn on the appropriateness of these strategies and the potential for designers to change use behaviour.

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1. Introduction

Designers shape the development of products and services which directly impact upon society and the environment. The application of sustainable design can greatly reduce the environmental and social impacts of these products and services. However, many impacts such as energy consumption during the use of electronic products are mainly determined by the consumer's behaviour. Government and NGO measures through a range of information campaigns have been ineffective in creating the long term behavioural shift needed to reduce the impact of product use. Users have to make the link between the information, their own behaviour and the environmental and social impact and this makes it difficult to motivate a change in the majority of user's behaviour.

By considering the use phase of products designers have great potential to decrease environmental and social impacts, however, this stage of the lifecycle is often not considered in detail. Designers are in a position to plan and shape the way in which consumption occurs as well as to bridge the considerable intention - behaviour gap between values and everyday user actions (Sustainable Consumption Roundtable, 2006). To date few attempts have been made to change consumption behaviour through product-led interventions to limit environmental and social impacts.

Consumption is not only purchasing, but developing routines and rituals of use and modifying the product concretely or symbolically. According to Koskijoki (1997), consumption involves the selection, purchase, use, maintenance, repair, disposal and recycling of any product or service, as opposed to their design, production and marketing. Multi sociological and psychological motivators behind the consumption behaviour impel people to consume insatiable quantities of products and services. Environmental and social benefits of the wider global community, compared with the desires of the individual are not strong enough to motivate a different lifestyle. On the other hand, the manner of consumer interaction with the product has large impacts. (Environmental Change Unit, 1997; Sherwin and Bhamra, 1998; Lilley, Lofthouse and Bhamra, 2005). Products, as the interface between consumers and consumption activities, can give immediate and direct responses to users' operations: how it is perceived, learned, and used. Designing a product means designing a user experience with the product, which also determines the compound impacts of this experience. A better understanding of what users do with, and how they interact with products as well as the hidden factors behind the daily decision-making process should be gained in order to develop a valid critique of environmentally and socially significant consumption.

This paper begins by analyzing some selected behaviour models in social-psychological theories. Then by highlighting strategies to facilitate design for behavioural change, the breakthrough points that potentially enable design to influence the consumer behaviour and habits are identified. Two case studies are outlined one focusing on changing social impacts of mobile phones and the other reducing environmental impacts of household fridges and freezers. Finally the paper discusses the potential for Design for Behavioral Change to be applied within design.

2. Consumption Behaviour and Habits

Focusing on individual behaviour, a number of existing theories try to answer the question: what factors contribute to behavioural change. The theory of planned behaviour (Ajzen, 2006) illustrates attitudes, the subjective norm together with perceived behavioural control as explanatory factors of human behaviour. Triandis (1977) proposed an integrated model of interpersonal behaviour which not only includes social factors and emotions in forming intentions

but also highlights the importance of habits as mediated factor of behavioural change. When the behaviour is “highly automated”, performed with a minimum of deliberation or little cognitive effort and often only limited awareness (Jackson, 2005), it becomes habitual. Meanwhile, attitudes, norms and perceived behavioural control become less able to predict future behaviour and people take less notice of contextual information (Verplanken & Wood, 2006). As Verplanken and Aarts (1999 in: Verplanken & Wood, 2006) defined, “habits are learned sequences of acts that have become automatic responses to specific cues, and are functional in obtaining certain goals or end-states”.

To encourage consumers to break old habits, two factors are suggested: repetition and reinforcement (Jager, 2003 in: Jackson, 2005). Andersen (1982) identifies three stages in the formation of a new habit - the declarative stage, the knowledge compilation stage and final procedural stage. It has been argued that the cognitive script for a habit to develop should be easy to follow and enable repeat the same action in similar, provided with the regular reinforcing reward as consequences of a new behaviour (Sustainable Consumption Roundtable 2006).

2.1 Habits

It has been recognised that although consumers express strong concern about the environmental and social impacts of their activities, their actions do not reflect their concerns. In reality, the practices ingrained in our life patterns are carried out without conscious deliberation (Jackson, 2005). As the studies of Verplanken and Wood (2006) showed, “approximately 45% of respondents’ everyday actions were habits in the sense that they were performed almost daily and usually in the same location”. Much of the literature (Jackson, 2005) argues that inconspicuous consumption has a significant environmental impact in terms of energy and resource consumption. It is argued that what users do with, and how they use products is important (Jackson, 2005). Habitual and routine behaviour contributes to the awareness - intention - behaviour gap between environmental and social values and everyday interaction with products.

3. Design for Behavioural Change (DfBC) Approaches

Prior research by the authors indicates that there is no one way to design for behavioural change and no hard and fast rules as to which approach to use (Lilley, Bhamra and Lofthouse, 2006). The authors’ investigations have identified seven strategies which can be applied within design, Table 1 illustrates these with examples of where they have been applied.

Table 1. Design Intervention strategies and Examples

Eco-Information – design oriented education	
to make consumables visible, understandable and accessible to inspire consumers to reflect upon their use of resources	
1 - Visualizing energy-Expressing the presence and consumption of energy	Examples-Power Aware Cord - Seeing Personal Energy Consumption (Interactive Institute, 2004)
2 - Experiencing energy - Design for interacting with energy	Examples-Tyranny of the Plug Kitchen Machines - Being involved for powering the product (Van Hoff 2003).
Eco-Choice – design oriented empowerment	
to encourage consumers to think about their use behaviour and to take responsibility of theirs actions through providing consumers with options	
Users have a choice and the product enables sustainable use to take place	Examples- Domestic Energy Display - household system level concept (Design Council 2005).
Eco-feedback – design oriented links to environmentally or socially responsible action	
to inform users clearly about what they are doing and to facilitate consumers to make environmentally and socially responsible decisions through offering real-time feedback	
Providing tangible aural, visual, or tactile signs as reminders to inform the situation	Examples- Eco-Kitchen (Sherwin, Bhamra and Evans, 2000)
Eco- spur – design oriented rewarding incentive and penalty	
to inspire users to explore more sustainable usage through providing rewordings to “prompt” good behaviour or penalties to “punish” unsustainable usage	
Design showing the consequences of actions to consumers through “rewarding incentives” and “penalties”	Examples- Flower Lamp - Rewarding Energy Behaviours (Interactive Institute, 2004)
Eco-steer – design oriented affordances and constraints	
to facilitate users to adopt more environmentally or socially desirable use habits through the prescriptions and/or constraints of use embedded in the product design.	
Designing “ease doing” affordances and constraints for adopting the instinctive sustainable use habits or reforming existing unsustainable habits	Examples- Unilever Powder Tablet - Counteracting excessive amounts of consumables consumption
Eco-technical intervention – design oriented technical intervention	
to restrain existing use habits and to persuade or control user behaviour automatically by design combined with advanced technology	
Product design combined with advanced science and technology for environmentally or socially responsible behaviour includes using new materials; renewable energy resource; and new technology such as advanced computing.	Examples- Energy Curtain - Interacting with Daily Light Cycles (Interactive Institute, 2004).
Clever design	
to automatically act environmentally or socially without raising awareness or changing user behaviour purely through innovative product design	
Purely design solution for decreasing environmental impacts without changing any user behaviour	Examples- Integration of toilet and washbasin.

These design intervention strategies whilst providing interesting considerations for designers have not been widely applied and there is lack of real data on the effectiveness in both theoretical and practical dimensions. It was for this reason that empirical research was conducted to understand further Design for Behavioural Change.

3.1 Linking the behaviour/habit model and design intervention strategies

As highlighted above intention, habits and controls are considered important to immediate and mediate antecedents of behavioural change. Due to the complexity of motivations for shifting behaviour, different levels of interventions need to be designed accordingly to ensure behavioural and habitual change. The understanding of the behaviour disintegration and formation and relationship between antecedents of change in behaviour/habit and different levels of design intervention is presented in Figure 1 below.

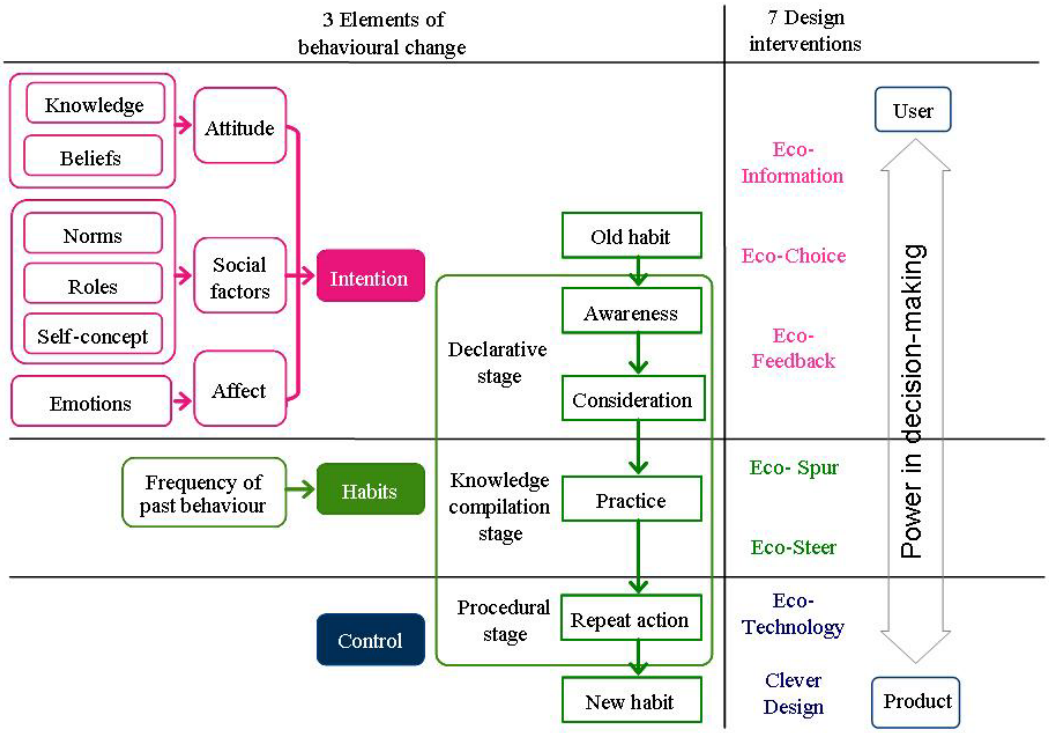

Fig. 1: Linking antecedents of behavioural and habitual change with varying levels of design intervention strategies

As demonstrated, design interventions are classified by the degree of power for decision making between the user and product. It is important to develop a balanced and ethical approach: weighing up the determinates of behavioural and habitual change and designing the sustainable products to bridge this gap

4. Case Study 1: Household Fridge and Freezer

There are very few pieces of equipment in the home that use energy 24 hours a day 365 days a year. Fridges and freezers are two such products and account for around one-fifth of domestic energy consumption (Energy Saving Trust, 2006). User-centred research techniques were used to capture opportunities for design to solve environmental problems of use behaviour and activities around the fridge and freezer relevant to energy and food consumption. Product-in-Use observations were carried out with aid of audio-visual equipment.

A series of user studies were developed to identify the most suitable design intervention strategies to be applied in the design of fridges and freezers. The studies aimed to collect information about the “actual” and “assumed” needs, the diversity in use context, the unsustainable and sustainable use patterns and the hidden factors behind the usage. A questionnaire and semi-structured interview were used to investigate what consumers thought about their fridge and freezer and the environmental impacts of their use. The use activities around the fridge and freezer were arranged into three related groups including condition and environment of product in use, food shopping unpacking and food preparation. Correspondingly, three observations of Product-in-Use were conducted.

4.1 Observation Studies

In the first study, the subjects were asked to fill out a kitchen user profile questionnaire and told that the study aimed to understand the relationship between the user and their kitchen. This cover story was used to avoid the unnatural desirable response tendencies (Verplanken & Faes, 1999). Two observations were then carried out to record food shopping unpacking and food preparation. Finally, a semi-structured interview and post intervention questionnaire provided a chance for participants to explain their behaviour in the observation sections. Three fridge and freezer users were involved in the first study and were aged between 21 and 40 and had owned their fridge or freezer for between 6 months and 6 years.

The second study added 24-hour recording to the observation section and a range of questions about the factors influencing decision making and behavioural change to the post-intervention questionnaire. Three families took part in the second study which recorded their fridge and freezer use in a “normal” week day over 24 hours. The participants were in the age group of 35-50 and had owned their fridge or freezer for between 1 year and 9 years.

The two studies were designed to test the effectiveness of the approaches which aimed to gain an insight into their actual use behaviours and habits, their problems and difficulties in operating the product, “actual” and “assumed” needs as well as look for opportunities for product design solution to bridging the gap between the intentioned use of a product and actual use patterns in order to reduce the environmental consequences.

4.1.1 Changing user behaviour through design

The data collected from the observation studies provides interesting evidence to support the theory that an understanding of real use behaviour is an essential starting point for improving product design for behavioural change to reduce environment impacts.

In the observation of unpacking grocery shopping, it was seen that most of the time spent putting food into the fridge and freezer was used for making room for new items and transferring items between shelves. In the 24 hour recording, it took more time to take desired items out, looking for the desired item inside the fridge i.e. at the back or bottom. However, this previous experience and knowledge saved time when returning to the fridge. Understanding what is an

operational principle of the consumer could help to reduce door opening time. The results of observations showed that consumers located items according to a range of principles including:

- Expired date of food: all subjects put newly purchased items at the back of the fridge and old or used food in an obvious place in the fridge such as in the front of shelf at eye-height level or in the top door bin;
- Food packaging: sealed and packed foods and drinks such as strawberries, ready meals, beers, are stuffed on the shelves and often overlap one another; meat often went to the bottom glass shelf because the packaging may be broken and “it will not drip on everything“(User-03);
- Weight of the items: “heavy” things, such as potatoes and carrots often were kept in the bottom of the drawer underneath the soft vegetables and fruit such as tomatoes and grapes;
- Temperature distribution in the fridge: consumers used the different temperatures inside the fridge to decide where to locate raw meat, cooked meat and cheese, this was usually at the back of the fridge, however this lower temperature often froze vegetables;
- Door bins: bottom always kept wine and milk and mid bin often small jars and bottles, and juice; items in top door bin varied and included cut onion, garlic, cheese;

These points in routine fridge and freezer use patterns can be used to develop more acceptable product-led solution to improving the loading efficiency. A more adaptable interior, for example, would enable consumers to create the optimum arrangement of their food and drinks in the fridge and freezer. Additionally, according to the type and shape of the food or food packaging, more behaviour constraints and affordances (Tang & Bhamra, 2008) can be designed to lock the location of the food. What is more, designing to display the contents better would reduce the opening time for seeking items inside the fridge or even seeing the foods without opening the door.

Providing consumers with options through product and system or service design could encourage them to think about their use behaviour and take responsibility for their actions. This may be achieved by designing a flexible modular system with separate temperature settings, and supplying a modular service with the customer to meet their needs during their different life stages. This could avoid unnecessary replacement and usage of a second cold appliance.

The findings also pointed to some potential opportunities for improving product design from an environmental perspective. To reduce door opening times, designers could create internal structures for organising food preparation and special milk and butter/margarine storage solutions for making quick meals and drinks, as in the case of through-the-door ice dispenser. What is more, in the user study, food hidden at the back of the shelf was one of the contributors to needless food purchase and food wastage. Using shallow drawers or software to keep a food shopping record can provide consumers with a clear view of the food inside the fridge and freezer decreasing food waste and the amount of time with the door open.

4.1.2 Guiding and maintaining changes in intention and habits

By analysing the interviews, the barriers that may prevent energy-conscious practices taking place are summarized below;

- Invisible energy: consumers were not aware of the amount of individual electronic equipment use.

- Unawareness of the link: in ordinary people's opinions, the way of using fridge had little effect on overall energy use in the home;
- Lack of Information: consumers felt that fridges and freezers are an essential part of modern life and it was more important to set lower temperature to ensure the quality and taste of the food and drinks than to be concerend with the energy use.
- Lack of concern: Product-in-Use observation showed that all young family members left the door open while transferring items;
- Lock in lifestyle: participants assume that the product is efficient enough by itself and there is no need for a conscious behaviour to improve the overall energy performance.

To address these, design-led interventions would need to build on energy conversation to guide a behavioural change. Designing an effective way of communicating makes sure consumers know how to use the product efficiently through a range of design interventions such as providing information, choice, feedback or behaviour spur (Tang & Bhamra, 2008).

4.1.3 Changing user behaviour through sustainable system design

Modern kitchens were identified by participants to be the main restriction of consumption behaviour with regard to fridges and freezers. It not only required a second, often empty counter fridge and freezer to fit in but also it was responsible for half of cold appliances in the study were built-in style fridges and freezers and one third were located next to the oven. What is more, limited storage space in the kitchen is another reason for refrigerating some items that do not need to be. Therefore, designing a food storage system in the kitchen could provide design-led solutions to facilitate sustainable energy and food consumption behaviour.

4.2 Reflections

To successfully integrate behavioural concerns into design practice, and to make this process repeatable, appropriate information and tools must be developed and incorporated into the design process. The findings of this design study have provided an insight into the type of information required by designers to consider these issues and appropriate formats for conveying this information. In addition a range of dsign intervention startegies will need to be adopted in the next stage of the work which is to develop concepts and prototype fridges to reduce the energy consumption in use.

5. Case Study 2: Mobile Phones

A design study was devised for Industrial Design Masters students at Loughborough University whereby the students were set the challenge of identifying and addressing a social issue resulting from the use of mobile phones in public spaces using a design intervention strategy for behavioural change. The main aim of this study was to observe the designers response to social issues identified and to record their research and design processes.

A design brief was generated, comprising of three elements; research & development, redesign and presentation of final concept. The students were given a preparatory lecture to introduce three of the design intervention strategies discussed above and a selection of design case studies which emerged from the literature. The first stage required each student to carry out user-centred research in order to identify social issues resulting from the use of mobile phones in

public. In the redesign stage the students were asked to select one design-intervention strategy and apply it within their design process.

5.1 Results of Design Study

Analysis of the students' logbooks and presentations revealed that most combined primary research (product analysis, interviews with users and observational studies) with secondary literature reviews. The secondary literature focused predominately on the social impacts of mobile phone use, few students actively sought out additional product design case studies as inspiration for their own concepts. Points of analysis included; body language, type of function carried out (e.g. texting, listening to voicemail), the location of the user in relation to others, the characteristics of the user (e.g. proficiency, age etc) and other people's response to behaviour displayed. Some students captured user behaviour using sequential photographs which were particularly useful in illustrating the series of actions taken by the subjects observed.

5.1.1 Application of Design Intervention Strategies for Behavioural Change

Some of the students found it difficult to distinguish one approach from another. The use of case study examples to explain each approach helped in some way to clarify their meaning and how they could be applied; *"The examples such as [the] Kambrook 'Axis' Kettle explain these concepts very clearly"* (Student 3). Most found eco-feedback easy to understand, but found eco steer hard to define. To some, the boundary between eco steer and eco technology was undefined and this made distinguishing one from the other quite difficult technology.

In terms of applying these approaches, most of the students advocated a 'mixed' approach, combining two or more approaches. Few students used the approaches as a starting point, preferring instead to apply one or more approach as part of their idea generation process to provide "a direction to think about the problems" (Student 5); as inspiration for concepts; or as a means to develop design ideas. "They are not only the lamps to my feet during the idea generation but they are helpful to understand what kind of solution can effect what kind of user behaviour during design development" (Student 3).

5.1.2 Perceived effectiveness of design intervention strategies

Eco-feedback would, some felt, not be as effective in changing ingrained anti-social behaviours. Eco technology products were seen as having greater potential for effecting change. However, some students felt that the balance of control may be weighted more heavily on the side of the product therefore users may feel controlled or restricted. It was felt that the consumers should be given the choice to behave in the 'right' way, only if they failed to do so should the product take action to prevent their behaviour. The students concluded that preventing choices straight away would annoy the customer and possibly cause a reduction in sales. Interestingly, only one student sought to analyse of the downstream effects which may arise through the use of his redesigned mobile phone.

5.3 Design Outcomes

Analysis of all ideas generated in sketch form and those detailed as final solutions revealed a range of approaches to solving the various social issues identified, however some commonalities could be observed in the type of solution proposed.

- Constraining or affording actions through the product form. Student 1 observed users' lack of concentration when using their mobile phone in public places and the resulting neglect of 'real conversations' to prioritise virtual ones. As a result a concept was developed whereby the mobile phone creates a physical sensation to provoke a response from the user. A loop sporadically tightens around the users thumb to remind them of where they are and to ground them in the 'real world', thereby attempting to address the problems caused by user's lack of attention when engaged in virtual interactions. Student 2 used his observational studies as inspiration for one of his design concepts, having observed some discreet users cupping their hands around the mouthpiece of the handset to mask the noise of their voice, he designed a mobile phone featuring four pressure points. These points must all be continuously depressed by the user to maintain the connection. The location of the four pressure points deliberately encourages the user to adopt a specific arrangement using both hands to shield the phone and conceal their mouth.
- Constraining or affording actions through the product function. Some of the design concepts featured limited functions represented as quick keys or shortcuts to enable rapid access. Student 3 designed 'fast keys' which are displayed in a simple keypad to enable fast and efficient use of basic functions such as listening to voicemail and sending texts. One of the 'fast keys' enables the mobile phone to respond to incoming messages or calls with a pre-prepared text message if it is in silent mode. This function also enables the user to press the button to indicate that they are busy.
- Eco-feedback strategies.Several design concepts which attempted to educate the user or influence their decision-making process through the provision of information were identified. The type of information provided typically included; the 'called's' status, location, and proximity to others. In many cases this was realised through the introduction of a supportive technology e.g. Bluetooth or a Global Positioning System (GPS). The information provided was, in many design concepts, depicted as a scale or symbols which illustrated the level of appropriateness or suitability of the call according to the environment. In most cases an over-ride facility was included for emergency situations. The student's concepts mostly focused on developing a user interface to provide information based on an assumption of technological capability, MIT's work is concerned with establishing a viable technological system to enable this process to operate.
- Supporting devices and systems. Some students chose to introduce supplementary devices and/or locate the product within a system which controls user behaviour. These systems typically consisted of a series of networked devices located in a public place which detect all mobile phones in a designated area. These devices send a signal to all active mobile phones to either; notify the user of appropriate conduct, switch the use profile of all mobiles automatically or disable function immediately.
- Wearable devices. Wearable devices were designed to address problems arising from incessant ringing of mobile phones left by their owners; situations in which users neglect to turn the phone off in public places; or instances where the ring tone is set too loud. The rationale described by some students who had devised wearable mobile phones was that by wearing the device the user's ability to hear the phone ringing would be increased and this would hasten their response reducing annoyance to others. It was also felt that wearable devices would allow the silent vibration mode to be used more effectively as an alert mechanism. Student 3 designed a mobile phone which the user wears on their wrist. The screen interface and keypad pivot on a fixed base attached to the wrist strap.

– Emotional response. One student developed a series of sketches exploring the potential for the mobile phone to produce an emotional or physical response to actions taken by the user. The first is a concept for a mobile which would automatically slide shut should the user's voice or the duration of the call exceed an acceptable level, terminating the offensive conversation for a predetermined length of time. Development of this concept led to the inclusion of an indicator to show the user the length of time left until the phone became operational. Another concept contains spikes which protrude when activated by an excessively loud speaking voice this is a particularly aggressive tactic on the part of the mobile phone.

5.3.1 Caller Hegemony Concept

Student 1 took the concept of caller hegemony as his starting point. Caller hegemony explores the dominance of the Caller over the Called. Having recognised the current imbalance of power between the Caller and the Called, this student sought to generate a solution to inform and guide the Caller and Called as to appropriate action to be taken in different social and environmental contexts.

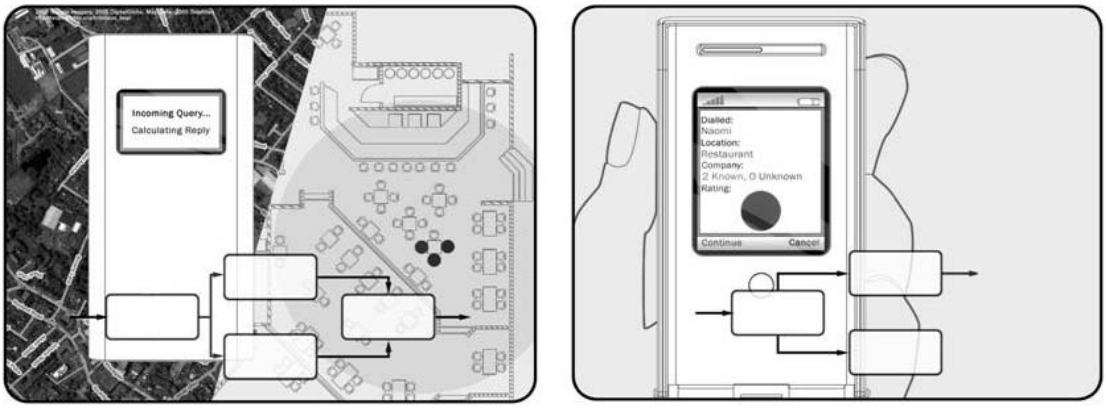

Fig. 2: An Intelligent mobile that can advise the user

This concept is based on a combination of two design intervention strategies; ecofeedback and eco technology. When placing a call, the Callers mobile phone uses Bluetooth and GPS technology to inform the Caller as to the Called's current location, proximity to other users and volume of company, figure 10. The Caller can then make an informed decision to continue the call, or call back. Should the Caller wish to continue the call, the Called's phone then vibrates or rings based upon information provided.

As a secondary layer of complexity the mobile phone makes a decision as to the appropriateness of the call based on its context of use. Should the Caller or the Called continue the call despite information provided to indicate the call is inadvisable; both handsets display their embarrassment at being made to behave in an inappropriate way. As part of his design development the student explored the ways in which the mobile phone could indicate its emotional state. These ranged from highly disruptive e.g. deleting content, delaying downloads in progress, or terminating the call to slightly less confrontational ideas e.g. shaking, stammering or vibrating. In the final design the phone displays its embarrassment by emitting a red light which disables functionality for a fixed period enabling the phone to calm down.

Student 1 acknowledged potential downstream social effects which could be caused through misuse of the product;

- The phone could be used to keep track of where people are and who they are with. Parents, for example, could check if their child is at school and companies could monitor the movement of employees.
- Those who wish their activities to remain a secret from others may purchase mobiles which are not Bluetooth enabled to allow them to hide their location from others.
- Finally, it may be possible for someone to purposefully disable another user's phone by deliberately raising their voice to trigger a shutdown.

5.4 Reflection

The student's debate concerning the moral and ethical issues inherent in designing for behavioural change reflects those of the authors' (Lilley et al, 2005). Concerns were raised regarding the level of control or influence which designers should ethically integrate into the product design. This debate was coupled with discussion relating to the effectiveness of design intervention strategies in changing user behaviour.

Eco-feedback was understood by most students and was arguably the easiest approach to apply within product design. However, the students questioned its effectiveness in changing ingrained user behaviours due to the potential for the user to ignore the feedback provided. Eco-feedback approaches provide users with information to enable them to change their behaviour, however, information does not necessarily lead to action as the consumer must be able to link their behaviour with the long and short terms consequences. Eco steer was the least understood approach, yet this may be due in some respects to the lack of tangible examples of how this approach could be applied within product design. Eco technology products were seen as having the greatest potential for effecting change. However, some students felt that if the product continuously regulated behaviour it would not encourage people to learn from their 'mistakes' and could result in the user feeling controlled or restricted by the product. Most students appeared to favour a combined approach which is a particularly interesting development especially as the brief originally stipulated that only one approach be used.

6 Conclusions

The findings of these studies has indicated that designers need to be made aware of potential problems caused by user behaviour through introducing the concept of designing for behavioural change as a design challenge.

The fridge and freezer use behaviour study highlight that understanding consumer behaviour can be the preliminary step for seeking solutions to minimizing environmental impacts of household consumption through improving product design. The observation studies not only uncovered the way in which the product is used and its unnecessary energy and food consumption, but also the gap between environmental awareness and real action, and the reasons for such a gap. Firstly, the results show there is a lack of consumer awareness of the link between their personal behaviour and the direct impact on the environment and energy use. In addition, the routine practice and habitual activities ingrained in our use patterns of energy-consuming products are performed automatically with little deliberation. What is more, the interaction of the consumer with the fridge and freezer exposes cultural and social values that shape consumption behaviour.

These observational studies pave the way for the future research. A series of main user studies is underway to detect what influences people's behaviour to reduce the impact of consumption. Furthermore, future work will investigate further how to design to shape the user

interaction with the product, as well aiming to bridge the considerable intention - behaviour gap between environmental values and consumer everyday action. The findings will be applied in design to illustrate how consumer behaviour can be improved through Design for behavoural change.

In terms of the effectiveness of the dsign intervention strateges in aiding the design process, it is interesting to note that rather than using these as a prescriptive method or tool, the design students viewed them as inspiration for concepts or as a means to develop or evaluate the effectiveness of design ideas. It has, therefore become clear that any outcome of this research should focus on providing potential directions or approaches, rather than prescriptive methodologies to follow.

Overall this paper has shown that design intervention strategies are useful and inspirational tools enabling designers to begin to address issues of use behaviour. Designing for behavioural change is, however, still a relatively underdeveloped research area and further work needs to be carried out with a wide range of different product types. Finally, 'behaviour changing' product ideas will be prototyped and tested with users to evaluate their effectiveness.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Systems Design Approach

interdisciplinary/systemic innovation

Luigi Bistagnino[1]

Abstract

Over the 30/40 years design efforts have been mainly devoted to the conception of new products and the use of raw materials, energy and production waste disposal, have been relegated to the mere technical sphere. But today's environmental issues should no more be regarded as extrinsic topics to the design process because they are integrating parts of a more complex system-product.

Henceforth more attention has to be devoted to outputs/inputs related to this kind of system.

If the outputs will be looked at as a resource (useful economic value for other production systems), they should be used as active parts of the entire industrial process in order to generate the future design innovation inspired to current Nature's working dynamics.

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1. Preliminary considerations

All the choices made every day are inevitably influenced, spontaneously and subtly, by the consumerist habitus, so much so that we do not even realise we have become victimised. Environmental awareness, despite being widespread, proves to be useless when facing attitudes that have now become deep-rooted in our daily life and that end up denying this feeling of environmental friendliness. As a consequence it becomes difficult to assess the outcomes generated by this behaviour, in that shared culture is not conducive to a habitual consideration of daily choices, generating flows of matter and energy and involving the other components of our social and economic system. Goods and products are light heartedly purchased or thrown away, often with the mere purpose of making a statement of our own existence and of finding relief from temporary depression.

Also on a planning level, we show a lack of consciousness and awareness and our work is not carried out with the intention to pursue this goal, often blaming other people's weak environmental education and bad behaviour for the occurrence of the current ecological problems.

Considering that we measure the importance of life by the value and the qualities of what we own, it is inevitable that "having" becomes the heart of the values displayed in our cultural, social and economic systems, prioritising possession and looking at the product as a pivotal element upon which all considerations are made.

If we wish to undertake a new experiential journey aiming at building a different cultural and ethical system, it goes without saying that we need to see how limited this vision is, using this observation as a springboard for new angles of observation where deeper values, naturally and intrinsically linked to being are put at the centre of our thoughts.

This unusual but spontaneous outlook makes the ordinary and intimate relationships we establish in our life context, the focus of our attention and reflection, leading to a renewed real and cultural humanism.

Every time we need to design an object, we act thinking about the product to be realised, as well as the research we carry out in the pre-planning stage, trying to identify what we have to do to meet the consumer's requirements and what they will expect from it.

If we look at the product as the "main focus" of a project, we can see how a number of values intrinsically related to it, are subsequently and immediately singled out and concretised such as raw materials and economic value.

These influences, endowed with incredible strengths, reside in the fact that they make a symbolic function concrete.

Owing a product that enables us to feel part of a clan, or a social class, is particularly appealing to customers, in that a status symbol makes a precise statement of our place within the society, and gives us confidence.

Most of the times consumers end up buying the concept of the brand of that particular product. As a result possession fulfils an induced need, not a real one.

We buy mainly to assert our status, regardless of the function of our purchased object.

If in the post-war period the main need was to rebuild the social values, the boom of the 60s focused on unnecessary things. A must-do-thing, nowadays, is to have something our neighbour does not have yet, almost as if owing something special would make us special and unique too.

Only later on, when we actually use the object, do we realise what it was actually devised for, and when it wears off the user will realise it is not only made of a shell, but also of other elements that make it work, those being its parts.

Each object is considered as a whole, as a monobloc deprived of its constituent parts. Spectacles, a telephone, a car, are objects that are experienced and enjoyed for what they represent and for what they give, without realising, until they break down, that they are "boxes" enclosing a far more complex world.

It is not until they stop functioning and need to be thrown away, that we have the real perception of their life cycle.

The European legislation is focusing on the end-of-life cycle of the product, on disassembling and recycling. This partial approach aims to solve a problem after it has occurred, rather than before.

A good starting point would be to improve product maintenance so as to extend its useful life. In any case, just because we have no real perception of the internal components, we do not worry of what actually makes the product work. As we are not directly "involved" in it, our main concern is not so much to make sure it continues to perform satisfactorily, but to preserve the status it symbolises. [2]

In general, also the perception of human life, of environmental sustainability and of our own world, manifest themselves in the occurrence of a crisis, when facing the unavoidable.

Environmental catastrophes, global warming, increasing desertification and deforestation, depletion of non-renewable resources, pollution and the ozone hole have been widely discussed topics. However we have always talked with our eyes fixed on the future. Only now we have started to make reference to the present because it is "now" that we are reaching the point of no return. We can all tangibly ascertain its consequences as now we have a real perception. We needed to hit against the real evidence, as we tend to pay little attention to warning for the future, we had to see concrete signs at the present, rather then thrusting into the future.

If, on the one hand, we know we are faced with a necessary change, on the other we do not know how.

The real evolutionary opportunity seems to reside in a turnover of the values that are currently rooted. Putting **being** and not **having** at the heart of our future actions, will result in greater focus on our dearest value, **life**.

The perception of this value is linked to the primary needs: it is not reached through external means, but only through the individual perception of needs related to the preservation of our own existence, which can be kept only by harmoniously confronting what is "around" us.

We need to be aware that we all differ one from another, as such difference arises from the uniqueness and difference of social, ethical and cultural contexts our lives are woven around, so as to act effectively and in a focussed way, without mixing the different types of users as if they belonged to a blurred and indistinct unicum, lacking peculiar willingness and characterised just by undifferentiated and nebulous needs.

Being able to produce for differentiated markets enables the creation of non-globalised and indistinct markets, presenting specific and contextualised features, preventing the positive outcomes of the recirculation of money (profits and investments) from resulting in disastrous imbalances, as we have been able to assess.

Creating new markets means producing right products that can be positively incorporated by the society they have been devised for. This implies creating new jobs and more widespread wealth.

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[2] Bistagnino, Luigi. 2008. *The outside shell seen from the inside. Design by Components within an integrated system.* Milano: CEA.

Investment profits are, in such a way, doubled, both from an economic and social point of view. This is why the product is, in this scenario, the last value to put at stake. Producing an object becomes a meaningless action if we do not make appropriate assessment of its real use for our existence, if we do not realise in advance that so many other values are far more important for human life.

Giving substantial emphasis to the values related to being, rather than having, will change our relational and evaluative priorities in a social context as well in the productive one.

As designers, we need to wonder whether we want to carry on "**planning** just **the product**" or if we'd rather "**plan for the man**", if we choose to prove our competences planning a form, or if we mean to use them to plan for the society; if we wish to express ourselves by means of an "hedonistic design" or if we opt for a "humanistic design".

Whatever our choice is and whatever decision we decide to take, jointly with the industry, we will need to have clearly in mind, from now on, what the positive or negative consequences of our action may be.

It is interesting to note that, also in an economic field, the belief that measuring the development of a society cannot be merely based upon economic parameters is spreading widely, but as a result of a deeper awareness of the need to adopt other thoroughly assessed values, in terms of quality and quantity, such as quality of life, of the environment, of education, of service, those being the markers showing the degree of prosperity, not so much from a material point of view but from the moral one of people (conference *"Beyond Gross Domestic Product. Beyond the Gross Domestic Product"* – established by the EEC and held in Brussels on 19 and 29 November 2007 – participants: Ashok Kosla co-president of the Club di Roma; Emeka Anyaoku of the WWF; Manuel Barroso President of the European Commission; Joaquin Almunia, Commissioner to Economy; Kristalina Georgieva, Director of World Bank).

Such a context calls for a deep change within industrial design practice. We will be required to face the responsibilities that we, as designers, have toward those who put the solution of real problems in our hands, as well as the realisation of wishes that have yet not been fulfilled, and the qualitative improvement of their lives.

Sustainability is not an individual property, but a shared value involving the whole community.

We are faced with a future where we will be able to plan and realise ecologically sustainable communities, built in a way that the technologies adopted and the political choices will not contrast with the system of the natural world.

We will be able to create naturally harmonious technologies that want to learn and exist in compliance with nature, rather than controlling it. Life or nature, in general, are not trade products, on the contrary they are an integral part of our existence. Therefore we need to be deeply aware of the designs and take them as models for our new future technologies.

2. Reasons for a change

Over the years design has been able to identify the outcropping needs of the society and to go along with the transformations, even anticipating new developmental fields. It has extended its boundaries getting more and more in touch with other sectors, offering more open viewpoints on problems, most of all making different types of know-how meet and interact aiming to discover new investigation contexts.

It has become an accredited point of reference for innovation development.

All this success geared at extending testing fields has generated new products, however it has relegated all the problems related to the use of raw materials, energy and production rejects disposal to a technical and technological area.

These issues need, on the contrary, to be an integral part of the planning process, so as to raise and develop awareness of production able to identify the correct types of resources and energy which have to be used in compliance with, rather than being an external factor of the process.

If up to now we have focused only on quantity and quality of raw materials and to their specific features, it will be equally important for our future to focus our attention toward not only on what can enter a system, but also to what can exit from it.

This insight results in the conception of a more developed project, interesting and complex, embracing the whole production chain, including all the problems regarding the production waste which are placed on the same level of supply and use of raw materials.

In the first place we will need to develop the output quality as well as the quantity, as they will be generating the real future uses. This means that different production situations may be correlated, so that the specific output qualities of a given production may turn into input for another process.

From this perspective, it is fundamental and unavoidable to elaborate a “multidisciplinary vision”, bringing together all the different kinds of scientific knowledge, hoping for the occurrence of an innovation inspired to the real dynamics and functioning of Nature.

The approach to the productive world will need to change, going from a “linear” type of action, to an advanced type of “interconnections”, drawing solutions from a truly interdisciplinary “new culture”.

Tests of this concept in an industrial field (see site <www.systemsdesign.polito.it>), have shown that the production activities may reflect the metabolism principles of nature, a reality which does not generate waste.

Design endorses this innovative approach of project of flow of matter and energy, investigating the positive transformation occurring in the production processes and becoming a systemic design.

It goes without saying that this renovated and fluid flowing of matter generates a new economic model which, enhancing the local resources, will give new life and revival to the territorial cultural and identification peculiarities.

Another important opportunity, arising from the outlined orientation, seems to be a change in the approach to the output of the production systems.

The existing legislation is based upon the fact that industrial process waste is something with little value, compared to the product, or that has been strongly polluted, so much so that manufacturers regard it as an issue to be solved as quickly and cheaply as possible. From this perspective it is easy to understand why the legislator wants to protect both the environment and the people, by means of obligatory regulations that aim to chart the course performed by substances regarded as hazardous.

Instead, if we turned the output of a problem into a resource, producing in such a way, an interesting economic value, we would consequently be interested in considering them as an active part of a process. As such we would try to enhance their intrinsic qualities and we would be inclined to change all the working processes that downgrade them. We would pay deeper attention to keep their appealing properties unchanged, in order not to lose their economic trading value, achieving at the same time a formidable result, that being a ZERO emission productive culture.

1. Systemic/interdisciplinary innovation

In our society we face situations, analyse cause-effect phenomena, solve technical problems, study strategies "per spot", using a linear approach. This is not innovation. We need to

attempt a change in the usual way we think. We will need to let our eyes, our intellect lead us in the most appropriate way if we wish to face the problem from different perspectives.

Innovation does not reside in the on-going technological update, but in the way we look at problems.

We feel it is time to activate an interdisciplinary culture, to create a network of know-how, to outline a dialogue between different interdisciplinary fields, one strictly connected to the other.

The knowledge to be spread does not exclusively refer to the process of putting up a product where the only aesthetic features is the enhanced one, but it is the awareness we are working within a system where special planning care needs to be devoted not only to the products but also to the system they relate to and where they have been generated, a system made of social, cultural and ethical values.

Guests sitting at a round table have to dine with traditional know-how and flavours, where local biodiversities are protected and natural cyclicality is respected, where information and education become food for thought.

By now, it is widespread knowledge that human beings' nourishment is closely connected to the **natural cycle** and of how modern industrialization has slashed these bonds, making food production timeless. Consumerist culture takes a leading role in the political and economic choices of a Country and affects the **value system** civil society has as a reference. On an industrial level, the logical linear process and development affect the perception of reality, as they are based merely upon cause-effect relationships, which generate huge quantities of waste, starting with the manufacturing process until the product "end of life".

With such an on-growing complexity as the one we are currently experiencing, it is necessary to withdraw from the exclusive focus given on the product and its life cycle, moving toward achieving greater competence in the context of the complex relationships which spring from the production process.

Planning only the product, although this also implies its coordination and integration of all factors (functional, symbolic, cultural, technical and productive) is an approach to surpass. We need to bring back within the total planning equation, the variable represented by those resources (generated as a result product or waste), that would otherwise be unused. We need to regain the cultural and practical skill to **outline and plan the flow of matter, running from one system to another, in an on-going metabolizing process which diminishes the ecological imprint and generates a remarkable economic flow.** Currently rejects generated during the manufacturing process, are only a cost.

Fig. 1: Output of a system, input to another one

This model draws heavily on the fundamentals of the Generative Science, based upon the assumption that, following any transformation of resource, all the sub products are conceived to obtain a generative added value, and a carefully studied object.

We are facing not only an environmental issue, but also a new economic model (bio-economy approach), which may also lead to new opportunity, if we please to look at the glass as half full, rather than half empty.

Fig. 2: Systemic Design approach

The approach of Systemic Design, a necessary cultural baggage conferred to the new operators, is likely to trigger a new economic model, based upon the planning of open industrial cycles.

It focuses on the Man, placed within the system where he lives and has his relationships.

This approach generates other **design plans** that come together with the relative **product,** where all the services and products relating to the systemic approach are defined, and with the **territory** where the relational system choices are acknowledged and made concrete.

A necessary step aiming to activate such an innovative strategic plan, would be to concretize the knowledge acquired within a university field, creating tight relationships both among the diverse analytical plans existing in the current context, and the planning needs.

In order to avoid handling utopian notions, just like a juggler, being stuck in an abstract dimension, I make reference to pilot projects, developed over the past few years, (see previously mentioned web-site), involving different but significant productive sectors of mechanics:

- with **NN euroball** where production outputs (oily mud) of the ball bearings have led toward planning a rethinking of the manufacturing process, focusing on the superficial tension of water, on its relapsing economic use and on its final launch, after being purified, on the environment and on trade fairs.
- with the **Salone del Gusto 08** where the project, rather than concentrating exclusively on the immediate message to send to the visitor, has concretely triggered a new economic development, converging all the considerations on the outputs generated by the exposition, replanning the way available resources (waste) can be replaced within the system, of energy.
- with **Agrindustria** which finds the material to be used to produce energy for its own manufacture, within 40/45 km, selling surplus and activating a number of positive economic outcomes, due to an optimized exploitation of outputs as inputs of other production systems.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design & Transition

What designers can learn from the Transition Movement

Jody Boehnert[1]

How can design participate in the great task of building a sustainable system? The primary tool in this transition is systems thinking. Design can facilitate change by learning to work with systems. Concepts such as design science, ecological literacy, footprinting and transformation design help. Yet a sustainable system is not something designers can deliver to communities. Communities are complex systems composed of people that need to engage with change to make change happen. The Transition movement engages communities in the collaborative design of a 'Local Energy Descent Plan'. The movement is a vision of UK permaculture teacher Rob Hopkins, and is now being enthusiastically adopted by communities worldwide. This paper explores new tools and concepts in design and the Transition movement.

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Design & Transition

We have no alternative but to learn to live within the natural imperatives of the ecosystem. How can design participate in this change? The primary tool in this transition is systems thinking, a conceptual process necessary for reconfiguration of systems that are presently entirely unsustainable. Design has the potential to communicate systems thinking and help embed new cognitive facilities into public consciousness. Design must embrace its ability to facilitate change by developing a vision of itself as a facilitator of transition using new methods, tools, and approaches. A new design paradigm is taking shape defined by both the democratization and the dematerialization of design processes. Thanks to the work of researchers in fields studying the interface between ecological systems and human culture we now have tools to catalyze systemic transformation. This paper will examine the ideas that will inform this transition in the design industry. Informed by design science, ecological literacy, footprinting tools and the transformation design model - design is now posed for a radical change. What this paper will bring that is new is an examination of the Transition movement as a model for social innovation.

The Transition movement is a community design initiative that facilitates re-localization for mitigation and adaptation to post-peak oil and climate change. The Transition phenomenon started in South West England in 2005 and has already gone viral. There are now (May 2008) 61 towns, cities or areas that have Transition initiatives active (with another 700+ in the process of adopting the method). A Transition Town is a space that has initiated a community design process mapping ‘energy descent’; a timetabled strategy for weaning the locality off fossil fuels. The Transition process creates agency and encourages practical action. The movement is a result of communities concerned with the lack of systemic plans comprehensive enough to respond to what they perceive as the threats ahead. Here communities organize to meet environmental challenges directly when government, business, and institutions fail to respond adequately to the challenges of climate change and peak oil. The movement as described in this paper is the vision of permaculture teacher Rob Hopkins, now completing a PhD at Plymouth University while nurturing the growing Transition Network, and his local group; Transition Town Totnes.

The Transition movement can also be seen as design activism - led by non-designers. The professional design community would be clever to take notice. This paper will map out a proposal for change, first by examining concepts, tools, and processes within design that address ecological problems. Part Two will focus on the Transition movement as a model that brings insights from nature - via permaculture, into community design processes. In Part Three, I will synthesize all this information into a proposal for transition in the design industry.

New Design Thinking

1. Design Science

Many of the ideas in this paper have their genesis in Buckminster’s Fullers writings on design science. Fuller held that to in order to be comprehensive, problem solving should work from the whole towards the particular. The concept of design science that he promoted was an integration of disciplines. Design science is based on the idea that each individual within society will be better off when we address the needs of everyone. Fuller maintained we could provide for all, but it will take a concerted effort and initiative. He promoted the concept of ‘the design initiative’ which asks designers to obtain the most comprehensive perspective possible, determine what needs to be done and to set out to do it. Taking the design initiative means creating jobs that need to be done, not waiting for outside clients to create jobs (Burns et all 2006,18). It was Fuller’s approach to systems, to a holistic appraisal of design problems and his encouragement of designers taking the

initiative to proactively use their creativity to solve societal problems - that anticipates the pragmatic problem solving strategies in new design thinking.

2. Ecological Literacy

> *The first step in our endeavor to build sustainable communities must be to become 'ecologically literate', i.e. to understand of the principles of organization, common to all living systems, that ecosystems have evolved to sustain the web of life…This systemic understanding of life allows us to formulate a set of principles of organization that may be identified as the basic principles of ecology and used as guidelines for building sustainable human communities... Thus, ecological literacy, or 'ecoliteracy', must become a critical skill for politicians, business leaders, professionals in all spheres, and should be the most important part of education at all levels* (Capra 2002, 201).

Ecological literacy is a powerful concept. It demands that we consider ecological systems and an awareness of how society operates within natural imperatives as an educational staple. This is a concept for patterning thoughts, organizing information and eventually behavior. It is a cognitive faculty that our educational systems have failed to instill. American educator David Orr describes this failure as a 'sin of omission and commission. Not only are we failing to teach the basics about how the earth works, but we are in fact teaching a large amount of stuff that is simply wrong. By failing to include ecological perspectives in any number of subjects, students are taught that ecology is unimportant' (Orr 1992, 85). Educators must address this issue with urgency. Ecological literacy is fundamental to support 'a rapid transition to a more restrained and elegant condition called sustainability' (Orr 2002, 79).

3. Footprinting

Ecological literacy creates a conceptual basis for integrated thinking about sustainability. Informed by ecological systems, researchers have created the tools to help designers grasp complex environmental information. Footprinting and life cycle analysis allow us to make assessments of the environmental impacts of a system, process or product. Perhaps the most powerful of all the new concepts (because it is the simplest) is the One Planet Living™ model (developed by WWF and BioRegional) that offers a clear vision of living within the planet's carrying capacity. One Planet Living™ presents a formidable challenge to a culture that currently lives off the resources of three planets (European average). Footprinting and One Planet Living™ are powerful conceptual tools that have the potential to clarify the meaning of 'sustainability'. The problem with the term 'sustainability' is that it has mutated beyond recognition to more than 70 different definitions (Wood 2007, 100). By developing tangible characterizations of the often mis-used term 'sustainability', footprinting tools provide indispensable mechanisms able to assess environmental impacts, thereby helping not only with the design of better products, but also providing mechanisms able to highlight misleading communications and greenwashing. Designers must embrace these tools and implement them across design disciplines with haste.

4. Transformation Design

The British Design Council's RED group has defined a new evolving discipline: transformation design. Transformation design is a radical revision of the role of design in society. While it creates a methodology for socially engaged design practice, it also challenges designers' traditional sphere of authorship, authority and influence. The key

features in this new discipline as defined by the Red team are listed here (Cottam et all 2005, 20-21):

1 Defining and redefining the brief
2 Collaborating between disciplines
3 Employing participatory design techniques
4 Building capacity, not dependency
5 Designing beyond traditional solutions
6 Creating fundamental change

In their report, the RED team recognizes that transformation design cannot be done by designers alone, and that as non-designers now take up design roles - traditional designers are in an uncomfortable position. Philosophical and practical challenges facing designers encountered with transformational design are profound and will need to be addressed for the new process to be embraced widely by the design community. Meanwhile, the Transition movement can be seen as an active embodiment of transformation design by non-designers. The transformation design model creates a link between traditional design practice and the Transition movement that we will explore in the next section.

The Transition Movement

The Transition movement, according to fan Richard Heinberg is 'a replicable strategy for harnessing the talent, vision, and goodwill of ordinary people' (Hopkins 2008, 9). It is a community design process based on the processes and principles of permaculture. The Transition movement is based on the assumption that we are approaching the end of the age of cheap oil, and that climate change and peak oil are twin challenges that must be addressed simultaneously. Where it differs from other environmental projects is that it maintains that within the challenge to wean our communities off fossil fuels, exists the potential for an extraordinary renaissance. Rob Hopkins references the work by Thomas Homer-Dixon who describes historical examples of the decline (or collapse) of complex civilizations who faced resource depletion as a parallel to our own situation. Homer-Dixon develops the idea of *catagenesis* (breakdown leading to rebirth), a term used by ecologists. He proposes that within moments of contingency there will be possibilities for profound change. Whether the outcome is turmoil or renewal in our case will depend largely on how well prepared we are and how the situation is framed. A renewal will depend on people taking the initiative to catalyze positive change. This is no small feat. Within the Transition movement the environmental crisis is acknowledged as severe, and the changes necessary are massive & systemic. The Transition movement holds that in addition to cutting carbon emissions, we must create resilient communities. Despite the big changes ahead, the Transition movement holds that the move towards localized energy efficient living could make a world that is better than our own.

Four Key Assumptions of Transition (Hopkins 2008, 134)

1. That life with dramatically lower energy consumption is inevitable.
2. That communities presently lack resilience.
3. That we have to act collectively.
4. That the collectively genius of a community can be powerful.

1. Energy Descent (Peak Oil & Climate Change)

A. Peak Oil

At the centre of Transition initiatives are our relationships with energy. The movement is a response to the powerful driver of change that is peak oil – a threat suddenly becoming more apparent as oil prices have recently climbed to record highs. Peak oil is based on significant and wide-ranging research reporting that fossil fuels supplies are hitting a peak after which time liquid fuel prices will increase dramatically as finite supplies diminish. Furthermore, our social and economic dependence on oil and gas constitutes an enormous vulnerability. Jonathon Porritt, Director of the UK charity Forum for the Future explains;

> *…the end of cheap oil means the end of easy economic growth, and the end of that whole 'historic interlude' in which cheap oil fuelled fast growth, high living standards and the kind of 'live for today, live for yourself' lifestyle that has now become so destructive…. Conventional economic growth and cheap oil have marched hand in hand for the best part of 60 years; within just a few years, it will become increasingly apparent that both are on their last legs* (Porritt 2007, 84).

The ultimate authoritative document on the subject is the Hirsch report commission by the US department of Energy in 2005:

> *the peaking of world oil production presents the US and the world with an unprecedented risk management problem. As peaking is approached, liquid fuel prices volatility will increase dramatically, and without timely mitigation, the economic, social and political costs will be unprecedented. Viable mitigation options exist on both the supply and demand sides, but to have substantial impact, they must be initiated more than a decade in advance of peaking* (Hirsh 2005, 2459).

In interview Robert Hirsch says, 'The risks to our economies and civilization are enormous - this is really an incredibly difficult and incredibly severe problem' (Hopkins 2008, 41).

The Transition movement is a response to this energy security threat. While both the Hirst report on peak oil and the Stern report on climate change illustrate the perils of these two issues in isolation, the Transition movement attempts to respond to the twin challenges simultaneously. As fossil fuels go into decline (because of availability and also carbon reduction programmes) we will see an economic contraction. Economic re-localization will be one of the inevitable impacts of the end of cheap transportation fuels. The danger is that unless we wean ourselves of fossil fuels proactively, societal support systems could crash just as the global climate gets pushed passed a tipping point (Hopkins 2008, 9). The political volatility of this stark danger means that national governments have been slow to react and few have openly acknowledged peak oil as a problem (with the Swedish and Irish governments as the exceptions). Meanwhile, the Transition movement maintains that we are as energy rich a society as we are ever likely to be, and that we must actively plan to wean our communities off fossil fuels.

B. Climate Change

There should be no need to restate the urgent need to address this momentous societal level challenge. On an intellectual level, anyone who reads the paper is acquainted with the facts and realizes we must act, but this awareness has not sunk in very deep. So far we are not making it happen; evidenced by the significant gap between the proscriptive actions recommended by scientists and our collective response. After several decades of warnings we are currently struggling to even meet lenient Kyoto emission targets (5.2% by 2012). If we do not act decisively our legacy to our descendents is bound to be bleak.

Once we engage with this issue, it becomes obvious that scientists are far more worried than most of us. NASA scientist James Hansen tells us: 'We have at the most, ten years - not ten years to decide upon action, but ten year to alter fundamentally the trajectory of global greenhouse emissions' (Hopkins 2008, 30). One of the disturbing things about listening to scientists studying climate change is the fear in their voices. Intellectually, we might accept some of the facts, but if we truly acknowledge Hansen's statements; 'multiple positive feedbacks can lead to rapid non-linear collapse' (Hansen et al. 2005, 1431) - in reference to climatic tipping points triggered by feedback mechanisms such as melting ice and the Albedo effect, the Siberian permafrost melt, or ecosystem collapse in the rainforest - we would have no justification for anything other than immediate mobilization and dramatic response.

2. Energy Shock

Hopkins explains that 'climate change says we should change, whereas peak oil says we will be forced to change' (Hopkins 2008, 37). Either way, the sooner we start to change, the higher the likelihood of a successful transition. Responding to climate change on an adequate scale will be expensive and demand an unprecedented degree of global cooperation. Hopkins reminds us that an economic recession (or worse) caused by raising oil prices, could make tackling climate change 'slide rapidly down the list of priorities'. Facing climate change with a depressed economy is the scenario we really want to avoid (Hopkins 2008, 39).

We are a civilization completely dependent on oil for almost everything we make, eat and do. When prices of oil go up (which will be inevitable as we start our way down the slope of declining oil reserves and increasing demand from growing economies) every economic transaction will be effected. Rob Hopkins references studies claiming there are no renewable energy sources primed to completely replace fossil fuels, and builds his argument around the net energy available: 'Energy Return on Energy Invested' (EROEI) goes down dramatically with renewables (Hopkins 2008, 53). Hopkins maintains that renewable energy will not fill the energy gap.

Whether or not another energy source could replace fossil fuels to power our economy is a fact that is widely contested. One promising projects is the Euro-Supergrid. A similar idea was first proposed by Buckminster Fuller in the 1970s (Fuller 1981, xxxiii). Now it is being promoted by TREC (Trans-Mediterranean Renewable Energy Cooperation) - an initiative of The Club of Rome as the answer to Europe's electrical energy needs. Nevertheless, weaning our economy off fossil fuels will undoubtedly be a shocking process and the sooner we start planning the better.

3. Collective Action

The Transition approach attempts to engage entire communities in the process of change. We will have to see extraordinary levels of change if we are to navigate our societies away from dependence on fossil fuels in such a way that they will be able to retain their social and ecological coherence and stability. It has been recognized by government agencies that sustainable development cannot be imposed from above. It will not take root unless people across the country are activity engaged with it. The UK Government's Sustainable Development Strategy sees public involvement as 'essential'. New methods such as citizens juries or panels, round tables, visioning, charette and new 'consensus conferences' have become necessary, and they arise from the realisation that environmental values are not preformed, but rather that they 'emerge out of debate, discussion, and challenges, as people encounter the facts, insights, and judgments contributed by others' (Owens 2000, 1145). The Transition movement addresses the need for engagement and awareness through local awareness raising processes. Transition initiatives effect policy by demonstrating what communities can do to address local problems.

4. Collective Genius of Groups

The Transition method draws from the diversity and intelligence of a group. It could be seen as a good example of Ezio Manzini's creative communities as 'groups of innovative citizens organizing themselves to solve a problem or to open a new possibility and doing so as a positive step in the learning process towards social and environmental sustainability' (Manzini 2007, 78). The Transition movement resembles the convergence of creative communities & collaborative networks that Manzini proscribes. Transition groups encourage processes such as art & story telling while collaborating on community design using processes such as open space events and using on-line wikis for energy descent planning.

Six Principles of Transition (Hopkins 2008, 141)

Visioning, Inclusion, Awareness Raising, Resilience, Psychological Insights, Appropriate Scaled Solutions.

1. Visioning

Central to the Transition approach is the idea we can only pro-actively move towards something if we can imagine it. Hopkins claims that the vision we have in our mind when we set out on this work will go a long way towards determining where we end up (Hopkins 2008, 141). Creating this vision of our desired outcome is key, and the focus is placed on generating a sense of inspiration. By focusing on possibilities rather than probabilities we steer our future into greener pastures. This focus on the positive does not preclude dealing with the dangers. The Transition movement also works with visioning scenarios (adaptation / evolution / collapse) to come to terms with factors driving change. But Hopkins maintains that our best chance of a successful transition will not come from presenting people with the worst scenarios – but the best. We stand, according to Hopkins 'on the cusp of many things, one of which could be an economic, cultural and social renaissance' (Hopkins 2008, 133) - but only if we set about with a vision to bring this vision into reality. Our best chance of dealing with climate change and peak oil will emerge from our ability to engage people in a vision of transition to a lower energy future as an adventure, something in which we can invest our hope and energy (Hopkins 2008, 49).

One particularly useful vision that Rob Hopkins uses to describe the energy descent process is the inversion of the classic peak oil graph. Hopkins plots our decent into cheap oil as a dive into a murky swamp that allowed us to seriously lose touch with reality (Hopkins 2008, 93). Drunk on cheap oil we put the entire world at risk with lifestyles entirely out of touch with our interdependence with the natural world. We can only save ourselves by bolting upward - out from the fossil fuel swamp - to the clean fresh air at the surface.

2. Inclusion

The Transition movement seeks to facilitate dialogue between different groups in order to create innovative solutions from cross-fertilization of ideas. The TM does not align itself with any political or ideological position. In order to be accessible to everyone in a community, regardless of previous commitment to environmental initiatives, traditional green rhetoric and aesthetics are avoided. Transition groups make space, events and design processes to help environmentalists dialogue with business groups, pensioners with young entrepreneurs, artists with farmers, etc. Here we find innovative solutions to our collective local problems using the collective genius of a group.

3. Awareness Raising

The Transition movement holds that the end of the age of oil is a confusing time. We are constantly exposed to and bewildered by mixed messages. The Transition

movement aims to set out its case clearly by giving people key arguments (Hopkins 2008, 141). Awareness raising addresses the failures in the education system to impart basic ecological literacy. This prioritization of education and awareness raising is supported by design commentators on change. Alastair Fuad-Luke says; 'sustainability has to be a cooperative ambition, a societal ambition, it requires that a society has a universal awareness of its condition before taking the radical steps on the sustainability road' (Fuad-Luke 2007, 37). A similar idea is developed by Ezio Manzini;

> *Given the nature and the dimension of this change, we have to see transition towards sustainability (and in particular, towards sustainable ways of living), as a wide-reaching social learning process in which the most diversified forms of knowledge and organizational capacities must be valorised in the most open and flexible ways, Among these, a particular role will be played by local initiatives that, in some ways, can be seen as signals of new behaviour and new ways of thinking* (Manzini 2007, 78).

4. Resilience

Resilience refers to the ability of a system (an individual, a whole economy, or a entire ecosystems) to hold together and maintain its ability to function in the face of change and shocks from the outside. The Transition movement asks: will communities, faced with the shock of fossil fuel price increase and/or mandatory carbon rationing for mitigation against climate change - retain essentially same function, structure, identity and feedbacks? According to economist David Fleming, a community that is resilient can absorb shocks, has a wide diversity of relations, and can meet needs without substantial travel. According to ecologists resilient systems are said to have the following characteristics: diversity, modularity, and tightness of feedbacks (Hopkins 2008, 55).

- **Diversity** relates to the number of elements that compose a particular system, be they people, species, business, institutions, or sources of food. A rise of monocultures reduces diversity.

- **Modularity** is the manner in which the components of a system are linked. Maximizing modularity with internal connections reduce vulnerability to any disruptions of wider networks. The over-networked natures of modern highly connected systems allow shock to travel rapidly through them.

- **Feedbacks** - tightness of feedbacks refers to how quickly and strongly the consequences of a change in one part of the system are felt and responded to in another part. Centralization weakens feedbacks by increased risk of crossing a threshold without detecting it in time.

Rob Hopkins explains that there are two transitions at work in the world today; the main transition is far larger, more powerful, and better resourced. This transition is rapidly dismantling what resilience remains under the guise of economic globalization and growth. The Transition movement is the building blocks of a new vision, a regeneration of the complex, diverse and resilient economies of a pre-cheap oil world (Hopkins 2008, 59).

5. Psychological Insights

The Transition movement recognizes that engagement with the issues and especially confronting the environmental crisis can be an overwhelming process. With the understanding that key barriers to participation are the presence of powerlessness, isolation, and despair, Transition initiatives draws on insights from psychology. In order to address emotional resistance to confronting depressing and de-motivating information, the Transition approach attempts to use psychological tools to engage groups in the process of change. This process of making space to psychologically process disturbing information is powerful. The Transition movement provides a framework to build the psychological strength that provides the basis for healthy engagement with change. Psychologists

Winder and Kroger explain that: ‘healthy functioning requires that we have faith in the future, without this confidence; our trust in the world is damaged. Damaged trust can lead to many neurotic reactions, narcissism, depression, paranoia, and compulsion’ (Hopkins 2008, 49). This is a situation Hopkins has labelled as ‘post-petroleum stress disorder’. Unprecedented levels of mental illness indicate that this ‘disorder’ could well be a common syndrome.

Within the Transition movement denial is accepted as a natural response, but one that must not be over-indulged. Understanding the psychology of change, TM accepts denial as normal, but maintains the need to remain vigilant to it (Hopkins 2008, 82). Much of these insights are drawn from the body of work on addiction treatment. The Transition movement uses tools like the FRAMES Model (feedbacks, responsibility, advice, empathy, self-efficacy) that breaks down the process of weaning an addict off a substance by mapping the change in stages: from pre-contemplation to action (Hopkins 2008, 89).

6. Credible and Appropriate Scale Solutions

A major flaw with most environmental initiatives is the lack of solutions on a scale that could realistically address the crisis. While media often glosses over the nuts and bolts of change on the sort of level that could meet emission levels recommended by scientists. The Transition movement enables people to explore solutions on a credible scale. Part of the reason TM is able to do this is that it looks at change at the level where basic energy use occurs – in communities. Many people see only two scales of response, individual and government. The Transition model explores the ground in between. Certainly macro level solutions to climate change and peak oil are essential - but in democracies these can only happen with the support of the people. Sustainable development demands that people engage with change; it cannot be delivered ‘top down’ to the masses because people need to engage with the issues to understand the solutions.

The Basis of Transition: Permaculture

The Transition movement is inspired by permaculture, a design philosophy based on ecological principles and ethics for working with Nature in building systems to support human existence (Hopkins 2008, 137). The Transition movement attempts to mainstream permaculturist principles. Permaculture has a number of guiding principles that help it take account of existing systems and plan in complexity. It encourages strategies that contribute resilience and stability to ecosystems and other systems alike. The most important lesson, however, from permaculture is that it emphasizes the interdependence between human settlements and the natural world. The ecologist, Aldo Leopold wrote; “ethics is awareness of independence” (Burns et all 2006,17). With this awareness of natural processes and acknowledgement that every design affects the system as a whole, permaculture weaves ethics into its methodology. This brings us to the crux of the problem for designers. Ethics are a fundamental ingredient in any design problem, but have been conspicuously absent from design practice and discourse. The original environmentalist, Ralph Emerson, explained; ‘methodology without principles are useless or worse’. It is time for designers to end their vain attempt to separate ethics from design. Any designed item is part of a larger system and every design has ecological, social, and economic impacts. Ethics must inform all design disciplines – for the sake of all living systems.

Synthesis

Inherent within the Transition movement are the all the characteristics of transformation design except the designers themselves. The movement redefines community design processes, creates zones for collaboration and builds the capacity of ordinary people to create fundamental change. The movement is a sign of the radical democratization of design with everyday people designing energy descent in their own communities. Many of the challenges to designers described by the Red team in regards to transformation design apply here, as non-designers are actively designing processes and systems in their own communities to face the epic challenges ahead. Traditional designers will have to adapt to find their role in this process.

Designers are needed in the Transition process. The skills to build cohesion, focus and to communicate new agendas are needed in the Transition movement and designers have the skill set to do this. Unfortunately, according to Alastair Fuad-Luke, only 1% of 'iconic' designers are even engaged with sustainability (Fuad-Luke 2007, 25). Thus, the question that must be examined is: do designers themselves see enough of the bigger picture to want to engage in a process of change?

Design education has a responsibility to address the shortcomings in its current methodology. Designers could be of great value to the transition - if they decide to chart new territory. David Orr rightly claims that a well-educated person will make him/herself relevant to the crisis of our age (Orr 1992, 108). Educators must build awareness and methodologies in design to address social & environmental problems holistically - rather than the 'patchwork solutions on a larger pattern of disorder' (Orr 2002, 11) that dominates so much of the industry presently.

In order to be relevant in a changing world, designers need to engage with the powerful drivers of change that are peak oil and climate change. As explored in Part One, design science has mapped out the territory of systems design and the design initiative. Ecological literacy provides the cognitive framework to understand our basic systemic challenges. Footprinting tools allow designers to make and communicate realistic assessments of the value of systems, designs, and processes. Transformation design completely re-visions the role of the designer in a social context and allows designers to use their creativity to address social, economic and ecological problems. Meanwhile all these approaches/tools/ideas are incorporated in the Transition movement that is a holistic, inclusive and comprehensive methodology for designing transition in localised communities.

Conclusion

This paper has shown how the community design process of the Transition movement can inform the design industry in its attempt to confront the issues of sustainability. John Thackara calls on designers to become part of the solution, as 'global hunter-gatherers of models, processes, and ways of living that already exist, or used to… Creative design practice these days is about adapting solutions found in one context for use in another' (Thackara 2007, xvii). This borrowing and adapting is what the Transition movement does - and what this paper is doing. Thackara claims that most of the elements of a sustainable world already exist and the majority are social practices. The Transition movement is a synthesis of diverse practices and fields of study in order to address the pressing ecological problems of our age.

This paper first described several concepts within a designer's toolkit enabling her to confront the ecological crisis, then mapped out a vision and an approach to systemic change as defined by the Transition movement, and presented a potential synthesis. The Transition movement could be an inspiration for professional designers. What we require is the will to put the change in motion. We are at the precipice of an unprecedented ecological crisis, yet strangely - as noted by Thomas Homer-Dixon and Rob Hopkins, within this upheaval is the potential for profound renewal. According to Hopkins, energy

descent will be a journey towards sanity and wholeness; ‘Any response that is sufficient to the scale of the challenge is about coming home, about being aware that we are part of the networks around us, and that we need to nurture and rebuild them rather than imaging that we can survive independently of them’ (Hopkins 2008, 81). The Transition movement provides us with ‘scalable microcosms of hope’ that offer a collection of insights and processes to help communities navigate the transition ahead.

The design industry needs to recognize that a societal level challenge to avoid climatic tipping points is different from other issues that compete for industry attention. The design industry needs to realize that it functions at a strategic leverage point; it has the capacity to instigate radical change and influence many industries, cultures and communities. The speed, scope, and scale of the challenge are critical. This industry needs to respond to the unanimous call by the world’s climate scientists. We possibly have ten years to do this work (Hopkins 2008, 30).

Helping to embed ecological awareness into the cultural mindset is a formidable task. Helping to reconfigure infrastructures is an awesome feat. Designers will no longer be capable of feigning innocence in an era with a challenge as great as climate change and energy shocks. Design motivates action and our actions have implications; designers are implicit. Design is still part of the problem, but it is capable of becoming part of the solution. It is up to us - now, to make it happen.

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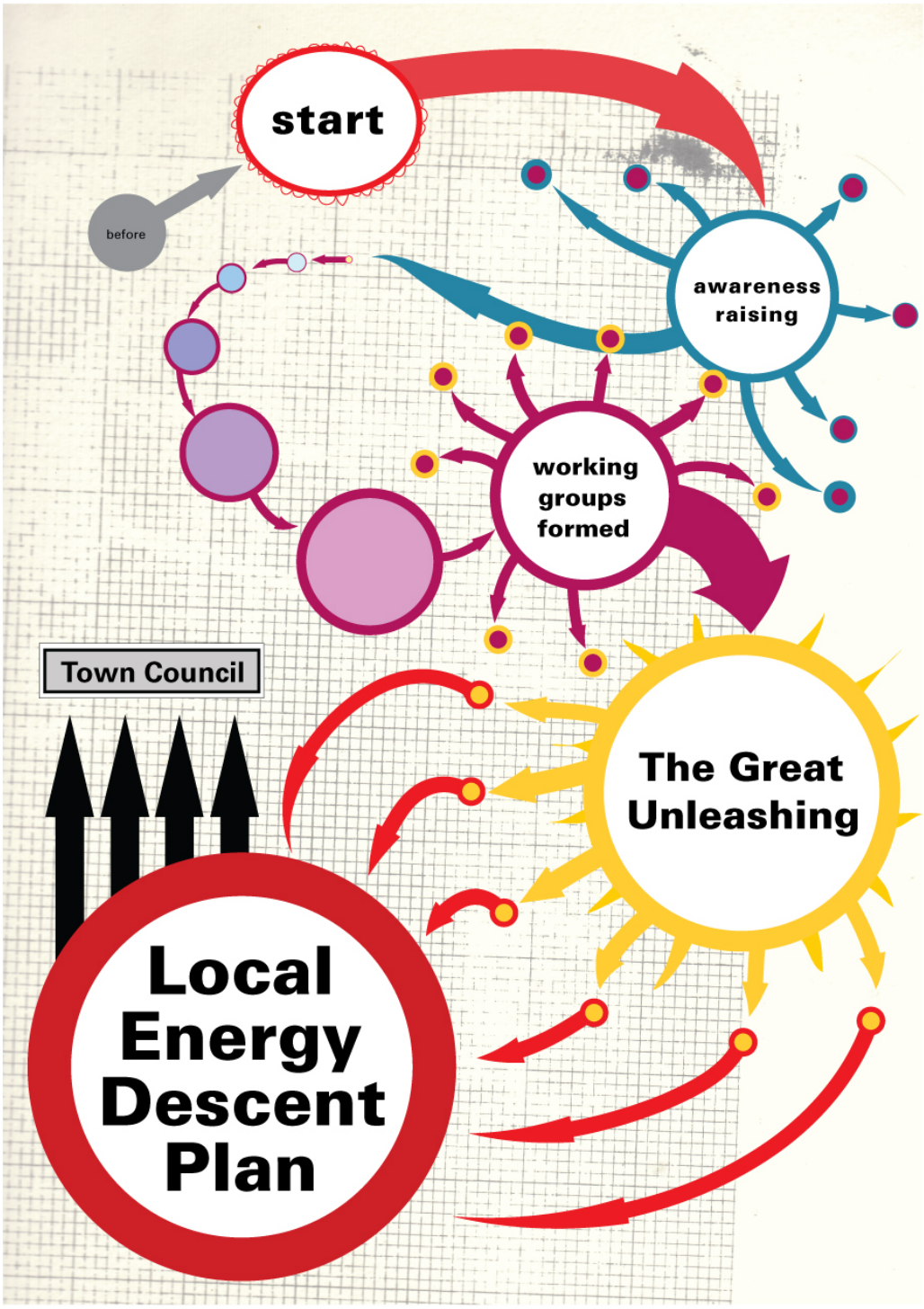
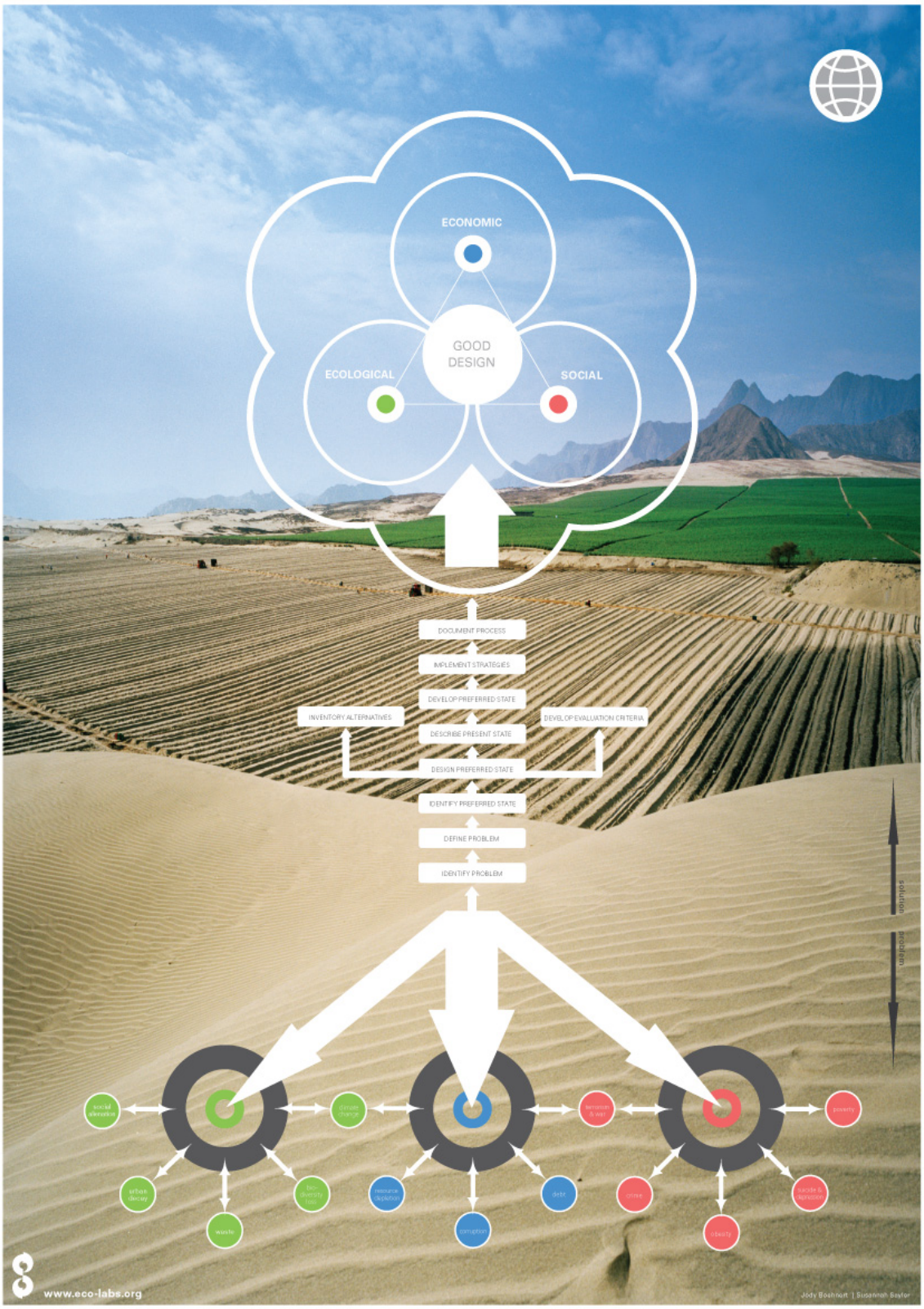
Local Energy Descent Plan

A *community design process mapping 'energy descent'; a timetabled strategy for weaning a locality off fossil fuels.*



The Transition Process
Stages in the Transition movement community design process.



Ecological Literacy & New Design Thinking.

Ecological literacy requires systems thinking. Good design is grounded in ecological literacy and reflects an awareness of its economic, social and environmental impacts.

Photograph by Susanne Saylor: http://www.canary-project.org

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Research in strategic design: a teaching experience

The design research school model to build a dialog between Brazilian university, society and industry.

Gustavo Severo de Borba[1], Paulo Belo Reyes[2], Roberto Galisai[3]

Abstract

The higher education reality in Brazilian universities, especially in design area, has faced some problems. Among them, the design research in Brazil, most of times, are developed inside the university walls and separated from industries. This is reinforced by a misunderstanding of the design concept generaly related to product design.

Considering these questions, University of Vale dos Sinos (UNISINOS), in a partnership with POLI.design, *Consorzio del Politecnico di Milano* proposed the construction of the first Design Research School, in Rio Grande do Sul.

This paper presents the principles of this new school, which considers the real necessities of Brazilian society; and propose a new model, where sustainability is a key factor to all areas, in the different school actuation levels.

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1. Introduction

The higher education reality in Brazilian universities, especially in design area, has faced some problems. Among them, is important to consider the fact that design research in Brazil are, most of times, developed inside the university walls and separated from market and industries. This is reinforced by a misunderstanding of the design concept, perceived in our country, only related to product design. At the same time, the development of design disciplinary area in Brazilian universities is relatively young.

Considering these questions, University of Vale dos Sinos (UNISINOS), in a partnership with POLI.design, Consorzio del Politecnico di Milano proposed the construction of the first Design Research School, in Rio Grande do Sul, south of Brazil.

The result of this process was a new concept, comprehending the implementation of a design school, outside the original campus of UNISINOS – that is located in São Leopoldo. This campus was building in the heart of Porto Alegre, Rio Grande do Sul, south of Brazil.

The school is composing of three different areas (teaching, research and consultancy) and propose a space, that considers research as a key factor, to build a dialog between university, society and industry, achieving a new form of Sustainable development, a new model of change involving companies, university and local institutions.

This paper presents the principles of this new school, which considers the real necessities of Brazilian society; and proposes a new model, where sustainability is a key factor to all areas, in the different school actuation levels. Besides that, some cases are introduced. In the under graduation level, we will discuss a project developed by students for an industry that produces different products (door hangers, auxiliary tables, magazine holders, office accessories) using plastic components. The company had defined a project briefing and had followed all process, supporting students work. At the end, they had chosen some design concepts that will generate prototypes for new products.

Another important experience had occurred in a strategic design latu sensu course. In this case an entrepreneur had provided part of his land (in a rural area), to be used in a design applied exercise for developing a new kind local development project. As a result, our students developed a project that connects this region to the heart of Porto Alegre.

Finally, we present a case study developed in a furniture company. In this case, we present a project where the main objective was defining a new concept for product development. This cases are specified in this article, as examples of the methodology used in Design School of UNISINOS.

This paper is organized as follow: first, we present the principles of this new teaching and research structure, which consider market necessities and look for sustainability. Then, we describe the design concept used by our design school, which considers the strategic dimension of design. In this moment, we compare our understanding of design with concepts in use in others schools in Brazil. Following, we present three case studies that were developed by our students and consultants. Finally, we present the conclusion of this paper, considering the results obtained and future projects.

2. Research Context

There are several perspectives about the social context which sums up the globalization issue. Among these, the Bauman liquid modernity, the Castells Network modernity, the Maffesoli tribe modernity, and Baudrillard consumption society are visible. Besides their relationship, one of the concept related directly to the purpose of this paper is Lipovetsky hipermodern society.

For Lipovetsky, the thought and everyday practices configures a paradox between present conception and the future at the same time. Let´s review this context in the time.

The pre-modern societies had the social structure characterized by historical foundations and determined by the past. As the modernity emergence occurred, the values were changed and a new paradigm appeared: the society began to trust in human potential and technological capacity to act in the social field and organize the future efficiently.

In the end of 20th century, the modern project started to fail as efficiency proct. Several elements reinforce this disbelief in a new project: revolutionary projects failure, great ideologies and utopias breakdown, new individualism culture centered in the present, among others (Lipovetsky, 2004).

In this context, emerges a new concept designed as “post”. The new concept – post modernity – feeds a theoretical discussion about a paradigm shift that evokes the importance of the present, not the future, considering technological conquests, related to information technology.

The designation – post – refers to an ending. Regardless this question, Lipovestky affirms that this phase is not finished. In fact, the conceptual bases are amply in a new format called “late or hyper modernity”. The Characteristics of Hyper modernity including a deep faith in humanity's ability to understand, control, and manipulate aspects of human experience.

We are living a moment marked by a hyper-consumism, hyper-individualism and an uncertain future. Media are constantly presenting elements related to this subject. Figure 1 presents, two Brazilian magazines that discuss this question – hyper-consumism and sustentability.

3. Sustainability and design

Starting of this context, there’s an evident problem which arises in different debate’s forums: the planet’s sustainability and the turning responsible process of each person considering this question.

Clearly it’s not about counting some of the possible alternatives, but the purpose is to put in evidence an educational experience that adopts this question as ethical and esthetical principals in the professional designer’s formation and in its relation with the society.

Before the report of the educational experience, it’s necessary to introduce two concepts which form the basis of this experience: the concepts of sustainability and design.

The sustainability concept defined by the “World Commission for Environment and Development,” WCED, 1987, and which serves as basis for the “Rio Eco 92” event it’s “to supply the needs of the present generation without affecting the possibility of the future generations to supply them.” This concept can be discussed, according to Penin, as the following explanations: “means a social and productive systemic condition, where is possible to obtain at the same time: the overcoming of the environmental destruction, the economic development and the social and justice equality.” If we support the notion of sustainability in three dimensions: environmental, economical and social, the belief is that the action to deal with this problem should link these three dimensions. Despite the evidence of this argument, it’s important consider that the biggest part of those actions is restricted to environmental actions that don’t consider social and economical aspects.

Before a more intensive discussion about this question, it's important to turn clear the design concept that we are working with. Since the industrialization process, designers have been acting on products wanting to make them more valuable. Most recently, with changes in the economy, a great variety in products quality appears. The products are presented besides their materiality, but in its immateriality. The actual economy focused not just in the product but in its relationship with the consumer and its purchase ambient. The extended market confronts the designer with a dilemma: operate in a hyper-consumption society, or in opposition of it, in a conscious\ process about this consumption (Celaschi, 2007).

To Penin, it's possible to reduce these problems in two questions:

- Technologic-productive:

  garbage solutions;

  clean technologies and otimization of materials;

  design and re-design of sustainable products.

- Social-cultural innovation:

  Social behavior changes as new consumption posture and new notions about well being.

In the technological-productive perspective, we've been seeing lots of actions to confront the sustainability problem. About the garbage, each time more the population it's adopting as day-by-day practical the selective garbage collect. In the case of the clean technologies and optimization of materials usage, the actions are more restricts and in a smaller quantity, focusing in some production processes that already have the emphatic use of that practice as a production rule. In products design, the focus is even more restrict, concentrated in some designers who have transformed their work in a conscious practice.

Anyway, all of those three precedent points are focused on consumption products. So, if we want to compose a logical of the opposition of the productive process, that gives emphasis to the hyper consumption, is necessary that besides the operative practical about sustainable quality of the products, it should be more focus in process than in products. This means, the precedent actions are necessaries, but not enough to an effective action.

With this, we move to the second question: social-cultural innovation. In this eration is more focused in the process than in the products. This means that the consumption focus it's not anymore in products but in the experiences and services. Thus, the market operates less with materialitie and more with the immaterialities. The products reduction in the marketplace turns into a consequence that provides from changes in the purchasing posture.

Like this, we indicate a behavior change much more than solve the objects problems and theirs hyper-consumptions.

4. Behavior's changes

Many cases, internationally, has been presenting themselves as alternatives to the process of globalization and hyper-consumption. Cases as the EMUDE, the CCSL, and the IVIS, indicates and systematize these new purchasing practices.

In EMUDE's case, Emerging User Demands for Sustainable Solutions, social innovation solutions are analyzed, concentrated in actions realized in European communities.

The CCSL, Comunidades Criativas e Estilos de Vida Sustentáveis, aims to investigate study of cases in Brazil, Índia and China of social innovation of communitarian basis and its implication in the dissemination of a more sustainable day-by-day life in urban contexts and new sustainable life-styles, visualized by Ezio Manzini & François Jegou. This project was part of a conference

called “creative communities” organized by Laboratório e Desenvolvimento Social (LTDS) of COPPE/UFRJ, coordinated by Professor Roberto Bartholo and it happens in April 2007.

The result from that conference was the constitution of IVIS, Instituto Virtual de Inovação Social e Design which has as goal, the identification and systematization of design practices with focus in social sustainability as innovation process in the Brazilian territory.

In this context, of enlargement of the designer acting, as well as the sustainable process valorization, becomes necessary a new teaching model, which interacts with society and with productive system to generate knowledge. The propose built by UNISINOS can be seen as an answer to this scenery.

5. School of Design - Unisinos

The university in Brazil is going through a period of inevitable and hard change. Beside the big public universities known of places of excellence, there are private universities of several levels in the country.

The companies and students favour an education and a research activity connected to a global university system, able to broad mind for wider linguistic possibilities all over the world.

Few universities have comprehended that the isolation concerning the social and productive system (industrial and financial systems) is disadvantageous and most activates a model of education that nowadays is not sustainable. To confront continually with these systems means to produce knowledge and contribute to innovate the system which takes part today, promoting a virtuous spiral of positive change in the country.

Through an international partnership with the POLI design, Consorzio del Politécnico di Milano, Unisinos, Universidade do Vale do Rio Sinos has chosen to open its offer of education also to the disciplinary sphere of design, developing a model of school of design based on a continuous innovation of the organizational model and of products offered. The model proposes:

- knowledge production, and not only knowledge distribution (model of research anglo-saxonic university);
- continuous innovation of professional profiles offered and of formatives typologies practiced;
- internationalization of curriculums (international professoriate and students engagement) and of the contacts of research;
- continual confrontation of the own contents with civil society and with the production system (continual education and production of applied research and specialize in companies, associations and local members).

For design we understand “culture of project” as:

- element of conjunction among science, management, creativity and know to do organized (between university and industry) in tunning with the concept of knowledge society.
- innovation process able to offer new responses and solutions to the necessities of the society, being the designer an agent able to introduce oneself in a cooperative and trans disciplinary way to produce, through strategies of innovation and creation of meaning to products and services, considering the environment and the availability unlimited of material and energetic resources;

The School integrates activities of education in graduation (Graduation in Design) and post graduation lato sensu (Specialization in Strategic Design), research activities (Master in Design) and activities in consultancy and continual education.

In the context, the professor and the students assume a role of centrality. Moreover, the academic activities are constantly articulated with the entrepreneur atmosphere from different processes, for instance:

- company study of case: in the courses of graduation and specialization, the organizations can be the object of study for the proposition of new products or services, considering the concepts of strategic design.
- comprehension of reality and project atmosphere: the companies can cause, in the research sphere, applied analysis considering the theoretical foundations of groups of research. In this way, metaprojectual researches, diagnosis of the sector, or even applied projects, can take place, always considering the areas integrations.

6. COZA Case

The innovation process involves generally 3 categories of actors in the contemporaneous production, that are: the producer, the company that invest a certain capital to making practical the Idea of the business identified, the consumer and an intermediate category that is commonly defined as of the mediators of the process (Celaschi 2007).

In general the innovation process is generated by this third category. There are many figures that operate in the territory of relation between productions and use/consume market.

This study of case highlights the sphere of activities of mediation, promoted by the School of Design UNISINOS together with the company COZA, domestic vanguard in objects of home use for classes A and B. The theme of the project invites the student for a reflection about the opposition between order and disorder to identify and to project new solutions of domestic use.

The general objectives of collaboration between school and company were basically:

- Activate a dialogue of project between the school and the innovative organizations in its ways of acting, able to enrich the processes of research and education generated in the school of design.
- Establish a real experience, giving form to the entailment of exercises and enriching the didactics experimentations of projections,
- Approximate to the job market potential future talents, starting a virtuous cycle in the relation knowledge-profession,
- At last, establish a link and a permanent way of culture diffusion of the project as a factor of value and competitiveness of industry and market and consequently as a factor of progress for the society.

In every Project developed, became evident the capacity that the students can reach good degrees of interpretations of a problem of a proposed design. Such interpretations made clear that the proposed solutions would be at least stimulations of innovation of new looks, much different than an approach focused in a mere formal-functional solution.

Two of the presented projects presented for the development and engineering relation were selected. Today the company has put the products in the production line and has opened position for the hiring of a trainee student.

The aim is to be ready for an industrial production in approximately six months, and can be launched in important events of the sector that takes place in the second semester in 2008, exposing in the products the companies and the school label associations, crowning, then, a rich approximation of two worlds.

At the same time, company and school, already in a mutual confidence relation, start to elaborate ordinary projects to be officially articulated and activated in the course next year.

7. Conclusion

The present work had as a goal present the existing structure in the School of Design UNISINOS, an answer to the challenges presented by the post modern society. One can realize the project alignment to social demands, considering as an element of fundamental importance the alignment and theoretical discussion.

For the comprehension of this process, the Coza case was described, where the fields of the School: Design Centre, Research and Graduation, took part and developed a considerable Project. It is important to reinforce that this work can be evaluated considering the quality of the projects presented.

However, the main acquisition is realized in the evaluation of the interfaces built, for the consolidation of the integration concept in the School. One proposes as unfolding of the present work a continual process of reflection about the existing interfaces between fields, considering as premises the academic excellence and the research with applied result adding value for the society.

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Fig. 1: We are living a moment marked by a hyper-consumism, hyper-individualism and an uncertain future. Media are constantly presenting elements related to this subject (Exame and Veja, two Brazilian magazines discuss this question).

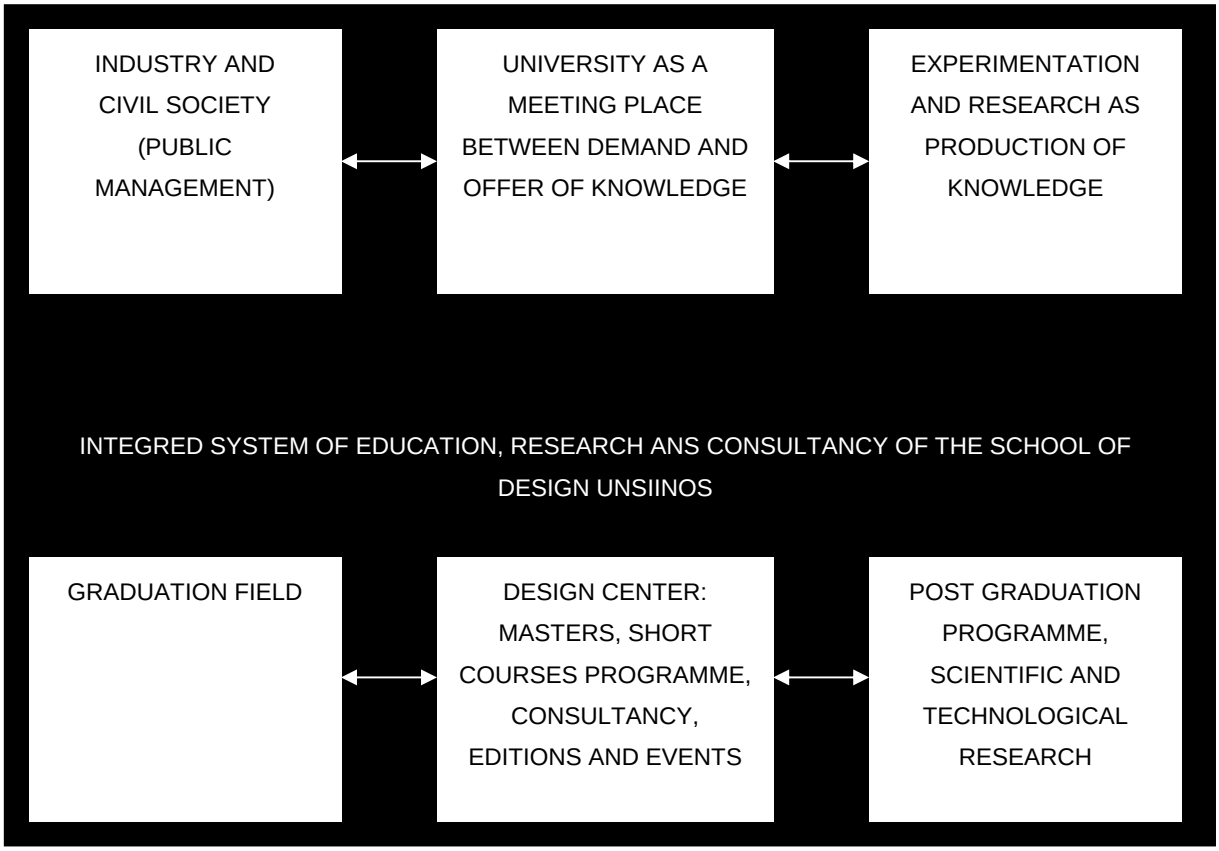
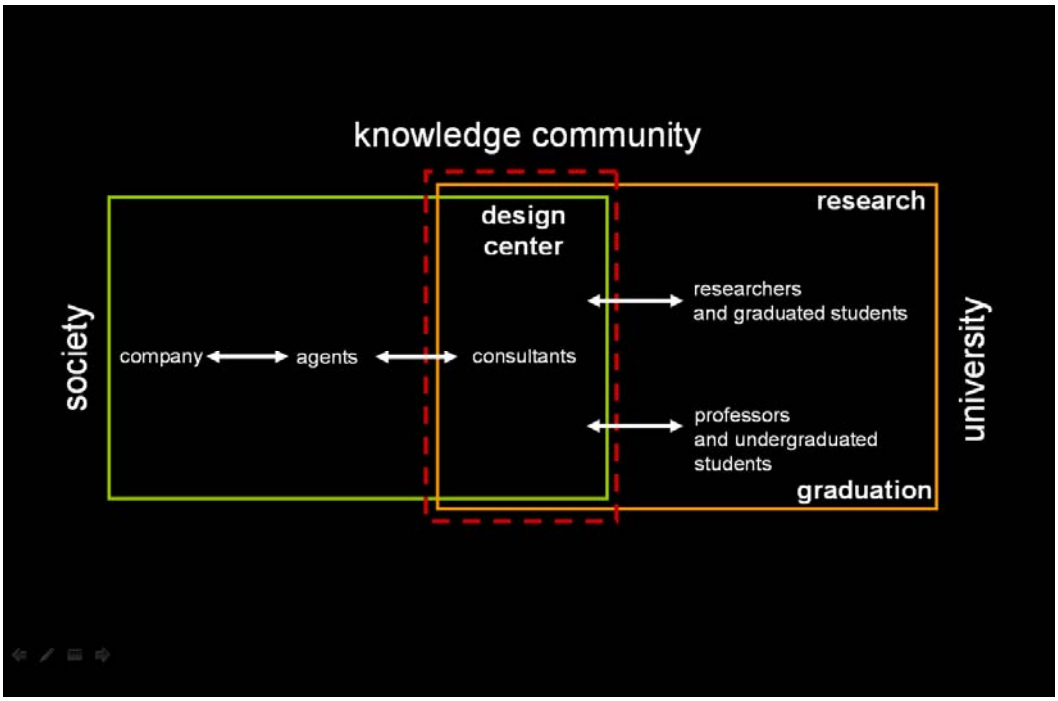


Fig. 2: The Design Research School of Unisinos.



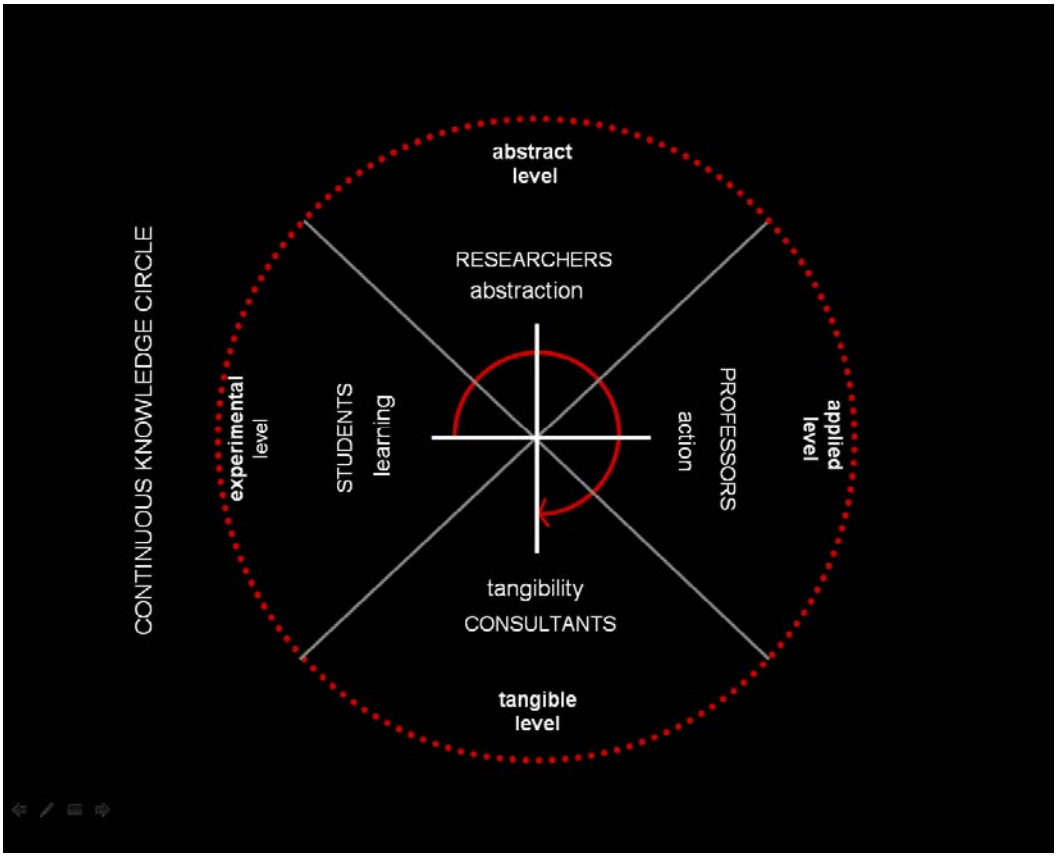


Fig.3: The Learning School Model and the ontinuous knowledge circle

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Integration of Haptics into the Design

A designer-oriented tool for virtual clay modeling

Monica Bordegoni[1], Umberto Cugini[2]

Abstract

The paper presents a modeling system that allows stylists first to generate digital shapes in a natural and intuitive way by manipulating a haptic tool that closely resembles a physical rake, and then to evaluate the created shape with an additional haptic tool allowing the exploration of surfaces.

The system aims at providing more intuitive ways of working and more user-centred modeling tools based on “model making” approach. Stylists may conceive, represent and evaluate their design without depending on CAS expert designers and engineers. The evaluation of the conceptual shapes of new products is fully based on virtual models, therefore the number of physical prototypes required in the whole product development cycle would diminish, going towards a more economic, ecological and also social sustainable product development process.

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1. Introduction

The design process of aesthetic products includes a typical iterative sequence of activities. The process starts from an initial idea or concept of the product and moves on to the representation of this idea through a modeling phase. Typically, the stylist translates his mental model of the product into 2D sketches, mainly based on synthetic and simplified representation of shapes based on characteristic lines. The sketches are given to a modeler who builds a coherent physical model, or to a CAS (Computer Aided Styling) designer who creates a digital model. If a digital model only is produced, the evaluation of the concept can be performed purely visually; anyway, a Physical Mock-Up (PMU) is always required for a complete evaluation of the design (Yamada 1997). In case, as it often happens, the shape is not fully satisfactory and must be refined, some modifications are performed on the model and the process cycles several times around this loop until a fully satisfied result is reached, or the time available is over (Figure 1 - a).

The correlation of the two product models -digital and physical- is not straightforward. The physical mock-up cannot be immediately derived from the digital model, but instead it requires a production phase that can be manual or consisting of a technological process including CAM (Computer Aided Manufacturing), milling and finishing activities, or through Rapid Prototyping. Conversely, the digital model can be created from a physical object through Reverse Engineering activities (Lee 1999).

Before reaching a final satisfactory shape of the product the various activities are performed several times; that means that several loops are carried out, and therefore several physical prototypes are built. Just to give an idea of the size of the problem we report some figures provided by Alessi (http://www.alessi.com) - a well-known Italian company operating in the sector of household design - related to the role of PMUs in their design process. Alessi produced about 1000 physical prototypes in year 2007, had about 300 open projects and 50 products finally developed, and plans to produce more than 1200 physical prototypes in year 2008.

Every time a PMU is needed for the evaluation of a new product the design process breaks up and the prototype is physically built. This activity requires long time that is at least an order of magnitude higher than the time required by the other phases of the product development process. Therefore, it is rather common that in order to meet time and cost constraints, the number of PMUs is dropped down. The direct consequence is that fewer solutions can be evaluated to the disadvantage of products quality and innovation.

An issue pursued by companies is to find a trade-off between obtaining the best result among the various identified solutions in the shortest time. We have seen that in the design process most of time is dedicated to build PMUs. Ideally, the number of PMUs should be diminished while maintaining high level of the quality of the product. Since PMUs are important to the aim of assessing the product design, the focus of the research is studying new tools that allow the reduction of the number of PMUs, while maintaining and possibly increasing the quality of the products, and exploiting the knowledge of the designers. Specifically in the industrial design domain, the technology is expected to support creativity and to enable the re-use and exploitation of designers' know-how, and also amplify the knowledge and acquired experience in a shorter time.

The paper presents the results of the research project *T'nD – Touch and Design* funded by the European Union (http://www.touch-and-design.eu), where we have developed a system that allows stylists first to generate digital shapes in a natural and intuitive way by manipulating a haptic tool that closely resembles the physical rake they are used to use in everyday activities, and then to evaluate the created shape with an additional haptic tool allowing the exploration of shapes (Bordegoni and Cugini 2006).

2. Towards a sustainable product development

The goal of the research work presented in this paper is to study tools for modeling and evaluating aesthetic products based on new designer-oriented interaction modalities. In order to design new interactive tools oriented to designers, it is necessary to better understand the various phases of the design process, the methods and tools currently used and their weak and strong aspects, and the profile and skills of the users of these tools.

Two main practices are used for representing concepts of new products: hand-made prototypes and full digital models. Handmade prototypes are created by skilled designers, stylists and model makers by means of modeling malleable materials using their hands and basic craft tools. These people are sort of artists who create products by modeling materials like resin, foam material, and clay using their hands and crafts tools. Some studies have demonstrated that visual, tactile and kinesthetic feedbacks are jointly important in the shape creation and evaluation process (Poitou 1974). Specifically, a craftsperson needs to touch his work; this touch is physical and continual, and provides control of the whole shape creation process. The process is creative, dynamic and evolving, where stylists give form to shapes by continuously interacting with them, thus in a continuous process of creation, perception and understanding. Modelers gather plenty of information by touching the physical mock-up, encompassing it, sliding hands around it, manipulating it and, of course, simulating its real usage. Modelers take benefit of these feedbacks to create shapes, to comprehend them, to check their adequacy to the initial or evolving idea and sometimes to the preliminary definition in form of drawings, and to evaluate the mock-up quality. By gestures done to physically explore the PMU, they enrich their mental representation of the shape, which helps to appreciate and criticize its features. This practice is expensive and requires long time of execution. Besides, some reverse engineering techniques are required for building the digital model of the physical prototype for subsequent manufacturing activities.

The other practice consists of CAS (Computer Aided Styling) or CAD (Computer Aided Design) tools used by designers for making digital models. In general, designers consider these tools too technical, and lacking intuitive user interfaces. The creation of a shape is usually done by handling surface control points, and the evaluation of the quality of the surface is performed using functions like reflection lines and porcupine diagrams. Although these modalities are useful, they are not completely satisfactory for designers who want anyway to touch the object shape in order to assess the design. Yet there is the necessity to physically build the prototype so that designers may evaluate the quality of the model through physical touch.

In the recent years CAS/CAD tools functionalities have been improved in order to offer more powerful and user-oriented functions, and user-centred interfaces. Very recently, haptic interfaces have been added to shape modeling tools (Cheshire at al. 2001; Dachille et al. 2001). This emerging technology allows users to interact with a virtual object through the sense of touch (Laycock at al. 2003; Hayward et al. 2004). Designers may use interaction devices that give touch feedback related to the shape they are creating. That aims at allowing faster and more natural shape design workflow than with traditional methods.

If we consider the evolution of the tools oriented to product design, we notice that they have been improved mainly in an incremental way by adding new functionalities (i.e., global shape modeling) and interaction modalities and devices (haptic interfaces), but without changing the basic paradigm related to processes and procedures of product design. In this application context, our research work aims at developing product design tools of new generation where the product shape creation and evaluation is based on a “manual making” approach, which is expected to have a strong impact on the product life cycle.

According to this new design paradigm, the stylist starts drawing the sketches of the new product, and then he himself may directly create the model from these sketches using in the developed system his sketch lines as rakes profiles if he likes, and afterwards he is able to evaluate the model by using the visual and touch modalities offered by the system, and eventually, when the design is mostly assessed, he may decide to send the model directly to

Rapid Prototyping or milling tools for physically building the product (Figure 1 – b). The major benefits of this new design paradigm are that the stylist can conceive, represent, model and evaluate its design without depending on CAS expert designers and engineers, and that the number of physical prototypes required in the whole product development cycle would diminish, going towards a more economic, ecological and also social sustainable product development process.

3. Haptic interfaces for virtual modeling

Haptic modeling is concerned with modeling of virtual shapes using haptic technologies. Haptic modeling systems allow users to touch, feel, manipulate and model objects in a 3D environment that is similar to a natural setting. The only shape modeling system commercially available is FreeForm by SensAble Technologies Inc. (FreeForm application), which is based on the Phantom haptic device (Phantom device). By using this application, the users work directly with the digital clay using the Phantom stylus as a modeling tool. Hardness and surface smoothness of the clay can be varied, and different modeling tools can be selected. The material can be removed using some carving operators, but the user can also work from inside out pulling and deforming the shape. The main problem designers have reported concerns the difficulty in getting used to the tool and to the forces required for removing material with a constant depth. In addition, the fact that the application uses a voxel model does not allow them to have a high quality surface in terms of smoothness and continuity that can be immediately re-used in the downstream activities of product development.

Within the context of the T'nD European project (http://www.touch-and-design.eu) we have studied new interaction modalities for shape modeling based on user-centered haptic tools. During the study and the design of these tools, great attention has been put on the usability and on intuitiveness aspects of the interaction modalities with virtual models. In fact, our tools are intended to provide ways of interaction that are easy, intuitive and pleasant to use for product designers so as to convince them to adopt the system as a daily working tool.

The target users of our system are stylists and model makers who are used to model physical prototypes of product by hands, and designers with some experience in using digital modeling tools. These users have motor and tactile capabilities that are well exploited during manual modeling of plastic materials. The skills they have in their hands allow them to intuitively create physical models from ideas, and to check surface quality just passing their hands over the newly created shape. The idea of this research work is providing a system that offers all the good features of CAS/CAD tools with improved user interface and interaction modalities that preserve and exploit designers' manual skills. Differently from other research works related to haptic modeling and virtual clay modeling (Cheshire et al. 2001; Dachille et al. 2001; Dewaele and Cani 2003) the aim of this work is to develop new haptic tools and modeling modalities which are effectively oriented to designers, and which are specified and evaluated by the designers themselves.

Designers have been observed while modeling physical prototypes of products in order to deriving some specifications for the new system user interface. Cognitive psychologists participating in the research project have observed and studied modelers while modeling physical prototypes using their hands and craft tools. Modelers of industrial partners of the project have been video recorded and interviewed while creating physical models of some selected objects (a vacuum cleaner and a car C-pillar) by working malleable materials (like clay, foam material, etc.) with their hands and tools like rakes, sandpaper, templates, cutters. Subsequently, the collected data have been quantitatively and qualitatively analyzed in order to understand the advantages derived from operating manually when creating shapes, and to understand the modelers' knowledge that is in their hands. The results of the analysis are reported in detail in (Giraudo and Bordegoni 2005). In synthesis, the analysis of hand gestures has highlighted the fact that visual, tactile and kinesthetic feedbacks are equally important in the shape creation and evaluation

process. The skilled hand motions performed by the modelers allow for a precise creation of the shape; the tactile interaction with the object helps in comparing adequacy of the physical prototype with the drawings, in providing early clues about shape features, and in improving the 3D mental representation of the shape.

The analysis of the acquired data has lead to the identification and classification of the tools used (manual tools, machines) and of the gestures and hand motions performed (for shaping the object, for feeling the surface quality, etc.). From this analysis we have pointed out the most recurrent, common and effective users' operations: *scraping, surface quality testing and finishing*. Scraping is usually performed using rakes, surface quality check using hands directly and surface finishing using sandpaper. The T'nD system offers tools and modalities for performing the same operations, in a digital environment.

4. T'nD system

This section describes in detail the T'nD haptic modelling system that we have developed (Cugini and Bordegoni 2007). The system has been designed considering the following three main requirements:

- the system should provide haptic tools and modeling operators for scraping, finishing a surface and for checking its quality;
- the system is oriented to the creation of industrial design models, therefore it should support the generation of high quality class-A surfaces;
- the system should render at real-time forces that simulate contact and force response with plastic materials like clay.

According to the first requirement, the system provides an interface that allows designers to interact haptically and graphically with virtual models of products including a true size car body. An extended version of the FCS-HapticMaster system (HapticMaster) is used since it is the most appropriate hardware solution for the project. In fact, the device provides an adequate workspace and rendered force (250 N). Within the context of the project, the FCS-HapticMaster is used as basic platform equipped with a strong and stiff 6 DOF device carrying simulated clay modeling tools.

For what concerns the mathematical model of shapes, approximated models do not satisfy the second requirement concerning high precision representation of the created shape. Therefore, a technique has been developed based on a tessellated model representation used during the material removal operations, and operators based on generic sweeping motions of profiles applied at the end of the removal operation in order to compute a precise high-quality surface (class-A surface).

Finally, the system is required to compute and render the geometric and haptic model of the sculptured object in real-time. Virtual objects must behave credibly, and interaction must take place in real-time. Therefore, the system is able to simulate properties and behaviors and at the same time satisfy the real-time constraints. The physics-based model computes and renders the forces in accordance to the type of plastic material simulated, on the basis of the well-known theory of chip removal (Merchant 1944).

The system is equipped with two haptic interfaces: a tool for shape modeling that resembles a rake and a tool for shape evaluation that resembles a piece of paper that adjusts to the object shape. The two tools are described in the following sections.

4.1 Tool for shape modeling

On the basis of the system specifications as previously described, a system prototype has been built. The setup of the prototype consists of the scraping haptic tool driven by two integrated FCS-HapticMaster systems (HapticMaster), and a monitor showing the object virtual model (Figure 2). The tool consists of a strip made of metal, which is typically handled by the user by gripping it between the thumb and fingers in two places, with both hands. Movement and force feedback on the tool is needed in at least all the 3 translational degrees of freedom that a body has: fore-aft, left-right, and up-down. The workspace provided is on the order of the reach of the human arm, or the size of a quarter of a 40% car model. Tool forces presented to the user when moving free of the virtual clay surface are as light as possible. The forces to feed back to the user are computed on the basis of the geometrical data provided by the detection of the collision between the object model and the virtual model of the rake. The resistance of the tool perceived by the user is the same as using the actual physical tool on real clay.

The user handles the haptic tool with two hands like in reality during the use of a scraping tool, and moves it for removing material. When the haptic tool gets in contact with the virtual object, it gives back the user a haptic feedback. The user can set the geometrical profile of the virtual rake and remove material from the virtual object just with one or a couple of strokes.

4.2 Tool for shape evaluation

The second tool allows the simulation of a piece of sandpaper, where its curvature actually follows the curvature of the virtual surface being explored (Figure 3). A piece of sandpaper, or rather the underlying surface of the work piece contacted, has curvature in addition to orientation. Our system is limited to the G2 curvature, which is the degree of "roundness" of the surface. In order to implement that, the device consists of a structure made of flexible spokes providing double curvature to the patch, which is covered with a piece of elastic material. If we consider that the user's hand relatively large in relation to the radii of curvature of the surface under exploration, and if the curvature of the surface is changing rapidly, then the users may well extract a cue about the nature of the surface, from the longitudinal changing of the curvature under the moving hand, i.e. by feeling the travelling bumps passing under the hand. The rotational workspace of the tool is the same as that of the human hand; it is usually limited to ± 30° in fore-aft tilt relative to the human arm, but the freedom in roll is at least 120°.

The tool is easily manipulated by the user who is free to move and rotate it around the three axes. During the haptic exploration, the system also renders the surface using the reflection lines modality. In this way, the user can better evaluate the quality of the surface by looking at the kinds of the reflection lines, and also by touching the surface. Using the system the quality of the surface can be checked, and the surface can be modified applying a sanding operator that removes very thin layers of material as the sandpaper does.

4.3 Users' evaluation

The idea of using a haptic tool for modeling shapes in the industrial design field is quite new. Therefore, it has been considered very important testing the concepts and interaction modalities proposed with designers.

Ten participants (designers, modelers and CAD engineers) took part in the evaluation sessions. None of the participants reported previous experience with haptic interfaces. After practicing with the system for about 10 minutes, they started modeling a given objects (a laptop cover) using the system. At the end of the sessions, that lasted about one hour each, the participants were asked to compile a questionnaire. The analysis of the testing sessions and the testers' answers to the questionnaire is hereafter reported:

- *general impression about the system.* All the testers where very positive about the concept and the system. They demonstrated a great interest in the haptic interface

and in its potential evolutions. In addition, they considered the proposed way of working very effective for creating new shapes. In conclusion, they think that the system introduces a new way for creating surfaces through sweep operations. This aspect is surely interesting and yet not existing as method for the generation of sweep surfaces in any CAD tool. From the users' point of view the generalised sweep approach fits very well with the concept of global shapes, which are thought of as an evolution of a curve along another line (trajectory) and can be realised through just one shot. More details about the evaluation results may be found on the project web site.

- *perceived usefulness of the system.* All the testers agree on the fact that the system is valuable for shape creation. At this stage, the system is suitable for rough shape creation more than for creating precise shapes. In general, all the testers have expressed the opinion that the system is a very helpful tool both for modelers and designers. They all seem quite positive about the possibility of integrating this new tool with other modeling tools within the design process.

- *effectiveness of the system.* All the testers agree in confirming the extreme intuitiveness of the scraping tool for creating shapes, also because of the intrinsic naturalness of the hand gesture. An important achievement to be noted is that all participants considered the motion they were making and the forces implied of extreme good quality, and fully similar to the ones occurring in physical clay model making. The testers reported some initial perception problems mainly due to parallax of the eye and hand working spaces. These problems have been solved in the new version of the system.

5. Discussion and Conclusions

The paper has presented a modeling system that allows stylists first to generate digital shapes in a natural and intuitive way by manipulating a haptic tool that closely resembles a physical rake, and then to evaluate the created shape with an additional haptic tool allowing the exploration of surfaces.

The research described aimed at providing stylists and designers a system that improves usability of current design systems and that also allows them to create and evaluate the conceptual models of their products not only through vision but also by means of touch. The system has been tested by a set of designers who have considered the interaction provided by the system and the way of working very effective and close to their real way of operating.

For what concerns the product design process, the obtained benefits are several. The global design cycle is shorten due to the fact that a high quality mathematical digital model is created directly and precisely by the stylist through few gestures, the quality of products is improved due to the fact that more variants may be designed and validated within the available time, and also the number of physical prototypes diminish towards a more economic, ecological and also social sustainable future, since physical mock-ups require material to be produced, and also tools for manufacturing them, as well as energy and the use of means of transportation, and in addition are not durable and seldom re-usable, and so need to be recycled or dismantled.

The limitation of the current implementation of the system, as reported by the users during the evaluation sessions, concerns ergonomics aspects of the system setup mainly related to parallax of eyes and hands working spaces. In fact, the space where the user sees the object and the space where he operates on the haptic interface for creating and exploring the shapes are not co-located. This problem has been addressed in a new research project named SATIN (http://www.satin-project.eu) where the system layout has been designed so as to offer a precise coincidence of the visual and hand operational working spaces so as to improve usability and ergonomics issues.

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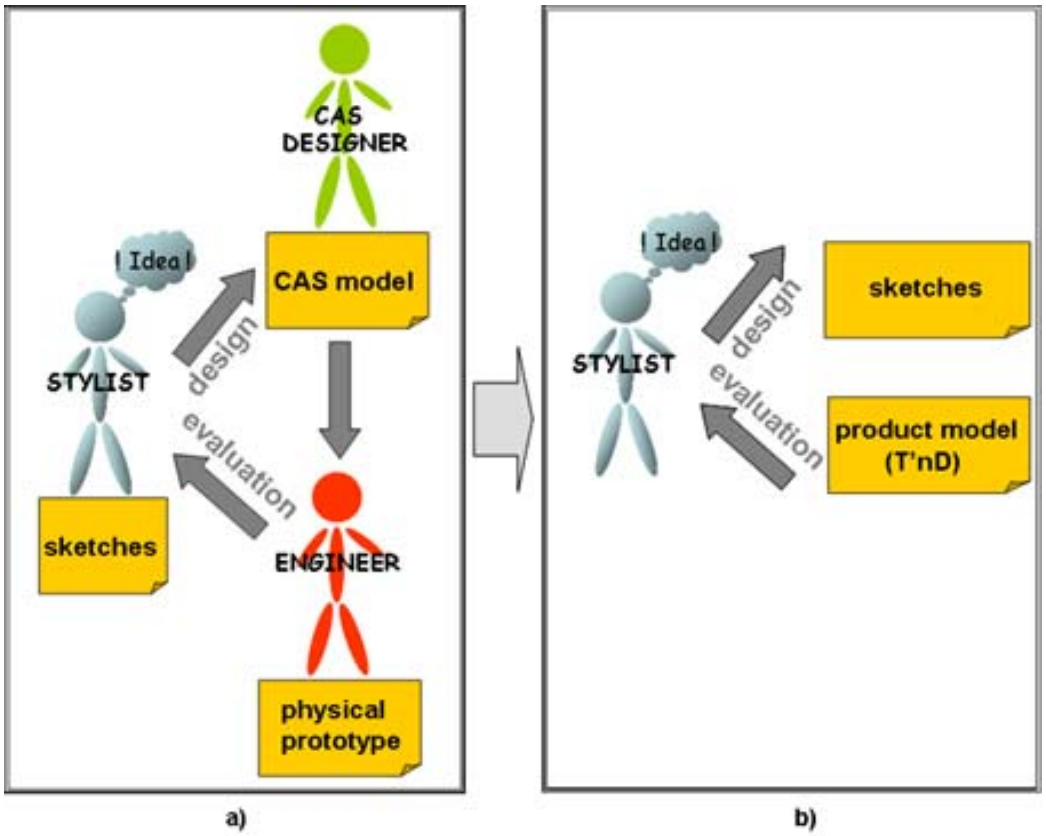

Fig. 1: Product design and evaluation process. a) typical process loop involving stylists, CAS designers and engineers; b) new process based on T'nD system where shape creation and evaluation can be performed by the stylist himself.

Fig. 2: Use of the haptic tool resembling a real rake for modeling a virtual car. The user uses the haptic rake for removing layers of virtual material and feels a force feedback when entering in contact with the virtual surface.

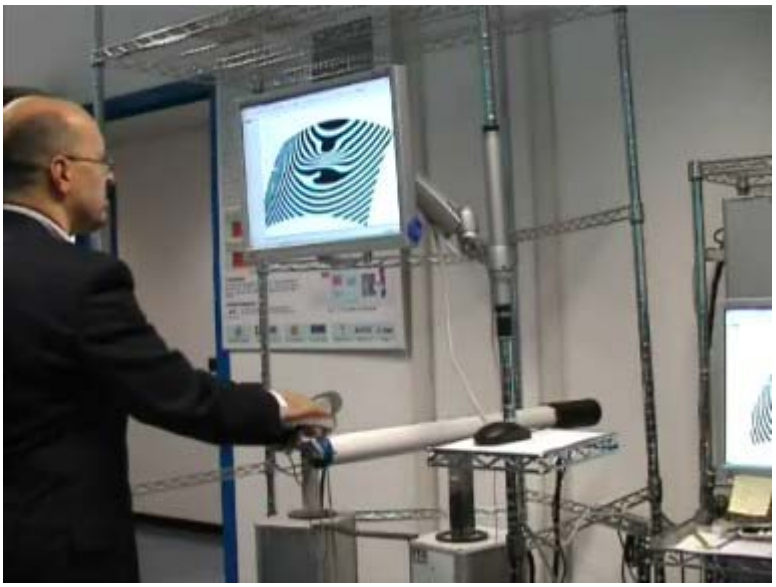

Fig. 3: A designer uses the haptic tool for exploring and finishing the object surface. The tool is easily manipulated by the user who is free to move and rotate it around the three axes.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design for Social and Environmental Enterprise

Design at the Service of Social Businesses

Clare Brass[1], Flora Bowden[2]

Abstract

SEED Foundation undertakes academic and action research to develop new, innovative ways for design to most effectively contribute towards sustainable development. By aligning current political goals with cutting edge design thinking and good business sense, this paper presents our ideas on how more designers can profitably solve social and environmental problems through their work.

It specifically investigates how the still emerging discipline of service design, in dealing more with relationships and experiences than material objects, offers inherent social and environmental benefits and is naturally transferable to sectors broader than private business –where designers traditionally work. By working in public and third sectors, and especially with social businesses, this paper uncovers new roles and business models for comprehensively sustainable design practice.

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Introduction

Design is about people and solving problems. Products, services and systems that are well designed are easier to use, more visible, more desirable and more sustainable. Since the industrial revolution began, design has been used as a tool to meet specific economic challenges for businesses, to increase growth, improve market share and boost financial gain. The UK Design Council came into existence at the end of WW2 to help get Britain back on its feet by promoting the value British made goods. The 1946 exhibition 'Britain Can Make It' was created to show 'the improvement of design in the products of British industry (Design Council 2007). This operation played an important part in driving post-war economic recovery and set the scene for the way the design profession would evolve.

But as the UK has shifted to a service-based economy, competitive advantage has moved away from product alone to incorporate brand and brand experience[3]. Businesses are now beginning to employ designers to improve the quality of their service offering and the way they connect with their customers. Service design is a growing phenomenon, which looks closely at the way people do things, reframing problems accordingly to fulfil people's needs through new, easier and more desirable experiences. In this new guise, designers are helping businesses devise strategies for customer interaction rather than just being brought in to design more 'stuff'.

This ability to deal with behaviours and relationships and to find attractive alternatives to physical objects has an added and largely unintended environmental benefit. Research on sustainable design identifies a shift to services as a potentially powerful tool for reducing the environmental impact of this industry. According to the sustainable design network, Sus-pro-net, "Companies should switch their focus to [offering] a mix of tangible products and intangible services, designed and combined to jointly fulfil a user's needs" (Suspronet 2004).

Aims

This paper aims to uncover how the current strengths and nascent trends in the design industry can be best employed to achieve the goals of sustinable development. It will

- investigate how and why service design is well-placed to drive innovation in public services, the third sector and particularly, social enterprise; and why it could therefore be an invaluable tool for sustainable development

- uncover the obstacles that prevent mainstream designers earning their living from solving social and environmental problems and identify the entrepreneurial skills and new ways of working required to overcome them

- and present SEED Foundation's new design-led social enterprise that will put the theses and methodologies discussed, into practice

[3] Green communication group Better Thinking describe a history of consumption in which competitive advantage used to be based on product, then on brand. 'The next step' says the company's director Mike Betts 'is that businesses will be valued on their behaviour and will have to provide transparency in order to maintain customer loyalty.

In our current economic model, businesses that sell products measure their success in turnover of units. A service model removes this dependency and can be equally if not more successful. In 2001 Electrolux piloted a project to test this thinking with a group of consumers in Gotland, Sweden: instead of selling washing machines (product), they supplied the machine free. Each wash was then paid for through the electricity bill, an action that required building a new relationship between these two disparate types of stakeholders. The problem was redefined as one of fulfilling a user need – that of getting clean clothes (service). Over the lifetime of the machine, this model generates a higher turnover than just selling products. Since Electrolux would retain ownership of the machine, they would also have greater incentive to design it to be easily repaired and to last longer. In addition, the company would this way be involved in the end-of-life of the machine and can remanufacture it or recycle its materials (UNEP 2005). There is an added benefit in user behaviour change, since paying per wash will likely make customers wash less, with a consequent saving of water and washing powder.

The United Nations Environment Programme believes that the integrated working of stakeholders is a great advantage of service design, the real key to unlocking environmental benefits (UNEP 2005). Britain, with its strong service industry, has pioneering service designers, putting it in an excellent position to generate new sustainable service models.

So although all projects that pass through the offices of a service designer do not necessarily have an environmental objective, this might be a suitable destination for that growing group of designers who are concerned about the impact of their professional practice.

Service designers are exploring the value of the Internet as a means to successfully accessing services. London-based design studio LiveWork developed the systems and interfaces of Streetcar, a flexible car-hire service. Subscribers to Streetcar can rent a car on an hourly or daily basis, finding the nearest available car through a simple online tool. With the potential to be cheaper and less bothersome than car ownership, it affords people the mobility of a private vehicle, ultimately reducing the number of cars on the road. The importance of design in this model is making an interface that is so simple and intuitive to use that this different means of private transportation can be as attractive and easy as owning your own car.

Designing Beyond the Private Sector

By designing for people’s experiences, interactions and behaviour, designers are developing skills and techniques that are not only well suited to the services of business, but that are also easily transferable to public services. By applying their service design skills to the public sector, designers are able to broach a new set of challenges and opportunities, applying strategic innovation to problems of systems, infrastructures and relationships that are rarely demanded of them in the private sector.

Through this methodology the former RED Unit at the UK Design Council was able to tackle a broad range of diverse problems relating to issues such as the prison service, domestic energy consumption and MP’s relation to their constituents. Hilary Cottam, who was awarded the Designer of the Year Prize in 2005 for this work, went on to form Participle, a multi-disciplinary design group further trialling the use of design in working with public services.

A new generation of young designers is experimenting with how they can support and improve public services. ThinkPublic, for example is using design to help the National Health Service build an emergency service that is better suited to the needs of today’s young people. Zest Innovation is working with Northumbria University to help them with their recruitment

strategies, exploring ways of promoting careers in design to school-age students. New communication tools are in development, that are more engaging for this target audience.

Further examples of design's reach into new realms came through the Dott07 initiative, funded by the North East of England, where social and environmental improvement was the key objective. Various projects explored how design can improve quality of life and wellbeing, involving local people in finding better and more sustainable solutions to their daily problems, such as how to get children in remote areas to school without dependency on a car (Move Me, Dott07 2007), or how to help low-income families cut carbon emissions through insulating their homes (Low Carb Lane, Dott07 2007).

The co-designed solutions that emerged were both innovative and unexpected: designers working with parents of children in remote schools came up with a spread sheet in the school entrance for more effective car sharing, as well as the re-design of the local bus timetables for easier use; the solution for people in low-income homes was a financial package, brokered between energy providers and banks, to enable insulating home improvements to be paid for through savings on fuel bills.

These projects illustrate that, when tackling the complex challenges of sustainable development, the designer can become a connector between multiple stakeholders, teasing out issues and finding common values. Here, where the re-design of systems and services become critical to making profound and lasting sustainable change, service design offers a number of valuable processes. Visual communication, mapping and user-centred design techniques make it possible to examine the journeys of different users through any given service, tapping into their needs, and understanding how their connected problems can turn into possible symbioses, reducing dependency on physical objects and finding new ways of effectively and enjoyably collaborating.

Recent research for the Design Council (Brass, Bowden & Moseley 2007) enabled us to overlay some of this burgeoning design thinking with some of the broader aims of the UK government's sustainable development strategy, Securing the Future, whose stated aims include the creation of "…sustainable communities that embody the principles of sustainable development at the local level. This will involve working to give communities more power and say in the decisions that affect them; and working in partnership at the right level to get things done" (Defra 2005, 17) We concluded that service design could make valuable contributions to these objectives, but it is still in its early stages. It exists predominantly in demonstration projects such as Dott07 or in academic research, whose operations are not conceived as businesses and therefore have no self-sufficiency, remaining inaccessible to mainstream design. In the face of the current environmental crisis, enabling designers to tackle the critical issues of behaviour, systems and infrastructure using the methodology described above, could have powerful results, but this will never be possible until it becomes a recognised path on which designers can forge their profession and their livelihoods.

Outside of design there is another area of business that is generating profit from social and environmental problems: social enterprises are profit-making businesses which trade in goods or services for a social or environmental purpose. Whereas conventional businesses distribute their profit among shareholders, in social enterprises the surplus goes towards one or more social aims of the business. Well known social enterprises include The Big Issue, Cafedirect and Welsh Water.

Three common characteristics of social enterprises as defined by Social Enterprise London are:

- Enterprise orientation: They are directly involved in producing goods or providing services to a market. They seek to be viable trading organisations, with an operating surplus.
- Social Aims: They have explicit social aims such as job creation, training or the provision of local services. They have ethical values including a commitment to

local capacity building, and they are accountable to their members and the wider community for their social environmental and economic impact.

- Social ownership: They are autonomous organisations with governance and ownership structures based on participation by stakeholder groups (users or clients, local community groups etc.) or by trustees. Profits are distributed as profit sharing to stakeholders or used for the benefit of the community.

Design Council research (Design Index 2008), which followed share prices of a group of more than 150 companies recognised as effective users of design between 1994 and 2003, proved that design can boost the success of private business: they out-performed the stock market by 200 per cent. We believe that if this power of design were applied to social and environmental enterprises, it would propel them to a new level. We can see a potential for social enterprises to compete with regular business services while actually resolving one or more social or environmental issues in the process. Our premise is that problems are opportunities, and equipping the design sector to think more entrepreneurially and across disciplines would unleash design's benefits on a whole range of social and environmental problems.

We think there are two principle ways for designers to engage in this field: to support existing social enterprises, or to use their entrepreneurial skills to build new partnerships and social enterprises themselves.

A new model is needed to open the doors to the growing number of designers who wish to apply their skills and time to resolving social and environmental challenges, one which enables them to make money out of working towards these goals. Helping designers to be more entrepreneurial about their practice and develop new skills to design systems and services along with strong supporting business models, could turn them from perpetuators of social and environmental problems, into key contributors to solving them.

We believe sustainability should be as much about creating communities and jobs to enhance life as it is about environmental stewardship. To test our ideas and to develop methodology we will build a series of design-led social enterprises over the coming years. These will be based on a set of principles, on which we believe the design profession needs to focus:

1. Infrastructure

Up to now, where design thinking has been applied to environmental and social problems, it has tended to be in the realm of product design and around the familiar refrain 'reduce, reuse, recycle'.

Design's role in sustainable development must not be just about the objects themselves, but about what surrounds them. While looking at products and the way they are designed is important, doing so without considering the infrastructure that supports them and the behaviour of the people who use them is meaningless.

To many people, infrastructure is the most unfamiliar territory for design activity because it moves furthest from design's traditional role of creating objects. It seems rather to be the preserve of disciplines such as finance, politics or engineering. Designers are now challenging this, showing that their skills can be of enormous practical value. This is not a matter of supplanting other areas of expertise, but co-ordinating discussion between them, visualising problems and possibilities, prototyping solutions and putting the focus on end users to ensure real needs are met. It is about design navigating and managing complex networks of interdependent factors quickly and cheaply. It is also about design promoting adoption of new behaviour by making it desirable.

‘To bring the issues of sustainable consumption alive…people need to see symbolic effective solutions in their everyday lives. The effects of these interventions ripple outwards by opening people’s minds to ways of doing things differently’ (Sustainable Development Commission 2005, 109)

Most of the effects of our use of infrastructure are invisible to us. Research has shown that making the effects of people’s actions visible can significantly change their behaviour (Abrams, 2006). Design can filter and visualise this information, present it clearly and immediately and put it where it will be most relevant and visible.

Without thought for the systems that deliver an object to us, power it through its life and dispose of it when it is no longer useful, the environmental credentials of the materials and production processes are more or less nullified. Simply making material adjustments does nothing to alter the human behaviour that is really at the heart of the issue. This is the new space in which designers must learn to operate.

2. Interconnectivity

It is not enough to deal with the problems of sustainable development at face value or in isolation. What we need are solutions that can visualise the context in its entirety and deal directly with the root of problems, ideally eliminating the risk of recurrence.

Sustainable development is a multi-layered, complex network of interrelated challenges and design solutions must approach it accordingly. Designers must appreciate this interconnectivity and tackle the problems holistically to avoid unwittingly shifting them elsewhere.

Plastic bags are the face of one such issue that has been much debated and tackled by designers, legislators and whole communities alike. Capping their free distribution or swapping plastic for more ‘environmentally friendly’ materials might create a new problem while worthily trying to solve the old one. The unforeseen consequence of taxing plastic bags in Ireland was a 300-500% increase in the sale of plastic refuse bags and bin liners (Carrier Bag Consortium). Through this we can understand that the problem of plastic bags is intrinsically linked to the problem of waste disposal at home – if the systems were in place to make it easier to correctly separate wet waste from dry, there would be no need to line the dustbin.

This kind of analysis also expands the realm of possible stakeholders (e.g. retailers, local waste and planning authorities, household goods manufacturers etc) to consider who else might contribute to the solution, leading us to the conclusion that emerging design disciplines must consider cross-disciplinary and cross-sector collaboration. The complex nature of sustainability means the different groups of society must be brought together in coordinated action in order to achieve accelerated change.

3. Business, government and people

Each of these three sectors of society recognises that they need to change but UK Government research describes a gridlock of inaction between them, showing that they are unwilling to act in isolation (Sustainable Development Commission 2005). Each is wary of the other and each is reluctant to make a move without the assurance that the others will follow. Sustainable development issues clearly hinge on all these groups in numerous ways and it is this complex system of relationships that a product-design focused approach misses.

Advanced design thinking increasingly recognises the need to address relationships rather than deal with isolated objects. It examines the connections between things, the

infrastructure that supports them and the people who use both. This will require implementing strategies and initiatives that touch the issues on many different levels. For projects to be successful they must work with all sectors together, to unlock the gridlock and facilitate change.

To return to the example of the supermarket plastic bag, its network of relationships takes in government waste targets, consumer behaviour beyond the shopping trip (since the bags are re-used), and the interests of a number of businesses. A creative design approach to the problem would co-ordinate the needs of all these groups to come up with really effective and, perhaps counter-intuitive solutions.

Sustainability is an overwhelmingly social problem and design's great strength in approaching it would be a focus on end users, whether from business, government, the general populace or all three. A user-centred approach engages all interest groups and encourages their active participation in the design process. For organisations of any sort whose primary objective is to engage communities, there can be few more effective methods of tackling the problem head-on.

Enterprise 1: HiRise Gardens

HiRise Gardens is a social enterprise that touches on issues of biodegradable waste, homelessness, locally grown food, community cohesion and biodiversity. It offers local authorities a turnkey system to deal with biodegradable waste, using the skills of a particular group of unemployed housing estate residents to manage a community composting system that will create a number of spin-off benefits.

The demand for HiRise Gardens stems from the increasing pressure on local councils to reduce the quantities of biodegradable municipal waste they send to landfill under the EU Landfill Directive. As of 2009/10, they will face heavy financial penalties for disposing of waste beyond their allocation. Local councils are developing new ways of dealing with biodegradable waste, such as differentiated or fortnightly collections. But such operations are largely written off in blocks of flats, where any kind of waste separation is logistically complicated and requires significant changes in behaviour.

Given the proportion of flat-dwellers in the UK's inner-city fabric and the failure to design infrastructure fitting to these demographic requirements, this represents a huge loss to local Councils. In fact, in the London borough where we intend to run a pilot for HiRise Gardens, flats constituted about half the properties – half the potential waste savings in this case are consequently lost.

Successfully removing biodegradable waste from blocks of flats is ultimately a connectivity issue that depends on the creation of systems that will help residents understand the issues and inspire them to deal with their waste differently. Former local councillor Stuart Singleton-White, talking about the problems of waste minimisation in Peterborough, indicates the current failings: '…the root of these problems lies in the disconnect between those local politicians and members of the community, coupled with very poor communications skills for both the politicians themselves and from the PR teams of the respective council: a clear lack of creativity here often results in exciting opportunities being lost and failing to excite: cases failing to be made and policies developed in isolation.' (Jonathan Porritt's blog, comment posted 1 June 2007)

By mapping out the common problems of dense urban environments, we were able to visualise the needs of different groups of individuals and find their complementary symbioses. A series of maps helped us identify the key players in private and public waste creation and management, the individual issues of each and how they might help each other. Finally

through these maps we were able to highlight the areas where design's intervention might be most effective. (See plates 1-4 annex)

One of the clearest links that emerged through the mapping process was the potential of joining up the problems relating to biodegradable waste with those of homelessness. When we contacted the London-based organisation, Thames Reach, whose mission is to reintegrate homeless people into work and society, we discovered they currently support 550 individuals already on the path to re-integration in our sample borough. These 'service users' are accommodated in the very Council estates that are the focus of our proposal for the borough's waste problem. In this environment they are often seen as something of a blight, largely unemployed and around 50% with alcohol-dependency issues (Rough Sleepers Unit 1999). In fact one of the biggest challenges that face these service users is gaining regular and dignified employment: when surveyed in 2007, about 79% said they would like to work, but currently only 10% are actually employed (Thames Reach 2007). This huge discrepancy seems to be partly caused by over-expectations of their working capabilities, as well as a prevailing situation where anything less than fulltime work (often difficult to cope with initially) could well leave them worse off than being on benefits.

This poses another problem for the Council, as the cost of having many economically inactive residents on estates can be substantial. It can lead to neighbourhoods becoming run down as people have little disposable income and a lot of time on their hands, sometimes leading to anti-social behaviour. Furthermore for central government they represent a cost in terms of benefits payments, and lost revenue in tax and rent. Therefore providing manageable and respectable jobs to the formerly homeless in a way that brings them closer to their communities while improving the local environment and providing a valuable service, offers multiple benefits.

Our first task was to build a business case to prove the social, environmental and economic advantages of joining up these problems.

The Business Case

The UK has one of the worst recycling rates in Europe. Only Greece sends more waste per capita to landfill (Eurostats 2005).

Furthermore, an estimated 68% of municipal waste is biodegradable (Defra 2007), and about a third of all food bought is thrown away (WRAP 2008). An estimated 2% of the UK's greenhouse gas emissions come from the production of methane from material biodegrading anaerobically in landfill (Let's Recycle).

Landfill, once an easy way to dispose of our increasing waste streams, is getting more scarce and expensive, with gate fees and government taxes increasing. Legislation is forcing private and public waste management bodies to look for alternative means of disposal. These include anaerobic digestion and EfW (Energy from Waste) plants, both of which require substantial capital investment and use existing models and infrastructure with some shifts in the way waste is collected and treated. Whatever the disposal system, there is still a need to address the way individual householders perceive and manage their waste streams.

Our business model is based on Councils' paying HiRise Gardens to reduce the amount of BMW tonnages to landfill. By putting systems in place now we are preparing Councils to not only save money on landfill tax and potential fines but to generate income from the sale of landfill allowance credits. On top of that, we expect to generate income from waste collection beyond the estate as well as substantial revenue from cultivating seedlings and selling mini-gardens for urban vegetable growing.

Waste Infrastructure

Like many other systems that we depend on, waste management is for most of us invisible. We play no part in it beyond our doorsteps, making it easy for us to forget about it and its consequences. But getting people to participate in recycling schemes can be challenging.

The system we are developing provides every household in a housing estate with a bin to separate food waste, and an on-site community composting machine that transforms it from waste into compost. The compost can then be used for localised landscaping of the estate's public spaces and for nurturing fruit and vegetable seedlings, some of which will be returned to the estate, the rest sold. In current world demographics, where for the first time, over half the global population is living in urban areas, with a consequential loss of contact with nature and natural cycles; we believe the introduction of edible plant life into Council estates is a powerful learning tool that will help people understand the loop in which food can grow from food waste.

The time is ripe for this kind of intervention: across the world there are numerous indications of urbanites' desire to reconnect with nature and improve the experience of food and eating. Political pressure led to the exploitation of Havana's urban landscapes for food production, which now provide over 60% of the city's food (Viljoen and Bohn 2005); in the UK, allotment space is increasingly in demand, and for the first time, last year the sale of edible seeds exceeded that of flowers (Horticultural Trades Association 2008). Communities are mobilising to improve their green spaces, such as shown by the underground Guerrilla Gardeners; and the cultivation of a vegetable garden in the Anderson Shelter in St. James' Park, right in front of Buckingham Palace (Dig for Victory: War on Waste 2008), is evidence of the food gardening renaissance reaching mainstream society.

The benefits to wellbeing of direct contact with soil and plants are proven in many areas of research; Thames Reach, our partner organisation for homelessness, already sends some service users to help out at a farm in Sussex as a therapeutic measure, leading to several users expressing a desire to relocate permanently.

The experiential learning of the residents close-up view of the transformation of their waste materials into a resource from which they can directly benefit, is more valuable than educational leaflets and fines, which offer no real understanding of the issues. We perceive the thousands of available linear acreages of housing estate balconies, walkways and communal spaces as prime locations to be exploited for the cultivation of food plants. This has the potential to be a multiple win situation: it would enhance the aesthetic quality of the spaces, giving residents daily experience of natural and growing cycles and hopefully providing some edible benefits too. We suspect that the constant presence of gardening and waste management staff on the walkways of the estates might have the added advantage of reducing delinquency.

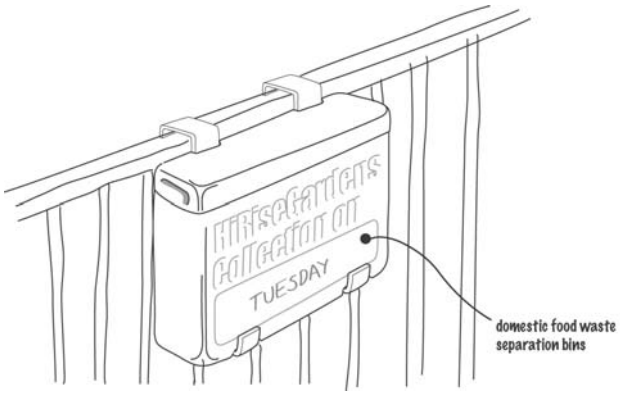
Beyond the estates, there are further business and social benefits to be had. Since commercial and public sector activities must pay extra for their waste collection, they could make savings if HiRise Gardens offered a more competitive rate than other waste companies for taking the biodegradable waste off their hands. Collection from these other sources, which might include hospitals, schools and restaurants, would also provide extra raw material for the composting machine and expand the staff's engagement with the wider community.

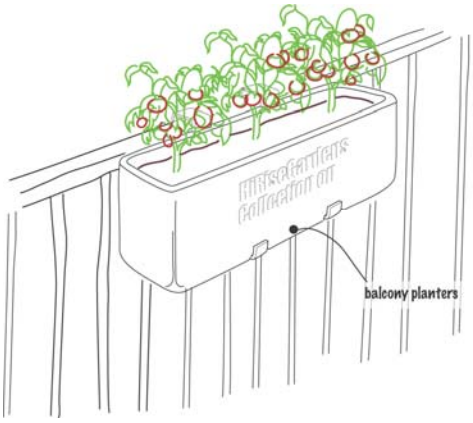
The Design Challenges

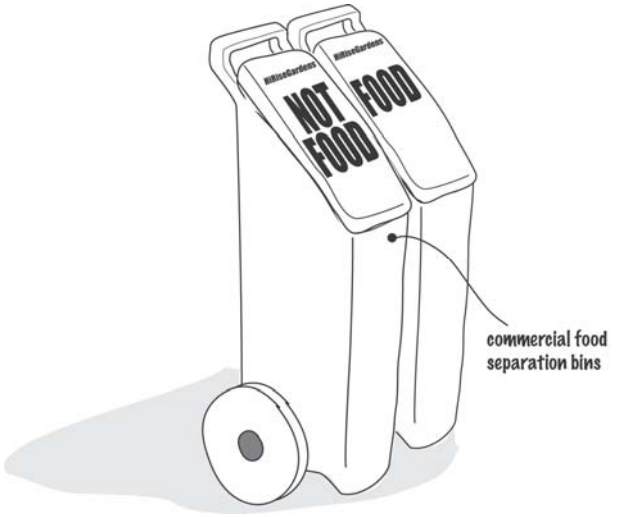
HiRise Gardens is a combination of products, services and systems that encompass a variety of design challenges for such issues as brand, product, service and communication. Our intention is to deliver HiRise Gardens with the maximum design capability at each step

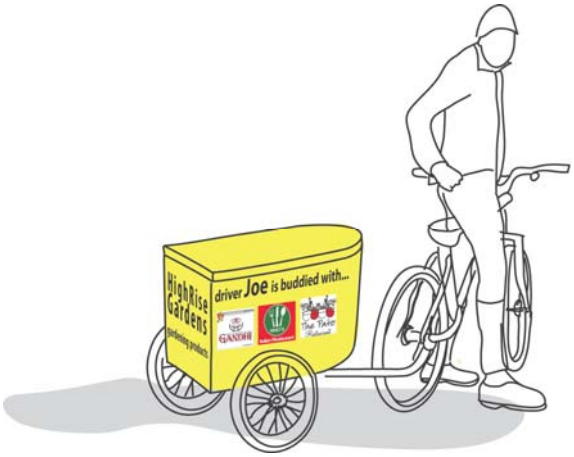
by tapping into the knowledge and expertise of other design professionals. We will be documenting our progress along the way to build cutting edge methodology to disseminate to the design industry.

For the creation of the physical products – which include domestic and commercial bins, window boxes and planter/propagators – we are working with gardening products manufacturer, Stewart Plastics, who will also be able to offer this range through its existing channels of distribution. We will also design a range of bikes and trailer accessories to allow employees to make easy and visible daily collections, of waste around the extended neighbourhood.





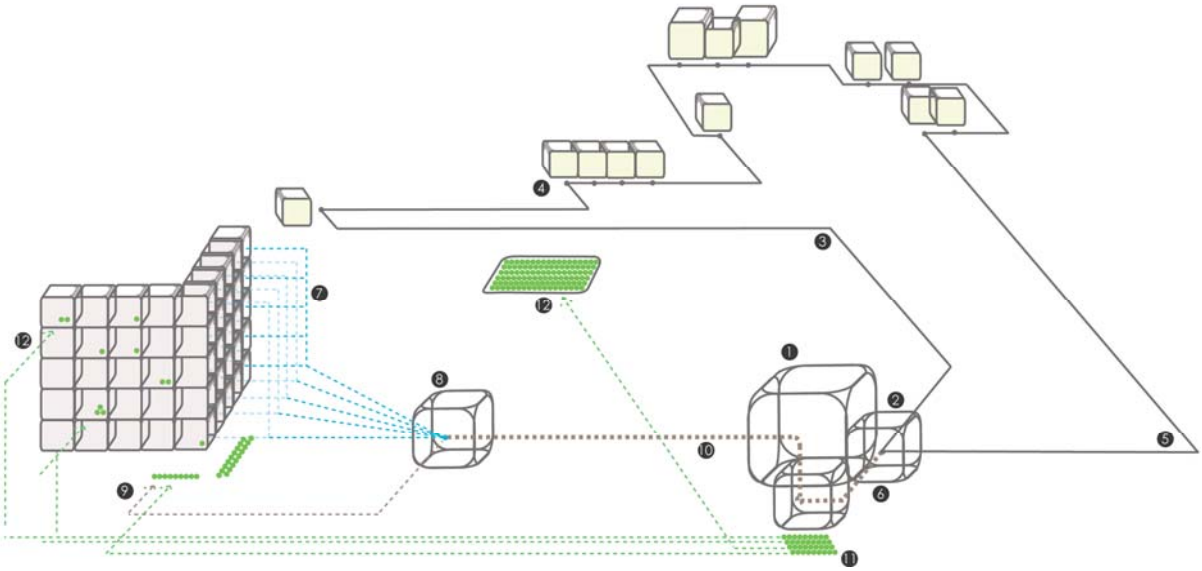




Brand expertise will be needed to build and maintain brand consistency throughout the organisation. This will ensure adhesion from within the organisation and without. There is a clear need to promote HiRise Garden's activities through excellent communication, which will also be important in selling the products and services that HiRise Gardens will offer.

System for External Collection

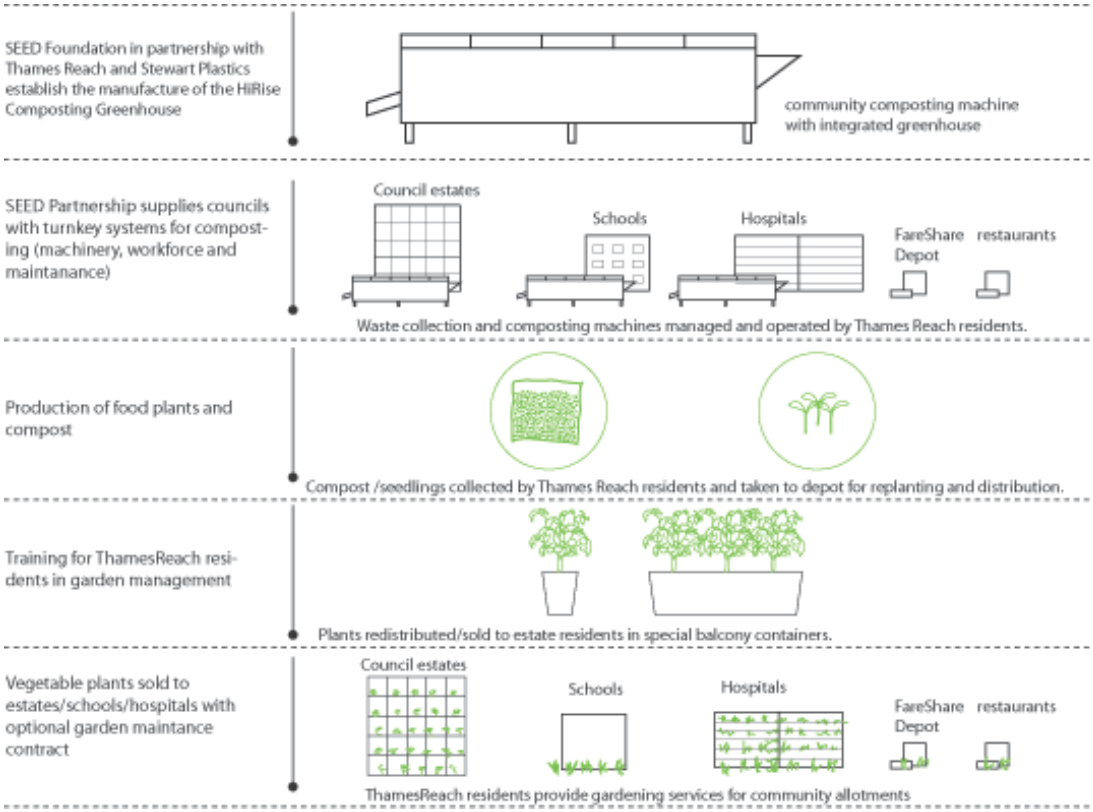
1. The shelter or day centre
2. Its on-site composting machine.
3. One of the members sets out on their route around a planned group of local restaurants or grocers etc.
4. All the food waste that they have separated out is collected.
5. With a full load, the rider returns to the day centre
6. where the food waste is processed and turned into rich compost.
7. At the same time, food waste from local flats is also collected.
8. It is then turned into compost in their on-site machine
9. Some of the compost is used in landscaping the building's grounds or is taken by residents if they want it.
10. The rest is collected by the shelter team.
11. The compost the shelter makes along with the excess compost it collects is bagged for sale or used to grow seedlings.
12. This can then be sold back to the community to green the tower blocks and public space.



Each of the various service aspects will need to be co-designed with the various stakeholder groups – Thames Reach service users, estate residents, external clients etc. We plan to run a number of workshops with each of these to get a better understanding of their various needs. For example, we currently have only an outsider's idea of what it means to have been homeless and to be striving to be once again a part of mainstream society. Working with Thames Reach users we hope to gain insights into what drives them, so that we are better equipped to gradually build up their working routine in a way that is both stimulating and satisfying without being over-demanding. Equally, the success of the operation will depend on striking a balance in the relationship between the service users and the other estate residents.

With them we must design a system that works according to each of their needs and desires, and also ensures their smooth interaction with each other. This co-design will influence the design of the tools for collecting and transporting food waste, the schedules for collections, the communication material and awareness-building aspects of the operation. An important design aspect will be in the building of the brand, which will hold the whole operation together and create an entity with which people will want to be associated, both from within the housing estate and beyond. It will be a means to communicate and build support for the operation in the wider community, important in the construction of a market for its gardening products and services.

The Collection System Diagram



Training

A well-designed training programme is another critical element of HiRise Gardens, which will bring with it further potential for public funding. As we have already mentioned, Thames Reach service users are at different levels of reintegration into mainstream society. Different levels of skills are required to make HiRise Gardens work. At the lowest level, employees must collect waste bins from outside each dwelling on a given day and transport the waste to the on-site machine. Basic training for operating the machine, which includes sifting through the food to filter out contaminants, controlling temperature and humidity and emptying and storing the compost produced, will be provided by the machine's manufacturer. The regular contact with the estate residents will be a valuable opportunity for the staff to interact with their neighbours, building relationships and potentially playing a key role in connecting the community. Beyond the estate, as the collection extends to local businesses, some staff will venture further and hopefully build similar relationships in the commercial sector, broadening their future employment opportunities.

As the enterprise develops and HiRise Gardens operates on multiple estates across numerous boroughs, it will require a structured hierarchy and management teams to oversee its smooth-running. We want to offer the opportunity for professional progression within HiRise Gardens and anticipate that staff will be able to progress from the collection team to management, perhaps training new staff themselves.

Aside from the waste management, the other critical function of the enterprise is in cultivating and marketing seedlings as well as offering gardening and landscaping services, on the estate and beyond. Building on our experience of developing training programmes (Designing Demand 2006), we plan to create a combination of classroom-style teaching with practical mentor/student modules in which new employees are initially teamed-up with a more experienced partner, leading to a learning method that is effective because it is both experiential and strongly supportive.

Conclusion

We are planning to pilot HiRise Gardens over the next few months on a London housing estate, with the support of Thames Reach and grant funding from various sources. The piloting period will provide an opportunity to refine our offering through continued testing and prototyping. We will also need to design evaluation methods that are appropriate to the long-term, soft benefits we anticipate HiRise Gardens will create.

Our intention is for this enterprise to become a blueprint for a proliferation of profitable, community-based waste management operations to be scaled-up and rolled out to create widespread change - an aggregation of the local that moves the national.

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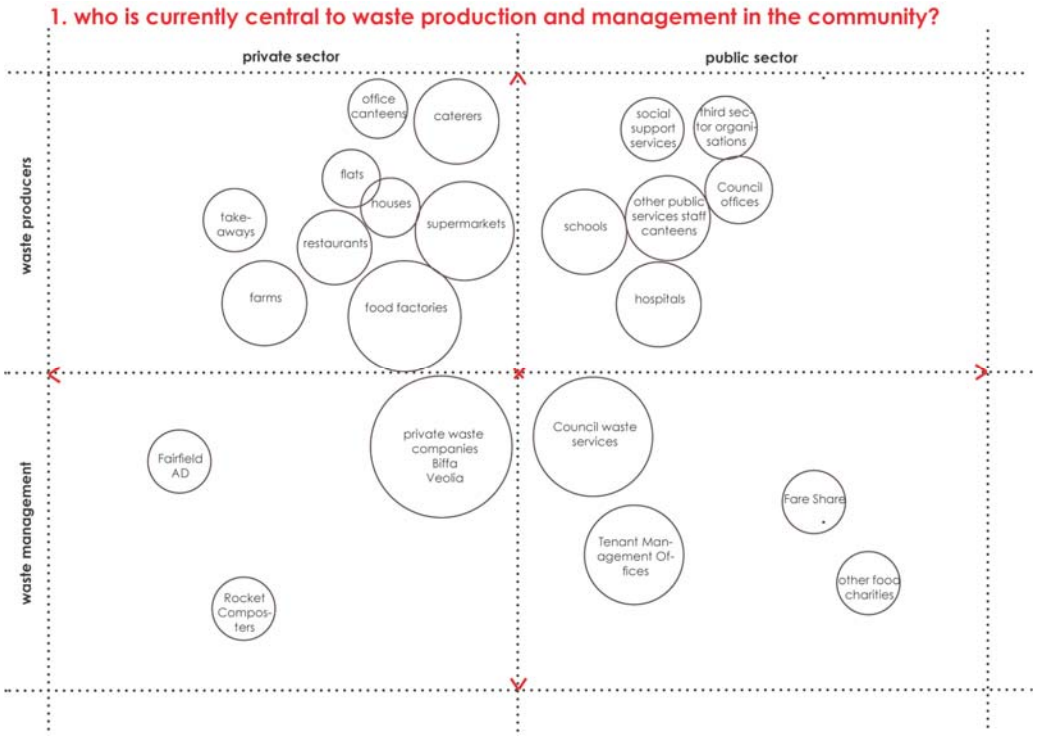
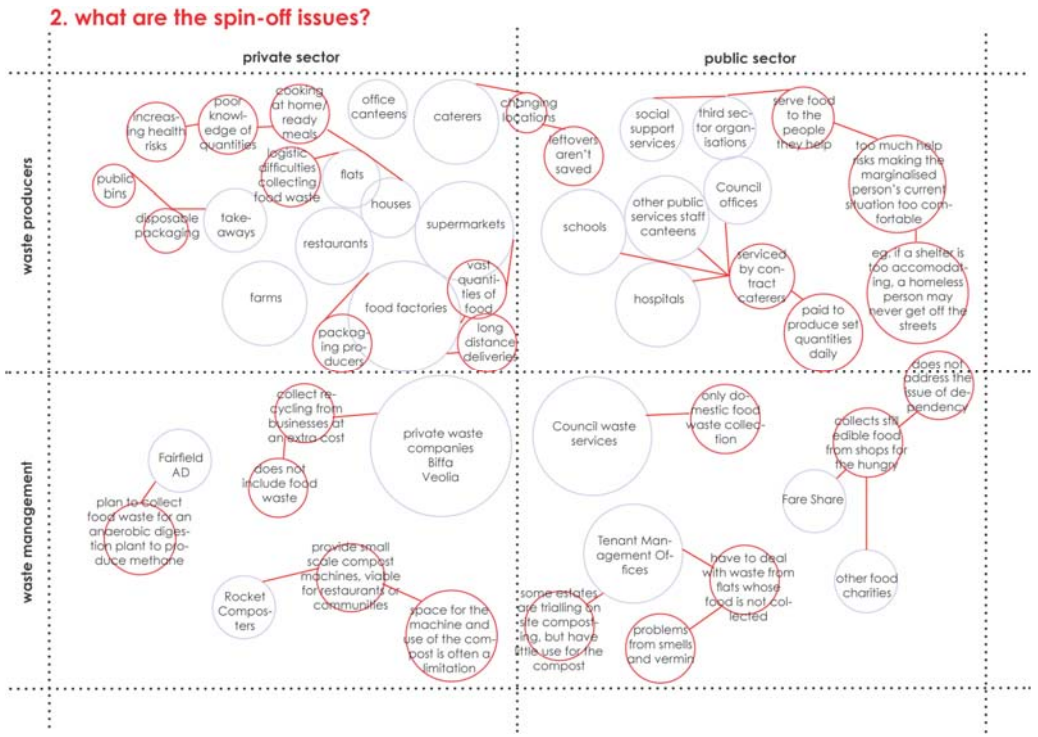
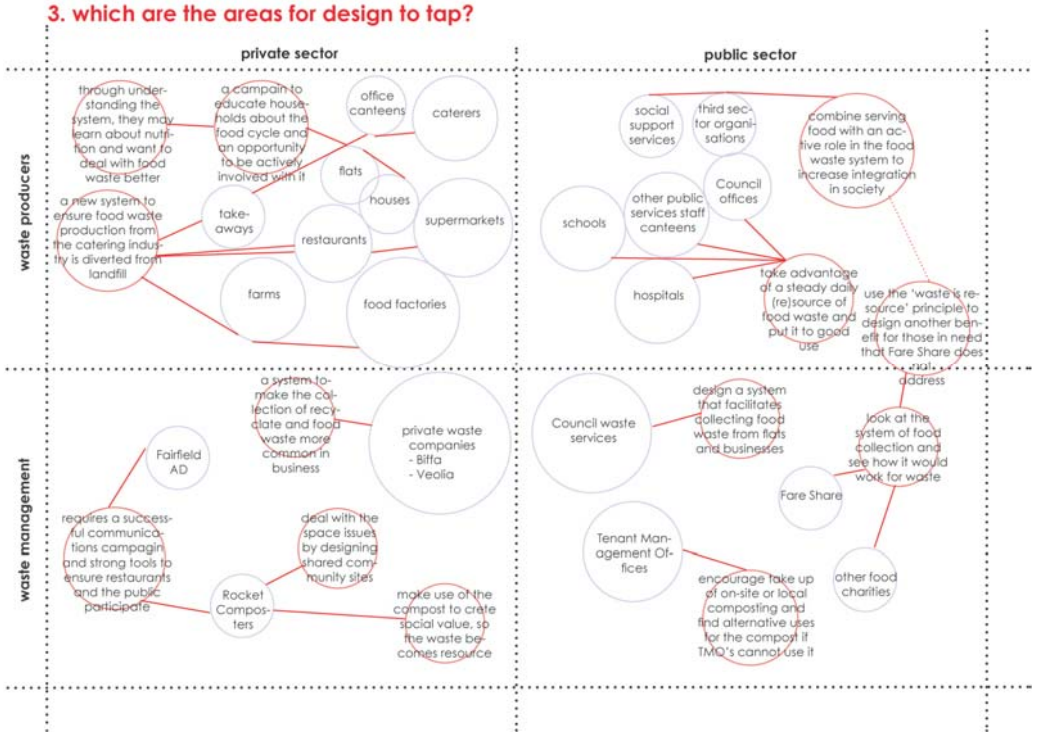
ANNEX 01 - plates 1-4

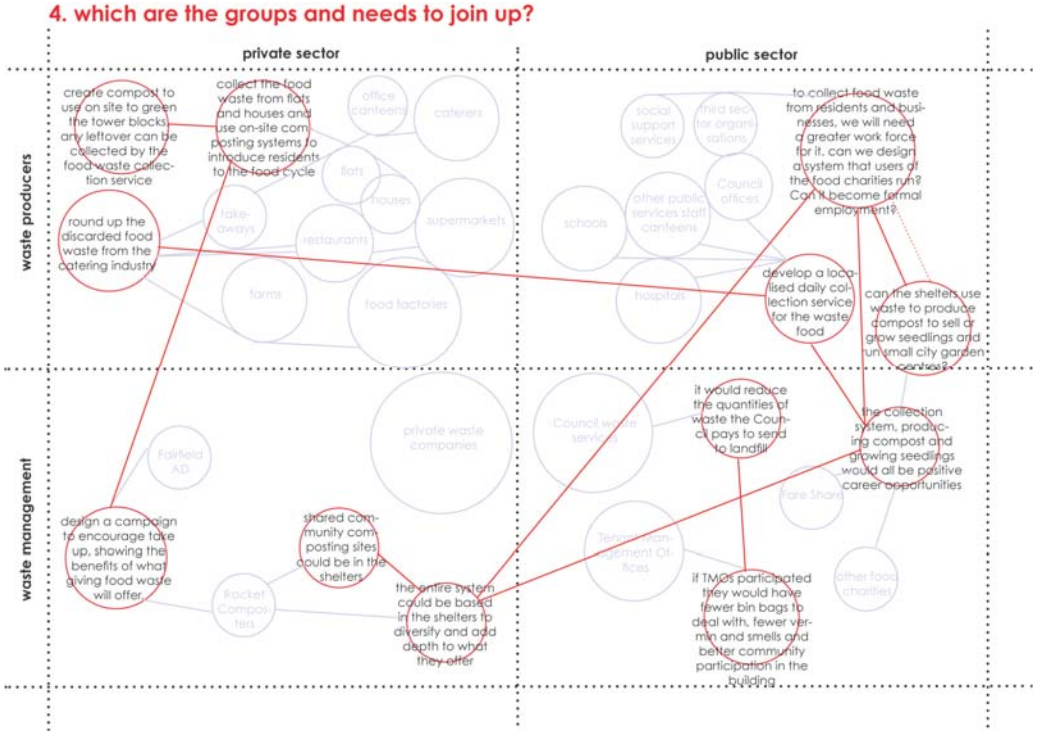




3. which are the areas for design to tap?



4. which are the groups and needs to join up?



Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Hidden Value of Allotment Gardens in The Urban Context and The Opportunities for Design Intervention

Richard A. Brault[1]

Abstract

This paper shares observations of the author's 10-year involvement in a community allotment garden and its role in 'helping individuals live better, reduce their ecological footprint and regenerate the social fabric'.[2]

Community gardens (also referred to as urban allotment gardens) are about inter-connection: they connect people to food, people to living systems, and they connect people to each other. They address many relevant issues of our time, yet they are misunderstood by most, and generally ignored by the design profession.

The author suggests that urban allotment gardens deserve to be recognized as a relevant topic for design research and development. A challenge is made to design schools and several strategies are proposed.

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1. Introduction

> *Jackie and Lorraine pose for the camera as they eat some soup. Today is our spring clean-up where members get together to work in the garden and prepare the soil for another growing season. The sun is shining, the weather has warmed and we are having a busy time. Three years ago, Jackie – homeless and in her early 20s, appeared at the garden like many others have. For several weeks, she slept on the ground at night and protected her 'adopted' plants by day, never saying a word to anyone. She was not a member but she was welcomed just the same. Nobody knew Jackie's story although it was clear that she was dealing with some difficult issues. And Lorraine, a founding member of the garden always made sure she was ok. Today Jackie is a regular member, who talks, asks questions, participates in the clean up and tends to her allotment. She has a home nearby and an email address to remain informed about garden events. We still don't know her story but we know that the garden has and continues to be an important part of her life. (Brault 2008)*

Designers appreciate working on interesting projects and I have had the good fortune of working on several during my career. One project in particular, although it has not generated a single dollar in income for my office has nevertheless provided worthwhile dividends year after year. It's a tiny community garden next to our studio in downtown Toronto where approximately 30-40 people from the neighbourhood grow food or flowers and maintain a small green space for the community.

For 10 years, I observed countless episodes like Jackie's story described above. I also had the opportunity to reflect upon what this garden represents, the lessons it teaches not only about gardening, but also about community, connection, sustainability, and ultimately about design.

If one was to describe the general characteristics of this garden in the manner one would describe a 'product' or 'building' the list could look like this:

- Operates on solar energy
- Made of natural and bio-degradable materials
- Requires little or no maintenance
- Becomes more beautiful with time
- Is impervious to all weather and seasonal conditions
- Is accessible 24 hours a day
- Costs little or nothing to use
- Fits in a small space

The list would continue with:

- Builds community in a neighbourhood
- Inspires strangers to randomly meet each other and spend time talking face to face in a relaxed and convivial manner
- Creates dignified connection between people from extreme socio-economic realities (i.e. a homeless person and a successful business person)
- Allows apartment dwellers without private land to grow their own food
- Raises awareness of living systems, organic agriculture, biodiversity, rain-water harvesting, composting
- Develops horticultural skills and knowledge
- Promotes healthy physical activity

It would conclude with:

- Creates oxygen and aborbs CO_2
- Produces food for people
- Provides food and habitat for insects, butterflies, birds and small animals
- Brings enjoyment, tranquil relaxation and beauty
- Motivates people to freely give their time and expertise

This is an impressive list of features. In fact, it would be challenging to find other man-made products that could make such claims. Yet these are actual outcomes of the Alex Wilson Community Garden and other similar 'products' called *urban allotment gardens*.

Urban allotment gardens exist in the heart of many large cities, often occupying vacant or abandoned lots and built from salvaged materials and rescued plants. They are cared for by city dwellers who live in high-density areas who don't' own land but who have a connection to gardening either through personal history, cultural background and/or economic necessity.

Onlookers and neighbouring residents sometimes complain of their messy appearance. Policy makers and planners in both developed and developing countries have at times described them as 'undesirable' and even '*anti-modern*', and they are often destroyed to allow room for new buildings or other forms of urban progress (Irvine et al. 1999, 35)

Yet it is clear that urban allotment gardens address many relevant social and ecological issues of our day. They are filled with hidden value. They connect people to food, ecology and living systems; they connect people to each other. They assist those with low incomes. They create a context where beauty or conviviality can happen at random. They link micro to macro, local to global. They bring joy, provide healing and offer quiet contemplation in the heart of a busy city. They do it all quietly, gracefully and inexpensively without much involvement from the design profession.

Urban allotment gardens fall between the cracks of landscape architecture, architecture and industrial design. They seem all but ignored by the design profession. They are invisible, buried in the shadows of our man-made technologically driven, fashion-conscious world, where thin plasma TVs and Louis Vuitton handbags seem sexier and more modern than a patch of land with food plants in a noisy city.

2. The Alex Wilson Community Garden – a brief history

The Alex Wilson Community Garden was created in memory of Alex Wilson, a Toronto author, landscape designer and activist. Wilson organized a community garden on a vacant lot next to his house in downtown Toronto where friends and neighbours gathered to grow vegetables, fruits and native plants. Shortly after his death in 1993, the landowner decided to sell the property. Wilson's friends attempted to buy the land to create a permanent garden in his memory but the land was instead sold to a developer and the garden was destroyed to make room for new construction.

Wilson's friends decided to search for another nearby site where a community garden could be built. At the time, my partner and I were looking to create a community garden on a tiny parcel of land (10 x 30 m) next to our studio located just a few streets from the original garden site.

Through fortunate circumstances, we were introduced to each other in April 1996 and met shortly thereafter to share intentions and ideas. Having already lost their original garden to development, Wilson's friends were hesitant to create a new one on land that could eventually become a construction site. They were looking for a permanent site. After reviewing several options we decided that the best solution was to donate our land to the City of Toronto with a conservation easement registered on title. The land would become a public space, protected from future development; the easement ensured it would remain a community garden in perpetuity.

There was enough creative talent within the committee to design the garden (Wilson's friends included an architect, a landscape designer, a horticulturist, a professor, a writer, a filmmaker several artists and neighbours; my partner and I were industrial designers). But instead it was decided that Wilson's legacy would be best served by holding a professional design competition and for the next months, the committee's energy turned toward the organization and logistics of the competition. Guidelines were prepared, announcements were distributed, a competition document was published and a site visit was organized.

Over 140 teams registered and when the deadline day arrived, 67 entries were submitted. Each entry consisted of a scale model with a 300 word written description. Submissions came from architects, landscape designers and artists, the majority from the greater Toronto area. Each model represented a design proposal for the tiny site and each was required to fit inside a larger context model that included the adjacent buildings. Participants were told that the winning entry would be constructed on the site so in order to win, their design had to satisfy the competition criteria within our specified budget.

In February 1997, a professional jury reviewed the entries with technical input from city staff and social agencies. Five finalists were selected and interviewed and ultimately one entry was chosen as the winning design.

The Design Exchange, Toronto's design museum offered to host a major exhibition the competition entries. A brilliant exhibit was created with a miniscule budget using corrugated cardboard podiums positioned against a hand-painted mural of the winning site plan. During its four-month showing, the exhibition attracted several thousand visitors. Toronto's mayor viewed the exhibit and commented that every single proposal deserved to be constructed.

The winning team consisted of two landscape architects and one architect. In addition to their prize, they were given a budget to prepare final working drawings. In June 1997 the committee organized a 'ground breaking' celebration and soon afterwards, the small parking lot was demolished to allow for the garden. A local company was hired to build the garden and many volunteers helped.

The design of the garden tells the story of our relationship with the southern Ontario landscape, from the shores of lake Ontario with its sand dunes and native grasses to the northern woodlands with white pine, shrubs and pink granite. A meandering boardwalk travels the length of the garden connecting Richmond to Queen Street creating a much-used route for many pedestrians who stop to enjoy a moment of tranquility in a busy city.

At the centre of the garden occupying most of the site are 40 small food-growing allotments rented each year by people in the neighbourhood. Rainwater is collected in large tanks, there are bicycle posts, tool sheds, compost bins and a central circle for gatherings. Walls from adjacent building provide massive vertical surfaces for vines on both east and west sides.

From the designer's perspective, a garden must be approached differently than a building. Whereas a building looks best when it is new (and often empty), gardens become more beautiful with time. In the first year, the trees, shrubs and plants are small and scattered but as the garden becomes established, the emptiness fills in with lush foliage as the trees and shrubs mature. It is constantly evolving. The end of construction is simply the beginning of a process that will ultimately lead to an intended aesthetic, years away. The designer's responsibility is to provide a framework where this process can happen gracefully over time.

The official opening took place on June 21, 1998, and the neighbourhood greeted the Alex Wilson Community Garden with expected enthusiasm. They welcomed this tiny green oasis on a busy artery where evening rush hour commuters raced home from their downtown towers to suburban homes, unaware that people actually lived here among these low-rise converted factories and parking lots. This was home to a rich mix of people from all socio-economic and cultural realities.

People rented the allotments and planted a variety of food crops or flowers. Members included professionals of all stripes, single mothers, homeless, couples, artists, and people recovering from mental health or substance abuse. They all rubbed elbows and got to know each other. One member commented that they lived in the area for 20 years and until they joined the garden, didn't know anyone in the neighbourhood – typical of our urban existence where we can't stop to chat because we are always rushing to get somewhere.

A retired university professor walked through the garden for eight years and one day started chatting with a member tending to her plants. He decided to rent an allotment. A widow moved into a nearby condo and was delighted to join the garden and keep her hands in the soil. A group of immigrant women came to grow herbs and learn English. Directly west of the garden is a non-profit social housing complex with 46 units where residents deal with a variety of difficult challenges. Many of them participate in the garden. For some, it is their first garden experience.

Mike, a 50 year-old homeless man arrived everyday at the garden pushing an old bicycle loaded with his possessions from under the expressway bridge where he camped each night. He helped during construction and for 5 years, he watched over the garden, watered the trees and shrubs, swept the boardwalk, built birdhouses from scrap lumber. He rescued abandoned plants from the neighbourhood and transplanted them in the garden. During the winter he would chip the ice from inside the frozen water tanks and place the large blocks at the base of the trees creating a spectacular landscape of crystal. He made sure his homemade birdfeeder was kept full until spring. Mike accepted odd jobs to earn some cash but never did he ask anything from anyone. A local merchant gave him a part time job and whenever he felt he had too much cash in his pocket, he'd knock at our studio door and ask if we'd keep it for him. We became his bank. Everyone knew Mike. He was the garden angel. Then one year, he didn't come back. We found out that he was working for a landscape company and after many years in the cold, was able to rent an apartment across town.

Each garden season begins with a clean up day in April when warmer temperatures arrive. Returning members meet new ones and they prepare the soil, prune the shrubs and lay fresh straw in the pathways. Everyone brings a vegetable for a large pot of soup that is cooked on-site and enjoyed after the work is done. Throughout the season, people tend to their allotment. Sometimes, they meet other members or chat with visitors on the boardwalk. Life in the garden is informal and convivial. In October members come together for the fall clean-up day and once again a big pot of soup is prepared and enjoyed. The winter months are quiet with daily visits from birds and squirrels tha stock up seeds and berries.

As the Alex Wilson Community Garden enters its 10th year, it is remarkable the extent to which the small site is respected. The fact that it is not gated, not lit at night, accessible 24 hours a day, surrounded by graffiti-filled alleys, nightclubs and considerable overnight activity, one would expect it to be an easy target for vandalism or undesirable activities.

There have been problems but these have been relatively infrequent and reasonably minor. When they arise, the gardeners restore the damage quickly. There's always some trash, bottles or cans to pick up. One particular morning after an oppressively hot summer night I found 30 used crack needles under the pine trees, left there by neighbourhood drug addicts. On another occasion, a double mattress was removed from the same spot.

Surprisingly there has been no graffiti considering the alley directly behind the garden is one of Toronto's most active paint zones. The infrequent 'tag' appears every now and then but it gets removed (recently by a graffiti artist who considers the garden to be a sacred space), or covered by a birdhouse that Mike built. The food-growing allotments are rarely affected but come harvest time, certain crops inevitably attract local poachers (four-legged and two legged ones).

Occasionally a homeless person finds a quiet spot under the shrubs to spend the night in relative safety. Drunks have passed out on the boardwalk in broad daylight. There have been numerous discussions about gating and locking the garden at night but some feel that more would be lost than gained. A community garden is as much about 'community' as it is about 'gardening'.

In 2003, the garden became entangled in a landmark battle with a developer who purchased the property on the south side of the street and wanted to build a 45m condo, twice the allowable height. The additional height of the building would block the midday sun and push the garden into a full shade condition for most of the year.

The members opposed the project and organized themselves to defend the garden's right to sunlight. The developer's application was rejected by the City of Toronto but they appealed the decision at the Ontario Municipal Board (OMB), a provincial body with a history of overturning planning decisions made by municipal councils in favour of development. At the OMB hearing the lawyers representing the developer and their 'expert witnesses' argued that the shadow impact on the garden from their 45 m building would be insignificant. The gardeners argued that the impacts were not only significant, but they also threatened the garden's very existence.

The developer's architects presented an 80-page document with computer generated shadow diagrams to support their argument. But upon careful scrutiny, it became evident that the document omitted the shadow diagrams where the impact on the

garden was most severe. The only option for the members was to prepare an equally competent shadow study that showed the true impacts. The process consumed weeks of preparation.

In their final decision, the OMB rejected the project application and ruled in favour of the garden's right to sunlight. The developers had to redesign and eventually build the condo to comply with the site's height limits. Today the sun continues to shine in the garden.

3. The Hidden Value of Urban Allotment Gardens

It's difficult to estimate the number of urban allotment gardens scattered across cities around the world. They are everywhere. Toronto has upwards of 70 gardens (Irvine et al. 1999, 34). Boston has close to 200 (Boston Natural Areas Network). They exist on vacant land, between buildings, or on rooftops in cities in all continents (Deelstra 1987).

There are networks and associations that connect, educate and advocate on behalf of allotment gardens at all levels. The Toronto Community Garden Network (www.tggn.ca) is a volunteer organization that promotes community gardening in Toronto, assists with implementation, organizes workshops, and publishes a monthly e newsletter. Other cites have similar organizations. The *American Community Garden Association* (www.communitygarden.org) and the *National Society of Allotment and Leisure Gardeners* (www.nsalg.org.uk) in the United Kingdom provide support at the national level. The *Office International du Coin de Terre et des Jardins Familiaux* (www.jardins-familiaux.org) represents 15 national federations across Europe with more than 3,000,000 gardeners.

Urban allotment gardens address similar issues today as when they first appeared in the early 19th century Europe at the dawn of industrialization: they provide a small piece of agricultural land to city dwellers as a means to grow their own food (Irvine et a. 1999, 36). At a fundamental level, they contribute to a family's survival during times of economic hardship. In Matalahib barrio in Quezon City within metropolitan Manila, a remarkable allotment garden was created on 1.5 hectares between two squatter communities in 1980. It was initiated by 2 police officers that felt the garden would reduce violence, bring the communities together and help feed families. With technical assistance from a local NGO and university, and volunteer help from off-duty police officers, people were able to grow nutritious crops that met 80 per cent of the needs of 400 families. The Matalahib garden was unfortunately destroyed within 2 years to allow for development (Wade, 1987).

Regardless of culture, economic stature or climate, gardens seem to share a common set of outcomes. In his book *Get A Life* (1995) Dr. Wayne Roberts provides an eloquent summary of the hidden values they offer, many of them validated in the Alex Wilson example. He writes:

> A small patch of land given over to community gardens packs more uses into a compact space than a Swiss Army knife. At one and the same time they:
>
> – Allow people who own no land to produce fresh food… at virtually no cost;
> – Provide healthy outdoor exercise, relaxation and even therapy;
> – Offer recreation the whole family can take part in;
> – Extend the constituency for city parks to 'passive' users often excluded from parks built around 'organized recreation' for [athletes];
> – Act as a neighbourhood crime watch, Jane Jacobs' "eyes on the street," over many hours of the day and evening;
> – Beautify derelict land on a pilot project basis, without the deeds required for permanent structure;
> – Add biomass that converts excess carbon dioxide into oxygen;
> – Create space for a "new commons," public space for hanging out that was lost when streets were taken over by cars;
> – Provide a natural fire barrier between buildings;
> – Add to green space that can absorb rainfall and divert it from sewers;
> – Provide common ground for community development in low-income areas such as Walnut Terrace, North Carolina, where, supporters say, "the community garden is a deterrent to destructive or apathetic behavior because its very existence is an expression of people's togetherness, productivity, hope, responsibility and caring for the whole environment, from flowers to neighbors and families;"
> – Provide fertile ground for transplanting immigrant food traditions
> – Provide a job-training center for at-risk youth, as pioneered in Boston
> – Creates spinoff jobs in commercial greenhouses and allied fields, as in San Francisco, where the homeless get top dollar for 26 varieties of salad greens sold to leading restaurants, because, as urban critic Terry Fowler describes one such project in the Bronx [New York City],"in the course of organizing themselves to grow food, the people also organized a project to generate their own power;"
> – Offer a site for innovative partnerships with governments and charitable foundations, which can match grants to community "sweat equity;"

- Work out the bugs in sustainable agriculture, including organic growing and, in dry climates, low-water xeriscaping;
- Encourage advances in intensive agriculture, since, in contrast to corporate farming, space is at more of a premium than time;
- Lower garbage disposal costs by providing nearby outlets for composting kitchen waste, the “twin sister” of community gardening;
- Reduce the costly highway infrastructure for food transportation, and encourage “urban villages” where key services are within walking distance;
- Teach respect for nature, farming, natural cycles and future orientation, as in Boston’s inner city where Dr. Arturo Cervantes, supported by Schweitzer Urban Fellows, finds the most important work he can do from his clinic is to teach children how to garden because it teaches them to gauge future results from actions taken today; that is, you plant now, you reap in six months (Roberts 1995, 95).

Roberts argues that community gardens are an elegant form of economic and social judo “ that turns the weight of a problem to advantage by flipping it into a solution” (Roberts 1995, 96). Allotment gardens not only optimize limited resources, they also leverage them. Every dollar invested seems to create several dollars in value, whether from volunteer efforts or “sweat equity” as Roberts describes, to material and plant donations, to crime reduction, increased health, to the teaching and sharing of knowledge.

The benefits extend beyond the food-growing needs of the urban poor. People living in big cities, regardless of their economic position, and particularly those living in crowded residential towers suffer from a general disconnection to the natural world and living systems. In ethnographic research conducted by environmental scientist Christopher Ferguson, city dwellers were asked what was missing to make their life more sustainable. One respondent who had moved from farm to city explained:

> When you live in the city it is easy to become disconnected with the natural world. The more you become disconnected the more you take advantage and abuse the things that supposedly make life easier- using the car all the time- buying food from all over the world- buying meat in Styrofoam containers- rather then understanding and connecting with what is around you (Ferguson 2008).

Ferguson found that people wanted ways to be live more sustainably and the opportunity to participate in activities like community gardens helped begin a process of connection that opened new perspectives and possibilities for all parts of their lives. Little by little people become aware of their consumption patterns, about the food they eat, the cars they drive, the products they buy (Ferguson 2008). Awareness is the first step toward meaningful change. If such opportunities are not readily available, or not within a 3-minute walk from home (Alexander et al. 1977,305), the connections are difficult to establish.

Design Opportunities

Urban allotment gardens must be recognized as a relevant topic for design research and development. At the very least, design intervention could improve their image from being perceived as ‘anti-modern’ to one where they are considered *visionary* in how they address a myriad of issues with elegance, economy and beauty. The Alex Wilson example demonstrates this clearly. With intelligent design intervention they can become an integral component of a healthy urban environment, and an important element to the built-form requirements of any city.

Presently urban allotment gardens get little attention from the design profession. Whether they seem unsavoury as a topic or are simply invisible because they fall between the cracks of our major disciplines, they deserve some serious consideration. They offer a rich opportunity for inter-disciplinary design collaboration between landscape, industrial, architectural, and graphic design. They invite input from the environmental sciences, horticulture, agriculture, ecology, horticultural therapy, and occupational therapy.

I challenge design schools to begin this process.

Many students would welcome the opportunity to ‘cut their teeth’ on projects like urban allotment gardens that help communities live better while reducing their ecological footprint. Within the core curriculum of an undergraduate program, students could gain considerable knowledge, technical skills and ‘hands-on’ experience in all aspects of urban allotment gardens. They would welcome the collaboration with other disciplines. Experimental gardens could be created in abandoned corners of campus property and also on building rooftops that are structurally adequate. The students would provide the design, construction and maintenance. Crops could be given to local shelters.

There could be exchanges between design schools from different cultures and climates where students gain an appreciation and respect for local traditions, crops and conditions while working side by side with local people. Such exchanges would create an equitable transfer of skills and knowledge where each culture learns from the other. Schools could form an international alliance or network to share information (e.g. Toronto – Milano - Sao Paolo - Nairobi – Bejing - Bangalore).

At the local context, the school or university could initiate collaborations with local clients or sponsors such as municipal governments, public housing authorities, hospitals, senior residences, elementary schools and private corporations whereby the students provide technical assistance and participate in the construction. Such outreach projects would bring the gardens into the community, similar to the way architect Samuel Mockbee and his students at Rural Studio delivered an ‘architecture of decency’ to clients in Hale County Alabama.

Design competitions present another viable strategy. The Alex Wilson competition attracted 67 submissions from teams of architects, landscape designers and artists in Toronto. The topic clearly mattered to the design community, given the creativity and

effort that went into the entries. In a recent article of Metropolis Magazine, Susan Szenasy explains, “[w]hen design competitions *reach for relevance* (author’s italics), they can lead to discussions that move our thinking forward” (Szenasy 2008). They contribute to an ongoing dialogue and body of knowledge.

Competitions also offer the opportunity to explore specific themes or technical challenges, for example extending the growing season in cold climates or water harvesting in dry climates. They could be organized locally or internationally. Competitions raise awareness through media and exhibitions and provide a vehicle to showcase the creative talents of a profession that is in tune with the times.

In his book *The Culture of Nature: North American landscape from Disney to the Exxon Valdez* (1991), Alex Wilson wrote:

> We must build landscapes that heal and empower, that make intelligible our relations with each other and the natural world: places that welcome and enclose, whose breaks and edges are never without meaning. Nature parks cannot do this work. We need urgently need people living on the land, caring for it, working out an idea of nature that includes culture and human livelihood. All of this calls for a new culture of nature, and it cannot come soon enough (Wilson 17).

Community gardens contain countless opportunities and rewards for forward thinking designers and educators seeking to bring their creative energies and talent to an area that demonstrates great relevance yet remains largely untouched. These gardens will never go away. They are like the little weeds that appear in the crack of a concrete sidewalk: they grow against all odds, reach for the sun, produce a flower, attract pollination and spread seeds. These seeds are falling on the doorstep of our profession. If we plant them, they will blossom.

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Fig. 1: The Alex Wilson Community Garden in downtownToronto (shown at the completion of construction, 1997). The site measures 10 x 30 m, has 40 small food-growing allotments and three naturalized areas with plantings of native species. The land is protected to remain a community garden in perpetuity.

Fig. 2: Visitors view the exhibition of the 67 competition entries. Each entry consisted of a scale model and a 300-word description. The podiums were fabricated in corrugated paper and recycled after the 4-month exhibit. (Design Exchange, Toronto. June 1997)

Fig. 3: A successful harvest of herbs and leafy vegetables. This group of ladies came to garden and practice their english.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

New configurations for networks

The case of the Virtual Institutes

Ivan BURSZTYN[1], Luiza Farnese de Paula LANA[2]

Abstract

It is permanently stressed that information technologies are a powerful tool to change our lives. The countless possibilities of use of the worldwide web can contribute to the formulation of new behavior paradigms in modern global society. This article aims at analyzing the idea of Virtual Institutes as a tool for exchanging experience and for establishing dialogic relationships among people interested in a given field of study. It examines the implementation of the Virtual Institute of Tourism. Its main theoretical references are Ivan Illich´s "tools for conviviality" (1975), Ezio Manzini´s "enabling systems" (2007) and Manuel Castells´s "network systems" (1999). After presenting the experience of the Virtual Institute of Tourism, the paper will discuss the creation of the Virtual Institute of Social Innovation.

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1. Introduction

It is permanently stressed that information technologies are a powerful tool to change our lives. The designer, as a “bridge builder” between technology and society (Flusser 2007), has a new field to work on: translating, adapting and designing instruments that may realize the full potential of change of these new technologies. One of the contemporary challenges concerns the use of internet as a basis for new types of social relations. The countless possibilities of use of the worldwide web can contribute to the formulation of new behavior paradigms in modern global society.

This article aims at analyzing the idea of Virtual Institutes as a tool for exchanging experience and for establishing dialogic relationships among people interested in a given field of study. It examines the implementation of the Virtual Institute of Tourism. Its main theoretical references are Ivan Illich´s “tools for conviviality” (1975), Ezio Manzini´s “enabling systems” (2007) and Manuel Castells´s “network systems” (1999). After presenting the experience of the Virtual Institute of Tourism, the paper will discuss the creation of the Virtual Institute of Social Innovation.

The objective of the Virtual Institute of Tourism is to “*support the creation of research networks on relevant themes for society*”[3]. It was established in 1999 by the Laboratory of Technology and Social Development of the Production Engineering Graduate Program of the Federal University of Rio de Janeiro (LTDS). The Virtual Institute aims at facilitating the exchange of information, knowledge and services through a network involving researchers, experts, professors, students and institutions whose work deals on tourism. The Internet is its most important mean of diffusion, and the site which houses the Institute is found at <www.ivt-rj.net>.

Nine years after its foundation, the Virtual Institute of Tourism is a central locus for interaction and collaboration for its more than 2,000 participants, that include brazilians and foreigners. However, keeping this network active and productive is a continuous challenge. It has demanded several strategies of mobilization its participants. It has been necessary to overcome obstacles as physical distance and the daily duties of the participants, not to mention the common reluctance to make use of collaborative communication tools. Throughout the years the coordination team has noticed that the network participants are more apt to make contributions when demanded to perform specific activities. Therefore, the Institute restructured its activities so as to stimulate the participation of its members. As a result, we can mention the publication of the book “Turismo e Sustentabilidade no Estado do Rio de Janeiro”, the organization of the “Virtual Workshop: Tourism and Social Development” and the creation of the peer review board for the journal “Caderno Virtual de Turismo” (ISSN: 1676-6976).

As a consequence of the recent strengthening of the relations between the LTDS and the Politecnico di Milano, through professor Manzini, new possibilities of collaboration have emerged. One of them is the creation of a virtual institute dedicated to the subject of social innovation and design in Brazil. The interest on social innovation in the Brazilian context has arisen from the participation of the LTDS in the project Creative Communities for Sustainable Lifestyle (CCSL), coordinated by Prof. Manzini. There are already academics from 17 universities affiliated with VISI. Another theme of interest is the role of design in the formulation of strategies for mobilizing and enlivening networks.

The Virtual Institute of Social Innovation is still at an early stage, but the idea is to build on the experience of implementing Virtual Institute of Tourism. Besides supporting the academic debate about social innovation, it aims at stimulating the exchange of experience and information among socially innovative initiatives, including the stakeholders directly responsible for those activities.

[3] http://www.faperj.br

2. The Information Society and Network Relationships

Great part of the transformations that the world faces today is a consequence of the great changes that occurred, mainly in the last few decades, consequences of the development of new technologies in information and communication. These advances have implemented a new relation in space-time, shortening the geographic distances and allowing that information to circulate around the globe in current time. Beyond these, many other transformations are consequences of the development of the new technologies of communication, which demand a deep reflection of how the society comes to act and react to the great changes.

Manuel Castells analyzes these changes in society having as reference the diffusion of the use of the new communication technologies. In his book, *The rise of the network society*, the author makes an analysis of the transformations in the way of producing and the relations between the people, companies and institutions from the mid 80's by what it calls "*the informational way of development*". This , in turn, is "*the action of knowledge on the proper knowledge as main source of productivity*" (Castells 1999, 35), what, according to the author, leads to a new technological paradigm, based on information technology .

When explaining what is understood of the *network society*, Castells indicates initially that the networks are "*structures capable to expand in limitless form, integrating a new us since we can obtain communication inside the network, that is, if we share the same codes of communication (for example, values or objectives of development)*" (Castells 1999, 499). The society in the network, in turn, is the society in the mid of these structures and in a certain form of way, it is guided by it.

It fits to distinguish that Castells when glimpsing this new middle scene for the networks - laces of flows of capitals and information - currently indicates that, "*the new economy is organized around global networks of capital, management and information*" (Castells 1999, 499) and that "*the synthesized processes of social transformation in the ideal type of society in the network exceed the sphere of social relations and techniques of production: they affect the culture and the power profoundly*" (Castells 1999, 504).

From the new existing communicational structure it is possible, and necessary, that we have to think beyond the circulation of capital, management and information dominated by a specific source. The space to fill the potentialities of the existing instruments is the one that provokes deeper changes, allowing the contribution of individuals and institutions of local scope in the construction and reflection of global transformations.

In this prism Virtual Institutes have been thought of as the primary tool. Taking into account the existence of an informal network already, however dispersed and with tenuous relations still marked by the distance geographic locations in Brazil, a virtual platform of contribution was created that served as one privileged locus of contribution between the diverse interested segments in theme of reference of these Institutes. Using the potential of the new information technologies, the virtual institutes represent the effort to congregate in one same space people and institutions that argue and consider action of global transformation and repercussion, from local experiences.

These networks of virtual contribution bring a new form of dialogue, exchange and collective construction that demand a bigger knowledge and reflection on its vulnerabilities and potentialities. It is in this direction that this article works, learning trough trial and error the experience of implementation of the Virtual Institute of Tourism and reflecting on the possible contributions of this network of virtual contribution in the development of a network about the theme of Social Innovation.

3. Conviviality and Enabling Solutions

As we saw, the global contemporary society lives in a moment of great possibilities for the cooperative and collaborative work. It was never so viable technically to surpass the geographic barriers and to shorten the distances that separate the people of the world. However, this favorable scene is contradictory to our more individualistic positions in our lives. The hegemonic way of relations in the capitalist society where we live has as one of its pillars maintenance and amplifying individualism. As Bauman (2001) told us modernity is the age where social life starts to have as center the idea of the existence of the individual and individualism, demarcated by an increasing autonomy in relation to communitarian and social life. In the words of the author, "*the presentation of the members as individuals is the registered mark of the modern society*" (Bauman 2001, 39).

In this context, an excellent question that deserve attention presents itself, the potential use of the new information technologies in favor of the new relational standards of this generation and its diffusion. Illich (1973) shows us that the *"produced tools"* in the industrial age has lead our society to adapt some aspects of our lives like models of production in production series. However, as the author points out, the hour has arrived to retake the reins of our lives, placing the "*tools*" created by the men in benefit of the creativity and freedom of action.

> *"I will suggest how this present trend can be reversed and how modern science and technology can be used to endow human activity with unprecedented effectiveness. This reversal would permit the evolution of a life style and of a political system which give priority to the protection, the maximum use, and the enjoyment of the one resource that is almost equally distributed among all people: personal energy under personal control. I will argue that we can no longer live and work effectively without public controls over tools and institutions that curtail or negate any person's right to the creative use of his or her energy. For this purpose we need procedures to ensure that controls over the tools of society are established and governed by political process rather than by decisions by experts"* (Illich 1973).

For Illich, the possible solution for a transition of the current society to "*a more convivial*" society is in the redefinition of available "*tools*" today or the creation of "*tools*", in order that they become "*tools for coviviality*". "*Tools*" that are in the service of creativity of humans and not defining them.

The search for the paradigm of "*conviviality*" implies a significant change of today's effective ethical and technical values. Of the ethical point of view, our society needs to rethink the limits of its action in order not to compromise its proper existence, retaking the essence of the relations between humans and the way they live. Of the technical point of view, to project tools that propitiate the establishment of these new social relations. And, as such, does not exist ready prescriptions, but the necessity to reaffirm the commitment every day (Illich 1973).

Convergent with the proposal of Illich, Manzini (2007, 2005) presents the concept of enabling systems, capable to support and to favor the sprouting of the new relational standards considered by Illich. The convergence pointed here does not imply to ignore diverse horizons of technical facts of the formularizations in question. The proposal of Illich remains in a previous horizon to the existence of the Internet. Its level is much less effective operational than that of Manzini, for who the enabling systems are organizations capable to transform the resources of its users into individual and social values, making of its participant part of the solutions.

However, Manzini alerts for the risks of trying to project all the elements of these solutions. When dealing with the relations between the people, it is not possible to predefine all the interaction forms, under the risk to destroy them. It is necessary to create favorable contexts so that such solutions develop in a bottom-up movement. Thus, the author detaches as possible enabling foundations instruments of government, infrastructures and public spaces of meeting conceived to facilitate and to consolidate base innovations (Manzini 2007).

Manzini points with respect to two possible types of planned interventions: the enabling platforms and solutions. Enabling platforms are combinations of products, services, knowledge and procedures that, in data context, qualify the people to have access to a set (different, but with

common characteristics) of results. Already the enabling solutions would be the combinations of products, services, knowledge and procedures that, in data context, qualify the people to reach a result.

In both the cases, the active role played by the participants gains prominence. According to the author:

> *"We must place new idea of service alongside the currently dominant one of services disabling systems. Idea If today the most widely held is one in which the service itself is designed considering users only an expression of problems (problems you solves requiring minimum of participation on to their part), the new idea of service must instead start with what to user knows how you, can, and wants you of. In to other words, the service must be conceived an enabling system, one that matches user's desired result, with an to offer of the means by which you achieve it using his own capabilities you the best advantage and, if appropriate, stimulating his desire you of and delight in taking part in the game"* (Manzini 2005, 4).

Certainly, participation is one of the great challenges of this process. The capacity to mobilize users and to promote its auto-organization demands of the designers creativity and sensitivity to develop "*tools for conviviality*" that is potential to the individual efforts.

As we will see, we believe that the Virtual Institutes can present a fertile way as qualifying solutions directed toward the academic research in specific thematic areas. Based in the establishment of collaborative and cooperative relations between researchers, the Virtual Institutes place the new information technologies to service of the public interest and the exchange to knowledge, in a peer-to-peer relation.

4. The Virtual Institutes

The Virtual Institutes program was launched in 1999 for the Research Foundation of the State of Rio de Janeiro (FAPERJ), with the intention to support the formation of networks of research on subjects for the society and the economy of the state of Rio de Janeiro. The program had as objective to identify and to register the academic-scientific, scientific-enterprise abilities, in a way to promote actions integrated in its respective areas of performance. Another goal of this program was to promote and to spread the available knowledge of the community in the state about each one of the areas by means of integrated actions, such as events, seminaries and courses. The program longs to attract complementary, national or foreign abilities, with the purpose of promoting strategically, definite actions as essential for the development of the areas of performance of Virtual Institutes.

The Virtual Institutes are part of the Program of Advanced Studies of the FAPERJ, whose objective is to support and to induce a already existing form of scientific cooperation from nuclei of excellence. The base of the program is the notable demography and installed capacity of the scientific community of the state, characterized for high qualification, creativity, variety to discipline institutional and international insertion and ability to generate results with strong public and social impact.

Initially six thematic fields for the performance of the Virtual Institutes had been chosen: The International of Global Changes; Logistics and Economy; Social state of the Nation; Tourism; Bio-information; and finally the ability of Democracy and Separation of the Three powers in Brazil. However, the lack of clarity in the definition of the concrete actions that would have to be played by each Institute after they were made, the coordination of the program extinguished five of the six after 2 years of performance. In this occasion, the only Virtual Institute that showed concrete results of operation was the Virtual Institute of Tourism.

In 2003, a new election was made so that the headquartered institutions of research in Rio de Janeiro received the proposal of six new Virtual Institutes in the following thematic areas:

Sport, Neurodegenerative Illnesses, Dengue, Nano-science and Nanotechnology, Pharmaceutics and Paleontology. The new Institutes have joined the Virtual Institute of Tourism in the effort to define more clearly its line of performance. Some have seized to exist, however, we can detach the performance of the Virtual Institute of Tourism as emblematic by the point of view that it joins the researchers of the area and it tied academic production.

The state of Rio de Janeiro is the state that receives the most tourists in Brazil. Its natural beauties and the affection of the Carioca people (people who born in the city of Rio de Janeiro) are known allover the world. However, up to 1999, there practically did not exist scientific research of quality in the academic environment on the subject and the ones that existed were dispersed. The courses of graduation in tourism installed in the state were all tied to particular institutions of education with its focus in the formation of human resources for the work market. As we will see ahead, the scene changed in last the nine years and the Virtual Institute of Tourism contributed at this change.

5. The Virtual Institute of Tourism

The tourist sector is pointed out by the World Organization of Tourism (OMT 2001) as the second biggest economic activity of the world in income generation and jobs, in 2006. It generated about 380 million work ranks. However, the economic potential of the tourist activity has not had only positive effect in the socio-cultural and environmental conditions of the societies and receiving communities.

With relation specifically to the Brazilian case, tourism activities in small communities supported by public politics had not brought the promise of potential benefits for the local populations. This verification implies the questioning of such practices and public politics that supports them (Bartholo et al 2008). Some successful experiences of communitarian tourism (Bursztyn 2005; CNPQ 2003; Oliveira 2004; Sansolo 2006; Saviolo 2003) bring important subsidies to this debate, pointing ways that can be fruitful for the promotion of taking tourist root activities in a local model of development, with more social justice and environmentally responsible (Zaoual, 2006).

According to the NGO WWF-International (2001), the communitarian tourism is defined as a eco-tourism modality where the local community has substantial control and involvement in its development and management and most of the benefits proceeding from the activity, remain in the community. In this perspective, it is imperative that tourist activity is, in its bigger part, developed and operated for the local population, guaranteeing the economic support and making the resources proceeding from the tourism revert in direct benefits for the community (Bursztyn 2005).

These reflections on tourism and social inclusion are the questions that have motivated the birth of the existence of the Virtual Institute of Tourism (VIT), entailed project to the Laboratory of Technology and Social Development of the Federal University of Rio de Janeiro, that congregates, in its virtual headquarters (www.ivt-rj.net) diverse information on tourism, such as: notices, courses, events, essays, interviews and news articles, in the social developmental perspective. Moreover, the VIT edits periodically the scientific electronic journal Caderno Virtual de Turismo, with the same focus. The information contained in the platform are published and are accessible by any person and can be nourished by the net of users registered in the cadastre of the VIT: researchers, professors, students, collaborators, institutions with performance in tourism, constituting a quantity and quality of information on the subject.

Since August 1999, the VIT takes care of to the lines of direction of the FAPERJ institution, financing its activities, support the formation of nets of researchers to deal with excellent subjects for the society and the economy of the state of Rio de Janeiro. Throughout this period, the VIT explicitated its institutional mission and consolidated its structure, providing the accomplishment of the objectives defined in its original proposal.

Amongst the main ideas glimpsed for the Institute, we detach the constitution of a vast net of associate researchers who come growing throughout the time in function of the promoted activities.

The academic text of the VIT is well-known and enriches the debate on the theme of tourism, promoting its inclusion and rooting in the public institutions of superior education of the State of Rio de Janeiro, as a reference for the studies in the area of the tourism. The VIT is developed from a platform in the Internet, wich is the virtual headquarters of the Institute. Its main actions and proposals are concentrated on virtual search over all, to dynamize the exchange of information, knowledge and services by means of the constitution of a network.

The lines of action of the VIT have prioritized the boarding of knowledge, analysis and comparison of experiences developed for other institutions and groups, that can result in significant teachings for the formularization of strategical lines of direction for the politics of tourism and the deepening of the referring studies to the "tourism and social development" theme. Actions that have detached the work of the IVT for the stimulation to the proposal of the tourism as a possible potential element of beneficial effect of developmental politics, defending the planning and the incentive to more tourist activity.

The maintenance of the activities of the VIT is justified by the increased access of users, of academic means, interested in the material available in its electronic placing. In this universe, the prominence is the significant contingent of professors, researchers and pupils of the institutions of education in tourism.

However, the active participation of the members of the network, as pointed previously, is a daily challenge. Since the beginning of its activities, the VIT is dedicating to mobilize and to add new researchers in action. However, the lack of cooperative culture and domain of the computational tools moved away some researchers from the network that was forming. With passing of the years, the technologies of the information have been totally inserted in our lives, making possible a significant increase in the number of users of the VIT. The biggest domain of the technological tools also contributed to the formation of a cooperative culture, but it was necessary to develop some specific actions that will be described.

With the lack of systemized academic production in the field of tourism in the state of Rio de Janeiro, one of the first actions of the VIT was to launch in 2000 a scientific eletronic journal dedicated to the subject. The Caderno Virtual de Turismo, CVT (www.ivt-rj.net/caderno), was conceived with the objective to base the theme of tourism in academic means. In 2006, the CVT inserted in the world-wide net of periodic of open content that uses Open Journal System (OJS), developed by the Canadian project of public knowledge (PKP, http://pkp.sfu.ca). In 2007, a peer reviewer board was formed, with 85 researchers with doctorates level, to evaluete all submitted articles for publication. These actions had contributed decisively for a jump of quality in the available computational content. Today, the periodic accounts a quantity of 161 scientific articles, more than 300 authors, published in 26 numbers.

Another proposal of the VIT that fortified the academic basing of the tourism theme and the contribution between the researchers was the launching, in 2005, of a book on tourism and sustainability in the state of Rio de Janeiro. Until then there was no exclusive dedicated publication to the debate of tourism in the state. Since the beginning it was clear that it was not only about the chance to create an inexistent academic product, but mainly to establish a process of dialogue and reflection to materialize the idea of a collaborative work. The first meetings happened in January of 2002. The first guests suggested other names and the group of participants in debate about the book was extending. Nor all remained throughout the construction of the book, but the contribution of each one enriched the debate.

The proposal was not simply to congregate articles; there were many concerns about the coherence of the theoretical references. The process included a series of meetings carried throughout the years of 2002 and 2003. Each one of the concepts and subject-key was discussed in the group, to form and establish affinity and complement between the different present visions, therefore, also between resulting articles. The clear identification of the blocks that would

constitute the book and the responsible of each segment was chosen during the reunions till reaching to the definitive proposal of the summary.

In the year of 2007, the VIT gave a basic step for the reinforcement of its network of researchers realizing the first virtual workshop on tourism and social development. This meeting congregated the associate researchers to the Institute in a form to promote academic reflections and to contribute for the diffusion of new ideas. Moreover, it deepened the questions to multidiscipline that involve the orienting subject of the project, betting in the use of information systems and virtual tools of collaborative communication for the production of knowledge in a shared form, configuring a research network.

The workshop was promoted by the VIT and organized by the courses of tourism of the Fluminense Federal University (UFF), Federal University of the State of Rio De Janeiro (UNIRIO), Agricultural Federal University of Rio de Janeiro (UFRRJ), course of Geography of the University of the State of Rio de Janeiro (UERJ) and the Masters Program of Hospitality of the University Anhembi Morumbi, beyond the Laboratory of Technology and Social Development of the UFRJ.

The idea of the workshop was the result of a series of meetings between these researchers, that, throughout five months had been debating the objectives of the workshop, its structure and organization, beyond the expected results. From these meeting five thematic axles prioritized for the workshop had been defined, respecting the interests of research of the institutions organizers, as well as the reflections and focus of the proper VIT. In this manner, each institution was responsible for coordinating, moderating and to define the activities developed in each one of the five thematic axles, namely: “Education, Research and Extension in Tourism”; “Tourism and Cultural Patrimony”; “Tourism and Environment”; “Management and Planning in Tourism”; and “Tourism and Hospitality”.

Its duration was projected for about one month, initiated with an opening meeting, carried through in 8 of August of 2007, and a closing meeting, carried through in 10 September of 2007, both in the audience of the UFRJ, in the Center of Technology of the Island of Fundão, in the city of Rio de Janeiro. The virtual period happened between 9 of August till 9 of September of the same year.

The experience of the first Virtual Workshop on Tourism and Social Development extended the integration and production of knowledge, where the bred relations and the gotten results were already promoted in 2007, an attempt of the collective project of research between the organizer entities, is the intend to make an effect in the year 2008. The perspectives of animation of the network by means of the virtual tools of collaborative communication had also stimulated the VIT to reorient its planning. To the foresights for the year 2008, wich are among others, a re-launching of the electronic animation and activities bulletin of the VIT for forums of debate in interesting subjects, connecting the network of VIT with other existing networks already active in the subject of community tourism.

The result of the workshop was available on the net, since the texts that had served as base for the debates, were passed for an audio-appearance apprehension of the lectures, until the results of the forums and chats, as well as the resultant thematic texts synthesis. The tool developed for the accomplishment of this workshop was incorporated in a permanent platform of the VIT, having made possible that the Institute carries through and houses similar events to the one above. The available bibliographical references in the media of the Internet had been available for the event and are being fed periodically in the VIT, with the contribution of the actors of the network.

6. Considerations and appointments for the Virtual Institute of Social Innovation

The Virtual Institute of Social Innovation (VISI) is a virtual space for debate and construction of proposals related to the social innovation in Brazil. One is about an initiative of researchers of different areas and universities of this country to connect by means of a virtual platform of collaborative communication. With this tool in hands the Institute considers arguing the role of design in this process by means of the formularization of a methodology compromised to situated and sustainable development (Zaoual 2006).

The VISI is fruit of debates that took place throughout the *Design, Social Innovation and Sustainable Development* Seminary, carried through by the Program of Production Engineering of UFRJ, with the support of the High Studies School of the brazilian government agency for post gratuate studies (CAPES), in September 2007. In this meeting there were diverse universities present that, where arguing the methodology presented by Professor Ezio Manzini on creative communities and sustainable lifestyles, it presented the interest in deepening this vision in the Brazilian perspective. From now on, the efforts for the creation of a virtual platform was beginning that allowed continued debates independent of actual meetings.

In this form, taking of the previous experience in the management of the Virtual Institute of Tourism, the Laboratory of Technology and Social Development of the Program of Production Engineering of UFRJ organized the necessary infrastructure so that initially the 17 institutions that had been part of the creation of the network collaborated permanently in the comprehension of social innovation in Brazil.

In November 2007 the group of researchers made a first virtual meeting of debate for the planning of activities for the VISI, involving the initial researchers of the formation of the network. From this meeting some priority fronts of action had been defined, as well as points to be considered in medium and long run periods. The first actions indicate the concern of the group in lining up a common understanding of what it is understood as social innovation in Brazil and, moreover, collect cases, to elaborate key criterion for the identification of socially innovative cases.

Defining these lines of immediate performance, the participants exchanged texts and opinions, making it possible to delineate a first theoretical reference on Social Innovation to guide the actions and debates of the VISI. This first version - that is in permanent construction by means of feedback with practicality - was divulged between the members by means of the “VISI Newsletter” – created to facilitate the circulation of qualified information between the members of the network - and comprehension of social innovation as a process of recombination of elements that implement, fortify or restore relational standards .

It fits to point out that, when making a link between social innovation and relational standard, the basic aim is on which type of relation is in debate. In this case, the relational standard is identified by its direct, approximate and accessible dialogical attributes.

The second line of immediate performance, is proposed as a parallel development to the first development, initiating the collection of considered cases as social innovation for the members of the network. The proposal is that the debates for the definition of criteria of identification of cases of social innovation are strategies of animation considered for the network, so that the movement feeds the constant survey of cases. Its fit to point out that the objective of the network is not to collect cases of Brazil exclusively, but to have a qualified analysis from this point of view and comprehension of social innovation in the brazilian context.

Still in embryonic process, the VISI intends, to go beyond the promotion of academic debate on the theme in question, to stimulate the exchange of experiences and the interchange of information between socially innovative initiatives, incorporating directly in the network involved social actors in the identified cases of social innovation.

From the reflections generated by practice the VIT makes it possible to conclude that the VISI did not only consist as a enabling solution – to make it possible to reach to results - but also as a enabling platform, promoting a space of sharing of effective practices (Manzini 2007). With this as base we consider the growth of VISI in two perspectives: the first one to the public of

researchers interested in the theme of social innovation in the most diverse areas of knowledge; next to the directly involved actors in the cases of social innovation.

This first perspective is important in fact for VISI to count on the researchers of the 17 institutions that have participated in the *Design, Social Innovation and Sustainable Development* Seminary and that in this form they have created a network. However, the social innovation theme needs to have a transversal character in diverse areas of knowledge wich is basic so that they can add to design other forms of comprehension and analyze this subject, enriching to the look and extending the reach and depth of the production of knowledge in this respect.

The second perspective, in turn, is the axe that will allow VISI the visualization of its transforming potential. This because, the force necessary to take in to account for this task is on a contract basis and has as focus the generation of a network of sharing of experiences, practices, challenges and solutions in a day-by-day life of the innovation cases. This action will not only contribute for the improvement of these practices, but also will allow the generation of a quantity of practical effective cases and a reference for new initiatives. Moreover, another quantity in permanent construction will be generated to divulge knowledge from reflection proceeding from this partnership between university and society.

Other actions already developed by the VIT can inspire the VISI in the mobilization, and dynamize the searching management of the network associates. To think about the structure of permanent animation of the network, about the models of virtual workshops promoted by the VIT, elaborating key subject and facilitating the debates using some collaborative tools of the platform, can represent an important means to ferment the conceptual debates around the theme of social innovation. Articulated in this proposal, is a vehicle of diffusion of this knowledge in a scientific periodic.

These are, for the time being, only some ideas of performance for the VISI. However a concrete action already is in course: the production of a book contending reflections of Brazilian researchers, generated from the seminaries lectured by professor Manzini. This publication will involve, the members of the network of associates researchers and the contribution of other Brazilian researchers with vast experience in the social innovation theme in more economic and technological boards.

The road of the VISI is fertile, but still we are initiating the passage. As an open process it is still in construction the participation of all is very welcome. Thus, we invite you, to read this article, and be part of this path. Please enter in contact with us and the associates of VISI. The address of our virtual site is <www.ivis.pep.ufrj.br>. We await your contact and contributions.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

DESIGN (x) DIASPORA

- implementing sustainable development in developing countries

Jan Capjon[1] and Håkan Edeholt[2]

Abstract

This paper attempts to raise some basic questions and indicate some possible resulting strategies. Inspired by migration studies it is suggested that emigrants' connections to locations of origin could form a basis for sustainable structures and development based in high/low-tech integration and design competence.

Through integrating Design and Diaspora, one can avoid merely transferring technologies from the west to 'developing' countries and instead: (i) leapfrog fundamentally unsustainable solutions of 'developed' countries', (ii) develop products that *either* are designed to be appropriate for the local context *or* designed in order to utilize the local context's comparative advantages, and (iii) at the same time approach a profound commitment grounded in the local social context.

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Introduction

The term *sustainable development* stems from the Brundtland Commission of 1987.[3] The Our Common Future report proposed to approach development through holistic contexts; the fight against poverty, the implications of social and cultural factors and the ability of environments to meet present and future needs were all central.

Publications on the topic of design for developing countries has since then been rather modest, but have increased during the past few years. This may indicate a growing concern within the design field, that in a world with decreasing abilities of developing communities to meet future needs, the challenge of sustainable thinking is escalating. Current dissemination contains a lot of illustrative and potentially interesting approaches to design for development – both in terms of new products and new processes [Manzini and Jegou (2003), Wimmer, Züst and Lee (2004), Greffe and Pflieger (2005), Maase and Dorst (2006), Tukker (2006), Charter and Clark (2007), Vezzoli (2007), Meroni (2007)]. Such exemplification is in accordance with designerly ways of meeting challenges. But in addition, an intention of making new solutions durable more than anything seems to require that we focus discussions on what we apprehend as *fundamental* questions. In hoping to inspire needed discourse, we have attempted to suggest some root problems.

Victor Margolin (2006) approaches the problematic from a basic position. He presents the limited history of design for development, which can be characterized by a tension between a low-tech crafts approach on one side and a more high-tech impulse on the other. The low-tech impulse was originally suggested by Papanek (1986) and is based in local needs and on present local and traditional production structures. This approach is aimed at community survival more than at national development strategies. The high-tech impulse is based in the Ahmedabad Declaration on Industrial Design and Development (National Institute of Design 1979). The declaration emphasises the importance of design to a nation's economic development, and it proposes that 'developing' countries (as the term indicates) should adapt similar industrialisation strategies as 'developed' countries. Bonsiepe (1991) builds on this document when he emphasises the important role that design will have to play in industrial development of peripheral countries. Margolin argues that toady there is a need for design oriented theory which integrates multiple factors of trade, technology transfer and cultural expansion in the increasing complexity of globalised practices.

The low/high-tech dichotomy appears as a valid description of basic historical impulses in design for development. But Margolin and Bonsiepe refrain from addressing the problematic in framings that exceed the boundaries of traditional industrial design thinking, where complexity patterns of infrastructures and social preconditions for development are rarely included. How shall "integration of multiple factors" in design impulses for developing and developed countries be understood? The differentiation appears as clear-cut, but how should the gap *between* the polarities be seen and approached? Let us coin the missing link *the lo/hi-tech design challenge*.

In alignment with Margolin we suggest that the lo/hi-tech design challenge can serve as a platform for building sustainable design thinking. However, we propose to basically expand the scope of vision in search of some social and cultural understanding of how low and high technology can be integrated and how involved development actors can collaborate towards such integration. Three questions are at the forefront:

(a) can *socioeconomic structures* with potential for making development sustainable be identified?

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[3] WCED-World Commission on Environment and Development (1987) *Our Common Future,* Oxford Univ. Press.

(b) can *principles for interaction* between 'developing' and 'developed' technologies be suggested?
(c) can practical obstacles be overcome through appropriate *development strategies*?

In order to extend our vision we have searched for correlates within other fields of inquiry and have eventually demarcated three tentative strategies:

(a) ***Migrant remittances*** – as an important source for transferring relevant knowledge and funding to developing countries in a sustainable manner
(b) ***Leapfrogging*** – as an efficient approach for developing countries to 'catch up' and become globally competitive based on their own merits
(c) ***Design-driven strategies*** – as a crucial complement in order to facilitate required communication and that both products and production are in tune with local conditions

We will briefly address these for identifying, strengthening and expanding practices of sustainable development.

(a) Migrant remittances

Internationally a central challenge is that the effects of development aid programs often collapse after donor funding has been spent. Indications are many that old ways of donating development aid need to be revised and that new strategies are called for.

A thought provoking example of a new approach to development can be found in Nobel Prize winner Mohammed Yunus and the highly successful Grameen Bank movement[4], which build durable enterprises from responsible credit schemes and shared ownership regimes. The Social Entrepeneurship (SE) movement[5] has similarly had a substantial world wide growth during the past few years based in the principles of defining a local problem and trying to solve it through establishment of a profit sharing firm (with network relationships) which fulfils a need. Kai Hockerts of Copenhagen Business School says: "with social entrepreneurs we face a radical change in the way we envision aid to developing countries".[6]

The basic principle which characterises these initiatives appears to be the establishment of *lasting responsibility structures*. Inspired by these movements, we have turned to a field of inquiry where the principle of lasting responsibility patterns may facilitate a relevant approach the lo/hi-tech design challenge: migration studies.

In research on the dynamics of migration and transnational practices the implications of emigrants' remittances (transfers of value) to their home countries are studied. Can such remittances and close family and community bonds to locations of origin represent a source for durable development structures?

Updated remittances research is funded by the Norwegian Agency for Development Cooperation (NORAD) and performed in cooperation with the International Peace Research Institute, Oslo.[7] The following statistics and elaborations are taken from Jørgen Carling (2004, 2005). The approach to these studies is "under what circumstances and through which mechanisms the development impact of remittances is *susceptible to policy interventions*".

[4] Schicks (2007).

[5] Bornstein (2007).

[6] Information, DK, Feb. 9th, 2008.

[7] www.prio.no/remittances

Table 1. Top-25 remittance-receiving countries by three definitions, 2002.

Remittances (USD millions)		Remittances per inhabitant (USD)		Remittances as a proportion of GDP (%)	
Mexico	9814	Jamaica	432	Jordan	20.5
India	8317	Barbados	372	Samoa	17.1
Spain	3958	Jordan	371	Jamaica	14.4
Pakistan	3554	Portugal	317	Cape Verde	13.6
Portugal	3224	El Salvador	302	El Salvador	13.5
Egypt	2893	Samoa	227	Albania	13.3
Morocco	2877	Dominican Republic	225	Yemen	13.0
Bangladesh	2848	Albania	204	Honduras	10.7
Colombia	2351	Cape Verde	175	**Nicaragua**	9.4
Dominican Republic	1939	Croatia	149	Bosnia-Herzegovina	9.3
Turkey	1936	**Guatemala**	132	Dominican Republic	9.1
El Salvador	1935	Bosnia-Herzegovina	126	Morocco	8.0
Jordan	1921	Ecuador	112	**Sri Lanka**	7.8
Brazil	1711	Greece	111	Guyana	7.1
China	1679	Tunisia	109	**Guatemala**	6.8
Guatemala	1579	Honduras	104	Tajikistan	6.5
Ecuador	1432	Mexico	97	Sudan	6.3
Nigeria	1301	Morocco	97	**Uganda**	6.3
Yemen	1294	Spain	97	**Pakistan**	6.0
Sri Lanka	1287	**Nicaragua**	71	**Bangladesh**	6.0
Indonesia	1259	Yemen	70	Ecuador	5.9
Greece	1181	**Sri Lanka**	68	Tunisia	5.1
Jamaica	1130	Guyana	67	Mongolia	5.0
Poland	1109	Belize	55	Togo	4.1
Tunisia	1071	New Zealand	54	**Nigeria**	3.7

Bold font indicates Norway's partner countries. The figures refer to workers remittances. Source: International Monetary Fund (2003).

In 2007, registered remittances to developing countries grew to 240 billion USD, which was more than two times official development assistance means.[8] A large unknown sum is additionally transferred through informal channels or to countries that do not report to statistics.

Emigrants' motivations for remittances vary: "when migrants do invest, their emotional attachment to their (often marginal) regions of origin can help compensate for the disadvantages of these regions in the eyes of purely profit-seeking investors". Motives for remitting have been suggested by development economists: *altruism;* meaning care for receivers, *self-interests;* referring to possibility of heritage or community resources, and *insurance;* involving sharing of parts of income. Remittances can be understood as "intra-family obligations being sustained despite the geographical separation of the family". Female migrants often earn less than males, but possibly remit a higher income proportion. Respect and status in an origin community is held to be a motivation factor. Generally it is believed that remittances of individual migrants tend to decline over time.

[8] Migration and remittances fact book 2008. World Bank.

The division of remittance expenditure between investment and consumption has been discussed in the literature on migration and development. Researchers and policy makers in the 1970s and early 1980s were concerned with the small proportion of remittances that were used to set up small businesses or for other forms of 'productive' investment. Recently 'consumption' items such as health and education have been seen as investment in human capital – and increased consumption by the poor has been seen as poverty alleviation, which is a goal in its own right. The view that remittances are hard-earned money that migrants and their families should be entitled to spend as they wish has eventually become widely accepted.

Carling distinguishes between four kinds of benefits from remittances. (i) Intra-family transfers have *immediate benefits* which contribute to daily basic subsistence needs, but may not have sustained effects. (ii) If the recipients manage to save or invest remittances, it may result in *future benefits*. (iii) Benefits may or may not extend to *secondary beneficiaries* in the community if remittances are spent on locally produced goods or services, e.g. construction works. (iv) Finally, remittances can contribute to *remittance-independent development*, like setting up local enterprises, which is the desirable form of investments because they sustain livelihood independent of future remittances.

Abbreviated resulting policy recommendations of how the Norwegian Ministry of Foreign Affairs (MFA) and Norad best can contribute to increasing the benefits of remittances to poor countries (in collaboration with government agencies, civil society, private sector, partner governments, international development agencies and multilateral agencies) are:

- support immigrant's opportunities for sending remittances and/or doing business in their countries of origin
- promote transnational entrepreneurship among immigrants
- create opportunities for reasonable and reliable transfer mechanisms and promote tax exemption for gifts to charitable organizations in developing countries
- promote development initiatives in migrants' countries of origin
- work with microfinance institutions in partner countries to promote linkages between remittances and microfinance
- collaborate towards formulating and implementing sound policies to increase the benefits of remittances
- promote the exchange of ideas and experiences of engagement with remittances and diasporas
- support the ongoing work on migration, remittances and development and cooperate on specific initiatives in partner countries.

In addition to these recommendations, in Norway it is presently being elaborated if migrant remittances allocated for local enterprise investments can be expanded through development aid means, for instance on a 50/50 basis.[9] Such arrangements could significantly motivate remittances, but convincing project propositions are needed.

The above policy recommendations and actions, according to our view, can represent a highly interesting socio-economic grounding for lasting responsibility structures – as a platform for making development sustainable. Their authors invite to interdisciplinary intervention. In accepting this invitation and building on above elaborations, some potential root-premises for design for development can be suggested:

- a new strategy for sustainable development should have its foundation in the principle of durable responsibility structures

[9] A 50/50 pilot project in Pakistan is prepared by the Ministry of Foreign Affairs.

- responsible new enterprises can be created from the principle of ownership which is shared between the central actors of a project
- a promising durable ownership source is migrants to western countries with close family and community bonds to locations of origin and a desire to remit means
- in well planned enterprise suggestions with ownerships structures involving immigrants to western countries investment motivation can be increased through additional development aid funding.

How, then, can enterprise suggestions become well planned and convince potential investors of how they could grow beyond consumption and self-interest? From the cited research it seems likely that big changes will take place within these sectors in the near future regardless of whether or not the design aspect of the challenges is acknowledged. But the challenges to design inquiry appear as obtrusive once they are seen in the referred light of contemporary policy making. What are the practical aspects of the challenges?

(b) Leapfrogging

The Oslo Manual: guidelines for collecting and interpreting innovation data (OECD/European Communities 2005) gives a realistic account of the highly complex practical obstacles for development intervention. Some abbreviated characteristics of innovative premises and processes in developing countries are:

Exogenous factors are characterised by:
- Macroeconomic uncertainty, instability, lack of infrastructure (electricity, communication), lack of innovative awareness, risk-averse enterprises, barriers to start-up, lack of public business support and a seemingly small local market for high-tech products
- Dominance of multinational corporations result in less local decision making and that the fundamental source of innovation typically is based on technology transfer
- Weak information flow and linkages between science and enterprises challenge the capacity of firms to overcome problems

Endogenous factors are characterised by:
- The sector of privately owned, informal and relatively small SMEs is significant. These companies typically lack resources for innovation
- The sector of state-owned or parastatal, formal and relatively big enterprises is also significant. These companies typically lack competition and are often bad innovators
- There are high barriers to accumulation of formal or tacit capacities in companies

As a result developing countries tend to compete with cheap labour rather than with efficiency or differentiation; and with incrementally changed (or copied) products rather than with radical innovations utilizing comparative advantages available.

These accounts illuminate different important challenges. Especially the need of local learning, production adopted for local conditions and establishment of new kinds of infrastructures for both technology transfer, in itself, but also for development of local more advanced markets.

Our assumption is that we today have a historical window of opportunity where new technologies can facilitate important leaps forward. We suggest that it is possible to make our future more sustainable in all dimensions of the Brundtland Commission report (WCED 1987) if we are able to reinforce *leapfrog technology*[10] tendencies already flourishing on the market today. However, such a move requires that we are able to change our mindsets regarding 'developing'

[10] Leapfrog technologies can 'over-leap' or sidestep technical solutions made for other preconditions than we have today.

countries, acknowledging that that is exactly what we all need to become, and that we actually both can learn from leapfrogging tendencies spearheaded by developing countries and reinforce their impact. Therefore we allow ourselves three summarily described examples of emerging leapfrogging possibilities where Norway both have useful competence and more short-sighted interests to defend:

Leapfrogging traditional electrical grids

In 1994 a cluster of Norwegian companies[11] with competences within silicon rectification and wafer production started an R&D initiative, which today has resulted in a world leading position as sun wafer producers. Hanson & Wicken (2008) describe how the global need for renewable energy resources has propelled this initiative and given high national support along the way. Sun cells for electricity production do not generate emission or sound, can be installed (decentralised) at the location of use, have no moving parts and have a minimum of service need and long durability. In 'developed' economic terms they cannot compete with traditional electricity sources, but their production price is expected to be halved by 2015. In 'developing' economies the calculation will appear differently, as the principle of decentralisation and elimination of infrastructure altogether present highly relevant leapfrog opportunities for design thinking, without initially interfering with 'developed' base component production principles. The application of wafer cells in local developing communities call for intervention and rethinking on the topic of basic user needs and can promote new kinds of high-tech applications that use less energy than the ones designed for 'developed' countries do.

Leapfrogging traditional sewage systems

2,6 billion people do not have access to adequate sanitation and a child dies every 15 seconds from water-borne diseases.[12] 2008 is the UN international year of sanitation proposing a millennium development goal of halving the proportion of people without basic toilets and hygiene facilities by 2015.[13] Can the extremely costly infrastructure-based sanitation solutions of 'developed' countries be leapfrogged? Scandinavia is pioneering sustainable solutions to wastewater treatment, and several appropriate technologies for low-cost decentralised systems have been developed. Jenssen, Vråle and Lindholm (2007) write: "A variety of watersaving and urine diverting toilets can nearly halve water consumption. Toilet waste (blackwater) or urine can be collected separately. Cotreatment of blackwater and organic household waste yield both energy and hygienic fertilizer and handle all organic waste from the household in one waste stream. Water from showers, sinks and kitchen (greywater) can be treated in a variety of systems. Treated greywater is suitable for irrigation, groundwater recharge or as a source of potable water production. Utilizing the latter, more than 90% water saving is possible. Source separation (blackwater/greywater) systems produce near zero emissions." New innovations of western universities represent powerful leapfrogging possibilities, but their introduction in developing contexts involve several social issues where methods for designing the 'user-technology-interface' will be crucial.

Leapfrogging traditional business models

An example which highlights the leapfrog problem from a social rather than technology perspective is the development of new hearing aid technology by SINTEF.[14] One aspect of advanced hearing aid technology is the infrastructure which has emerged in its wake in developed countries; the specialists needed to adapt and adjust the technology. New high-tech innovations have allowed automatic adjustment of the devices and eliminated the need for instruments and know-how. These innovations are obstructed by the specialits' organisations that

[11] Renewable Energy Corporation (REC), Orkla, Elkem, Hydro and Norwegian Silicon Refinery.
[12] Source: UNDP 2006.

[13] Sanitation now. 2008. A magazine on the global sanitation crisis. Stockholm Environment Institute.

[14] Reported in Teknisk Ukeblad, no. 31:12. Nov. 19th, 2004.

protect their craft interests. So effective has this obstruction been that it has blocked the introduction of the technology to the market. The end of the matter is that there is only one potential market where the technology has access: developing countries, where it is now being adapted according to its basic low-cost potential *because* there is no infrastructure to handle adjustments. However, just as in the previous example, in order to be successful without any person mediating the technology, the design of an appropriate interface making the use of the technology both evident and socially acceptable is crucial.

These few examples (among a multiplicity of other possibilities) are not meant as project propositions. They are illustrations of opportunities that could be realised through employment of a leapfrog principle with inherent capacities of mediating innovation in interaction between developed and developing countries. We have attempted to suggest root-problem approaches to responsibility structures and technology mediations. Can some similar approach finally be proposed as to how all the obstacles and challenges of practical projects could be met?

(c) Design-driven strategies

The Oslo Manual displays some of the preconditions for innovative development scenarios; only incremental change culture, minimal innovative awareness among actors or future users, minimal public knowledge and support of initiatives, small local markets, suffocation of local initiatives through multinational enterprise/capital domination, high barriers to formal or tacit knowledge regimes – in addition to serious infrastructure deficiencies. How can attempts to solve such severe problems be practically arranged and how can design thinking contribute?

Since Papanek and the Brundtland commission the sustainability focus has been on the local community and its ability to meet present and future needs. Local communities have their material context – and they are inhabited by potential contributors to their own development; the future *users* of that which is developed. Local development actors (or their emigrated representatives) basically know the local preconditions for development, but they lack the input factors characterising updated development processes. If such a process has an intention of being innovative (new product solutions and their commercialisation), local actors will need supplementary stakeholders of many specialised competences. We then arrive at collaborative scenarios that will involve development actors of diverging interests and competences. As an example a project can include representatives for socio-economic interests (e.g. emigrants), public authorities, technology competences (e.g. leapfrog), local interests – and (tentatively) design competence. Objectives of a project could be to develop innovative solutions to local design problems that will comply with sustainable claims – and that can be applied elsewhere if successful.

Regardless of the particular project, whenever collaborating it is important to see the participants as actors in an ‘ecological system’ having *different and complementary* qualities. Arguably, the kind of result we can expect from a certain project is to a high degree determined by the composition of the actors acting in the ‘system’ and what kind of qualities the system allows to flourish. When comparing design to other relevant disciplines within product development some typical characteristics will stand out particularly sharp:

(i) designers work in the interface in-between technology and the user, making sure that the product makes sense in his or her use-situation
(ii) designers are used to making the most out of the technology at hand and available production core competencies
(iii) the methods designers typically apply when ‘solving problems’ tend to be reversed

compared to other's by being solution- rather problem driven[15], and finally

(iv) designers are used to communicate through physical models easily understood in-between disciplinary and/or spatially dispersed cultures

In the context of sustainable product development in developing countries these qualities seem to be of utmost importance as they all appear to approach apparent problems within present development work. However, a profound conceptual understanding of the last two ones is perhaps giving the most fundamental urge for a change on a concrete, and more, instrumental level; i.e. how *solutions* seen from primarily a user perspective can feed into a system with experts driven by, primarily technical, *problems*, on one hand, (i.e. the engineers) and primarily economical *results* (i.e. economists) on the other (Edeholt 2006 a,b). And, finally, how this interaction can be facilitated by refinements of established 'design tools' (Capjon 2004).

A collaborative scenario example like the above one can be approached through multiple alternative processes.[16] Can some productive core principle be identified that can basically support them all? The scenario involves actors of diverging cultures, norms, values, preferences and *languages*, and a main objective of an innovative process will be to find a way to engage all actors regardless of background. There is interdisciplinary agreement on the importance of employing *material representations* of emerging ideas in collaborative processes. Physical models can have inherent abilities for enhancement of communication, support of ideation and development of shared meaning.[17] Jacucci and Wagner (2007) have studied the performative roles of materiality in collective creativity settings. Their inquiry reveals a distinct shift in focus from verbalised articulations, written words and intellectual meaning to the multi-sensory dimensions of human-made artefacts. They hold that "more and more studies draw attention to the performing body, to spatiality, and to the haptic qualities of physical artefacts as crucial for interaction, experience and understanding."

The principle of employment of material representations to engage and negotiate between mental differences can thereby be suggested as a fundamental approach to enhancement of innovative interaction in collaborative teams. This is a generalised conclusion – implying that it is applicable in 'developing' as well as in 'developed' contexts.

These general principles can be extended to a strategy for stimulation of sense-based communication[18]. In iteratively repeated physical experiments and following negotiations technological possibilities, functional properties and aesthetical approximations can be integrated. Diverging mentalities and preferences of the team actors can be gradually adjusted – and shared experiences can generate learning leading to unconventional solutions. Creative impulses can in such scenarios survive the meeting with complicating technological and functional realities, and focus and growing understanding of user aspects of many alternative solutions can be maximised. The designer's role is central for such collaboration, since (s)he is closest to the integrating and form-giving aspects of the solutions – or functional surfaces where oppositions tend to collide. A metaphorical process model has been developed to facilitate understanding. The central stage of a process is here called *Negotiotyping,* and the other stages are called *Visiotyping, Prototyping* and *Seriotyping.* The team stakeholders have individual mentalities (leaves) in formative and adaptive modes, but they share the physical models experienced in shared contexts (junctions in the plant's stem). Some branches lead to breakdowns, but one eventually gives a negotiated concept. If the extreme capacities of the Rapid Prototyping (RP) tool for production of material

[15] See e.g. Lawson (1997)
[16] Examples are plentiful in Changing-the-change proceedings.
[17] Such material representations, including drawing on paper, have been given many names: Star (1991); *boundary objects,* Henderson (1995); *net-organizing devices,* Perry & Sanderson (1998); *procedural artefacts,* Brandt (2001); *things-to-think-with,* Boujut & Laureillard (2002); *intermediary objects,* Bucciarelli (2002); *linguistic artefacts*. [Ref. Capjon (2004)]
[18] Capjon (2004).

representations are systematically employed in this regime, a highly engaging, efficient and time-saving process can result.

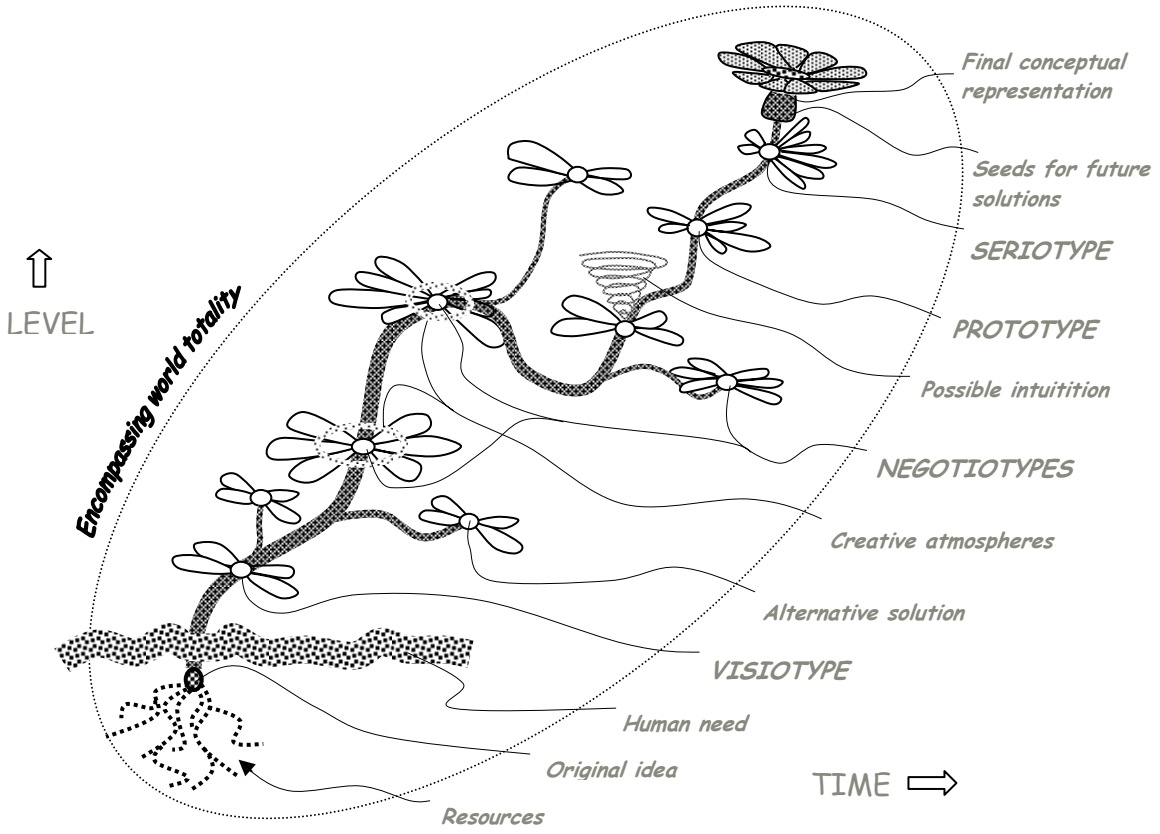

Fig. 1: PoEM – The Plant of Emerging Materiality model

Application of solution-driven principles and a materiality supported development strategy to 'developing' contexts may involve advantages compared to more traditional approaches.

- Idea generation and communication between actors of widely diverging cultures, values and languages can become highly effective through material stimulation
- Solution concepts emerging in the process should be tested and experimented with in their real-world environment and iteratively changed according to hands-on learning
- Acceptance barriers of new concepts with designs adapted to local (not 'developed') preconditions may be gradually overcome through shared sense-based experiences
- There are good possibilities of integrating local technologies (engaging local labour resources) and high-tech leapfrog technologies impossible to produce locally
- If RP facilities can be operated in or close to environments of use, great distances between development actors need not represent high obstacles
- High risk involved in innovative solutions can be substantially reduced through physical RP-based testing before acceptance or rejection

A possible scenario founded in a leapfrog philosophy can be envisioned. *Co-labs* can be fitted with all necessary equipment for material and digital facilitation of collaborative development processes including power supply, updated ICT technology and an RP aggregate. Inseminated through potential migrant partnership, containing a bank of leapfrog technology opportunities and successful local case-stories, and operated by trained development facilitators, such units could initiate and support locally adapted development projects. Labs can be located at universities or in central places, but if they were mobile (e.g. in appropriate trucks) they could cover large areas regardless of non-existing infrastructures. Connections to collaborating development actors in world-wide locations can be arranged through net-based services (physical Negotio- and Prototypes can be exchanged wirelessly). Such units could be equipped with the latest Selective Laser Sintering (SLS) technology, where different materials can be materialised, including steel. *Co-labs* could then additionally supply spare parts to broken down machinery, products, farming equipment or the like (a huge problem in locations without infrastructures). Such Rapid Manufacturing (RM) technology could represent a unique possibility of producing diverse components – through the air, from virtual sources and materialising at the location where they are needed.

Conclusions

Initially we posed three questions based on what we have coined the *lo/hi-tech design challenge* of developing countries. The issues were; sustainable social structures for development (i.e. a), underpinned by alternative modes of technological transfer (i.e. b) and adapted design methodologies (i.e. c).

Based on these questions we have tried to combine competencies, needs and ‘driving forces’ from different fields and/or disciplines. Through such an approach we believe that we can make development work more efficiently and sustainably. Additionally, we believe that we can utilize some comparative advantages inherent in ‘developing’ countries, based on the fact that we all need to develop in radically different ways compared to the blind alley ‘developed’ countries have eventually ended up in. As a consequence we, in fact, see the developing countries as a possible source of highly needed new solutions, and the ‘developed’ countries as the problem – not the other way around.

However, more research is required in order to know whether these rather speculative inputs actually can ‘change-the-present-change’ in a positive and more sustainable direction. Therefore, as a final request, we would like to use this conference as an opportunity to invite anyone interested to continue a discussion along these lines and see whether we can ‘change-the-change’ by joining forces.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

DESIGN DIRECTORY [ITALIA]

A strategic web-tool for the Italian design system

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Abstract

Design Directory [Italia] is a research project promoted by Triennale di Milano and carried out by Dipartimento Indaco of Politecnico di Milano. It is also a tool to map the Italian design system (including companies, professionals, publishers, culture, schools and research), which, by visualizing information, allows to represent, interpret and share the system. It is a “mechanism”, a a simple service design tool which wants to become a winning action and a cultural activity aimed to stimulate the creation of social networks, the participation of all the actors and the co-creation of contents. All this by using the web 2.0 approach.

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1. Design and system: an evolving process

Design represents one of the main characters of the Italian territory. Recently the design profession has seen some changes. The “heroic” phase of Italian design has ended (the years of the best Italian designers such as Magistretti, Munari, Castiglioni, etc.), and a more spreading one has started, in which the number of actors involved in the design system has significantly raised: design schools have proliferated, as well as associations, magazines, exhibitions, design-oriented companies, and Italy, especially Milan, has established relationships with the international capitals of the design culture production. At this moment in time, when a lot of changes are taking place, design can, once again, represent for the territory a sort of guidance to support the dialogue and competition among regions and their production and cultural systems. (Bonomi 2006)

Furthermore, design represents a strength for the Italian economy. It represents a production field comprising of design activities, education and publishing activities, cultural products, places, events, as well as a general orientation toward business. Italy, and especially Milan, represents in this sense a worldwide known and appreciated brand: for this very reason it needs to be acknowledged and leveraged. (Simonelli et al. 2002)

The design system is evolving and currently comprises, more then ever, new profiles which dialogue with the advanced design requirements, counting on a solid and significantly wider offer. The system of the design professions gained the current importance because it was initially supported by a production system, the Italian one, which largely experimented design in several successful collaborations. It is possible to affirm that the business system as a whole grew within a design “shared atmosphere”. Design is mainly inclined towards some sectors because of the historical relation with part of the Italian industry, as well as the repeated collaboration between designers and entrepreneurs. Furniture, lamps, objects and clothing, as well as machinery and transport, lead the Italian companies and the designers they collaborated with to the worldwide reputation. (Arquilla et al. 2005) On the contrary, it is currently difficult to have a clear picture of the design professions; for example, there isn’t a professional list to refer to like engineers and architects have, and the relations and professions sees many activities and specializations.

It used to be possible to talk about design structures, now it is possible to talk about design networks, comprising of small professional studios that deal with parts of the design process and collaborate with other small studios (Simonelli et al. 2002) and with other actors of the systems. The network of relations gets wider and becomes a mesh, a combination of links, and the designer can create design relations, gathering for each project the right skills to answer to the client’s need. This is one of the most interesting aspects of the Italian way of working. The system of professionals on a given geographical area has been internationally connected for quite a while, working for foreign companies and for Italian companies on foreign markets. Many talented young professionals come to Italy. The result of these exchanges is a fruitful dialogue which generates advanced innovations both in the products and ideas world. Schools, fairs, publishers, cultural institutions, and all the new aggregation places on the urban and national area activate those prolific exchanges, not only the companies. Italian design is characterized by a systemic and a sectorial coexisting aspect: from one side design resources, activities and competencies are tied to a set of different resources, activities and competencies which belong to different overlapping and interacting layers; from the other side the sectorial aspect is crucial to investigate, understand, interpret but most of all support the design phenomenon.

High priority is given to the investigation of the system’s structure, the definition, so to speak, of its form and the understanding of its functioning and relations among the actors. To this regard, the research allowed us to sense the more profound nature of the complex system comprising the Italian design and fhe fact that it is defined as a favorable habitat for the plurality

of the systems it comprises of. We believe it is important to carefully follow the dynamics that have recently led to the reorganization and change in the production system.

2. The ‘production room’ of the design system

The different systems that revolve around design are often represented by micro or macro design organization, production processes to which the designer belongs, often with a “direction” role. These “creativity processes” express the capability of a geographical area to become a privileged place for the design culture. The designer becomes the strategic point of the system. Thus, the professional isn’t a single unit any longer, but he represents a hub, the “production room”, in the network which builds relationships and collaborates with the other actors involved in the process. The actors of the process are the education system, the publishers, the companies, the suppliers, the manufacturers (prototypers, printers, etc), the associations, the cultural and exhibitions systems, the research. The system of relations of the Italian design is represented by the systematization of the resources and competencies. The designer is compared to a director which has a vision, an idea, and that is capable of translating this vision in an integrated and consistent project, while enabling the relation among several actors in the system. (Pacenti 1998) The Designer becomes a director especially thanks to his inborn capabilities, described as follows (Zurlo 1999):

- *organization and coordination skills*: the capability of coordinating, “orchestrate” and systematize the resources and the actors, being able to interpret and mediate the different specific languages of the several actors’ professional fields involved in the project development;
- *negotiating skills*: negotiation is needed in any creative process. The design culture, for its systemic vision and the multidimensional approach to problem solving presents a stronger negotiation skill than other professions;
- *connection and “translation” skills*: design becomes a tool to manage and integrate different resources to enhance the efficacy and effectiveness of the design solutions. The multidisciplinary education of the designer and of the design manager especially, the ability to understand and act as a “translator” and coordinator, the central position in the system, the ability to synthesize and visualize become the precious tools available for the whole design system;
- *communication skills*: the designer has the competencies and tools to visualize the processes and communicate the project potentials outside the system. The designer acts as an interface with the actors of the system;
- *innovation* skills: subversion isn’t intended as negative: it defines a specific ability in being able to eliminate cultural prejudices or inactivity in seeing things; it means to use a point of view which isn’t the conventional one, and to be able to foresee what’s new and useful (for the company, the society, the environment).

These skills were developed and transformed in time, thanks to the social, economic, market and technological changes which led to the definition, re-articulation and implementation of the designer’s new capabilities. The direct relation between designer and company changes, and there are several actors with more specific skills which take part into the design process. The designer becomes the activator and actuator of strategies to create shared agreements. Thanks to the evolution of the education system new disciplines find birth, which gather these thoughts together. Strategic design for example is a design activity focusing on the system of product, service and communication (the product system) with which an actor (company, territory, etc) gets on the market, is placed in society and shapes its strategy. Other disciplines are service design, design management (Triad Project 1990) and design coordination (Henrion and Parkin 1967), which define the designer as the director of the system.

3. The numbers of the design directory

To map the whole of the activities and professions ascribable to design wasn't easy, as many professions and activities non clearly codified, but still existing and rapidly growing, are linked to the word "design". Italy is extremely rich and fruitful as regards the design "production". Thus, the research had to define a method and some criteria to identify and select the actors belonging to the design system. The criteria have to be valid, and to validate the system. As there were no specific researches and references to associations, the numbers of the system were defined at a twofold level: both the "emerged" (acknowledged sources) and "submerged" (acknowledgeable sources) parts of the design system were identified. The emerged part is mainly and naturally investigated from above (who is o makes himself visible, who is or isn't subscribed to…,who is part of…., who has to complete certain paperwork…): it is a visible, represented and known world. The submerged part is investigated with a different modality, as it is not officially acknowledged; though, if well addresses and circulated even through policy actions, it represents the real novelty, where an incredible potential for system innovation lays.

The categories allowing to break down the "design" aggregate in consistent subsets have been defined, and 7 systems emerged: 1. Companies and trade associations; 2. Designers and design associations; 3. Schools; 4. Research centers; 5. Fairs and exhibitions; 6. Publishers; 7. The cultural system.

To find "design companies" was not easy, for two main reasons: the fact that an official inventory of the "design companies" doesn't exist, and the fact that all the companies of the made in Italy sectors (or even just the furniture/home related ones) seem to be somehow defined as design oriented companies, for the kind of products they produce. Actually, this is a partial and inaccurate result. The research aimed to define a method to identify companies that are part of the design system: through tests, collaborations with R&D centers within the companies, events promotion, competitions, awards, publications. The factors taken into consideration are: to be published on the ADI Design Index lists; to have been awarded a special mention or to have won an international design award among the long-lived one (Good Design Award, Compasso d'Oro, Red Dot Award, Observateur du Design A.P.C.I.), in a given period of time (1995-2007); to be exhibited in permanent design exhibitions at prestigious international museums (Ney York MoMA, Triennale di Milano, London Design Museum); to promote design competitions aimed to influence the company offer or to use design as a communication lever or as a proof of a precise market policy, or where design can be seen as a qualitative or communicative term; to take part in fairs and exhibitions such as "I Saloni", "Abitare il Tempo", "Macef", where a strong trade component is merged with a design oriented profile and a contribution to the design culture is given (exhibitions, installations, shows, etc…). Starting from the identified criteria a selection was made, to highlight companies the excellence of which could be measured by using design variables. Around 1500 companies were selected throughout Italy, through acknowledged sources, and around 1000 through acknowledgeable ones.

Several actors which, under different names, in an explicit and implicit form, act as designers collaborate with the companies. The phenomenon and its dynamics were investigated at two levels. From one side the visible and known world was analyzed, meaning the "emerged" part of the professionals, considering the lists of the main national trade associations (ADI - Disegno Industriale [Designers Department], SIE - Ergonomia, ASPRONADI - Nautica di diporto, ANFIA - Industrie automobilistiche [Professionals], APIL - Associazione professionisti dell'illuminazione, AILD - Associazione italiana Lighting design, AIDI - Associazione Italiana di illuminazione, Lighting Accademy, AIPI Promes, AIPI - Progettisti in architettura d'interni, AIAP - Progettazione per la comunicazione visiva, ADCI - Art Directors, UNICOM - Imprese di comunicazione, Assocomunicazione [Advertising and communication and Digital Sectors], Federpubblicità, TP – Associazione italiana professionisti pubblicitari, ADICOM – Associazione italiana pubblicitari e designer, Camera Nazionale della Moda Italiana [Professionals], ADOR - Designer Orafi). The "submerged" part includes about 5.500 professionals working in the different design application fields, such as industrial design, communication design, interior and fashion

design. The regions with the higher numbers are Lombardy, with 1800 designers, followed by Campania, Emilia Romagna, Piedmont, Lazio and Veneto which count between 400 and 500 professionals on average. The three main associations have ADI: 850, AIAP, 530, AIPI 30 designers. Around 15% of the professionals are part of more that one associations. The other observation modality for the "submerged" part is less codified, but equally important to get a clear picture of the current trend of the profession. From this observation the importance of the sector investigations emerges, especially the 74.87.5 – design and styling for the design of textiles, clothing, shoes, jewellery, furniture and other house goods – which best represents the design world, comprising almost 10.000 professionals. Other acknowledged sources are books, websites, exhibitions and events which gather together and suggest lists of professionals, such as the Guida Index of the magazine Interni, which publishes around 2.500 studios, or the national ad international websites such as Design Boom, CORE77, Italiandesign360.com etc… which have 100 to 800 subscribers on average. Last but not least exhibitions and researches highlighting the phenomenon, such as The New Italian Design (exhibition at Triennale di Milano with a selection of designers under 35) and Design Roma + (dedicated to the Design System Lazio), are also valuable sources.

The specializations that designers seek for in their profession are strictly tied to the educational offer of Italian universities and public and private institutions. The current offer is very articulated and comprises over 150 schools mainly located in the north and center of the country. Universities, Academia (Accademie di belle Arti e Accademie di belle Arti Legalmente Riconosciute) and ISIA (Istituto Superiore per le Industrie Artistiche) represent the main active majority of the schools that MIUR (Ministry for Education, University and Research) accredits. Though, beside these "official courses" there are many famous private design schools both undergraduate and post graduate. Over 150 design-related schools have been identified, among which 17 Universities, 44 Academies (20 Fine Arts academies and 24 legally accredited Fine Arts academies), 4 ISIA, 60 post high school schools and 29 professional institutes. At a graduate level, 3 Institutes provide a Design Faculty and all provide at least a bachelor in Design within a Faculty of Architecture or Engineering. In the academic year 2007/2008 10 are the 3 years bachelor courses, 11 the specialized degrees and 30 the master courses. The latest trend in the applications to the bachelor courses is increasing, and in the year 2005/2006 2500 have applied and 8500 have attended the 4 courses: Product Design, Interior Design, Visual Design and Fashion Design. The ISIA - Istituto Superiore per le Industrie Artistiche institutes are part of AFAM and are public institutions providing university level courses structured upon the same modality (3+2 years). They are located in 4 cities: Rome, Florence, Faenza, Urbino. The ISIA apply a strict selection process to select the limited amount of students they accept: between 25 and 50 per year depending on the institute. On average, 30 students per year get the I level degree and 15 per year get the II level one in each institute. Besides the university/academic educational system there are a lot of schools and institutes – often private – which provide many and very diversified 1 or 3 year courses, I, II level or non accredited masters, short courses (4-10 weeks, like Summer Sessions), intensive specialized courses (like1 to 3 week workshops or seminars). The first private schools offering design related education and training were founded in the early Seventies. Currently there are about 60 at high school and post high school level, and about 30 professional institutes. The main schools taken into consideration have, for the 2006/2007 year: IED 3500 students, Domus Academy 250, Scuola Politecnica di Design 200, Polimoda 350, Istituto Arte Applicata e Design in Turin 250, Istituto Marangoni 1200, Istituto Quasar Roma 400. Furthermore, the private schools have the highest number of foreigners: on average 60/70% of the students. (Gallico 2007)

On top of offering education, the design schools also carry out research projects in the design field, especially universities and faculties, departments, university consortia, observatories, university and interuniversity centers, spin-offs and start-ups, innovation and knowledge transfer centers, experimental centers, BICs, centers and agencies for local development and thematic and multidisciplinary centers, observatories, public research centers such as CNR and smaller centers. Private schools also invest in research, although on a smaller scale; the main ones are IED with the CRIED research center and Domus Academy with DARC. In the research field, it is

possible to see how design is recognized and has become a research topic for innovation. The sources used for the acknowledgement of the research centers were the RIDITT (Rete Italiana per la diffusione dell'innovazione e del Trasferimento Tecnologico alle imprese) network, where all the national public research centers are equally listed, and sources like the web sites of the main companies with internal research centers, of the schools' and associations' research centers. In total, 350 design research centers were listed.

To have a complete overview of the system of actors involved in the design world, it is important to analyze the cultural system and system of fairs and publishers. Fairs represent more and more, in Italy and abroad, events which attract the public's attention. Design has a strong link with the fairs as many of the market sectors, which take part into these events, use design as a distinguishing factor in their productions. The main source to list the national fairs, in which design is present in its multiple expressions, is the Guida Mondiale delle Fiere in its updated 2007 edition. Of all the fairs on the manual, those more related to design were selected (about 300): 90 fairs in the Living category [furniture, building], 62 in the Fashion category [clothing, fashion, accessories, jewellery], 40 in the Food and beverages category [food – local development] 30 in the Mechanics – Electronics category [production – innovation], 42 in the Tertiary and Services sector [hospitality – tourism], 34 in the Arts and Crafts category. Almost 40% of the fairs take place in Lombardy and 15% in Emilia Romagna, then in a lower percentage, Tuscany, Piedmont and Veneto. The organizations promoting the fairs are about 160.

The design cultural system includes about 200 among museums (40), archives and companies' museums (110), temporary locations (50) offering design exhibitions, performances and installations. The sources used to collect the data are dedicated websites such as ICOM (International Council of Museums), museionline.com, etc…under the design listing. Other sources were: the indication by associations belonging to the design directory; the presence, in the corporate name of the institution, of key words such as design, art, arts and crafts; the publication on accredited guides (Touring, Guida Index Interni); the museum and business archive website (*www.museimpresa.com*), the thematic website linked to the fairs such as fuorisalone.it and the lists of Italian regions and provinces published by the websites.

The design editorial system comprises magazines and related publishers committed to publish and communicate design related texts and images. This industry currently represents big worldwide famous publishers as well as small and medium publishers which work in specific market niches. The design publications include a large number of periodicals, magazines, dossiers, on line publications regarding design issues: internationally renown magazine, as well as specialized publications widely spread among economic and market operators, specialized publications, books and manuals about design and the design culture, publications related to design schools. Around 200 magazines and 60 publishers were listed. The majority of the publishers are located in Lombardy. As a direct source, which guarantees the scientific validity of the publications, the presence of ISSN code was taken into consideration. Indirect sources were used since there is a large publication of design related contents in more general types of magazines. The parameters allowed to consider all the publications (periodicals, dossiers, free press) which contributed to the communication of the design culture: the publication on the AIE (Associazione Italiana Editori) list; the acknowledged tradition related to design related disciplines; company house-organ; main websites, webzines and on line magazines with newsletters.

4. Building a system: methods and examples

The capability of building relations, "orchestrate" situation and "building systems" is a peculiarity of the Italian context, where for "system" it is meant an entity comprising of a plurality of elements. As regards Italian design though, the term can be used in its more correct meaning, thus system indicates "the whole of elements and the relations established among them". The

relations are those which determine the “form of the system” and finally make him recognizable as whole entity. (Manzini 2002)

In fact the *design system* comprises a series of actors with different skills, resources and specific competencies, but it also includes media, meaning communication channels dedicated to institutional promotion spaces, small research and technological testing labs. All professional associations, schools, courses and cultural events are part of the system. It includes all the activities that support design: from model to prototype makers, to mould producers to web masters, to graphic designers. The perception of the system is pretty immediate, while it is more complicated to focus on how the system functions, what elements “keep it together”, what allows it to be recognized as one entity, despite its internal and complex articulations. As regards this topic, the research allowed us to see the profound nature of the articulated totally of systems comprising the Italian design system; the way in which it self-defines as a favorable habitat for the plurality of systems it includes; its strength and potential weakness when changes are happening inside and outside the system. All this shows that the Italian design system is to be considered as an “evolved ecosystem”, as such quite resistant to the adversities of the environment. (Manzini 2002) In Italy to “design” currently means to act at a system level. Although Italy is internationally considered as the *design capital*, it doesn’t institutionally have any political or information support for the design field, thus there is no acknowledgement of the implicit or explicit design system. (Maffei et al. 2004)

The Italian design system has many strengths such as the solidity of structure’s base, but also many weaknesses: the system is hardly mapped, non shared and thus uninformed. The actors involved never had a guidance, a definite form, a codified structure.

The international experiences are of different natures, public or private or both, and their approach is to privilege actors relations of different scale. However, the shared aim is to combine an institutional policy with a tendency to share data in order to establish relations.

A first example is represented by the Design Directory Wales (Dylunio Cymru, Design Wales), managed by a public institution, Design Wales, and funded by the Welsh Assembly Government. The Design Directory Wales is periodically revised in order to guarantee the information update. One of its main objectives is to guarantee an independent consultancy service regarding specific design oriented topics. The main target is the Welsh industry, based on a creative and diversified industrial design. This kind of Directory allows to freely access the information on design competencies in the area.

In the United Kingdom there is another example of public institution, the Design Council, which uses applied research as a tool to publish annual reports on the actors of the English design system. (The business of design - Design industry research 2005) The English case, although without using a real directory, represents for its structure and experience one of the first institutions that answered the need to direct and manage such a complex system as that comprising the actors involved in a design project. (Arquilla 2004)

There are also private examples raised by the needs emerged in professional fields. One of these is the CORE77 directory, created with the collaboration of the magazine Business Week (DESIGNDIRECTORY).It is a detailed database published on the magazine homepage where other contents regarding the discussion on the strategic value of design in business opportunities are published. With about four million users, the directory has a large potential of being seen by a global and differentiated public. This directory, created in 1995, is used by international designers, both students and well-known designers. Furthermore, CORE77 publishes articles, forums, a calendar of events, conferences, parties and exhibitions. Coroflot is an appendix, the characteristic of which is to concentrate on portfolios and job postings.

Design Boom and Italiandesign360 are also private but represent a different typology in the representation of the design system. They use the interview and communication modalities close to journalism as tools to present thematic lists, privileging contents related to individual initiatives. Italiadesign360 was created in 2006 and has a very wide public of actors. Their access

and that of the companies is filtered by the site management and divided in categories and design disciplines, as it is dedicated to the Italian contexts.

Once the two possibilities are highlighted, the institutional and the private one, the Design Directory hereby presented represents a third possibility, original and experimental, which combines the models in one tool. The Directory is the result of a research project carried out by the Dipartimento Indaco of Politecnico di Milano and Triennale di Milano. The main characteristic of this tool is represented by the input that activates the system, where the single user, once registered, is the protagonist of a series of activities not only comprising the self-communication and promotion, but also the dynamic definition of a method to interact with the elements involved in the project. The process, once activated by the University as a public institution, is then extended to the other actors.

5. Shared platform: how to represent and recognize the system

To acknowledge design its value means to implicitly acknowledge the system around it. For this reason, the design system needs to be constantly monitored and analyzed, so that it is possible to see its endogenous and exogenous changes, and the elements which bring vitality versus those that lead to impoverishment. The centrality of the system involves the designers, the associations, the publishers, the education and cultural promotion, the fairs and exhibitions. At Politecnico di Milano an intervention idea was tested: to acknowledge the system and its evolution through a representation model, a platform shared among the actors of the system. It isn't a design center or a window for Italian design as there are in other Countries. The idea was to suggest from the bottom, sharing the concept, a self-representation method which involved since the very beginning (in the ideation and creation) all the actors of the system, trying to gather them together and giving them a shared identity, and most of all enabling the relation among them.

The strength of the system lies in this network of relations on the territory among the different actors involved: their competencies and skills are complementary for the development of design projects. The shared platform is called Design Directory, a "mechanism" that from a simple service design tool aims to become an intervention, a cultural action aimed to make the system explicit, a process of creation of a value that the actors share. The Design Directory becomes an action to found and represent the system, a list of the involved professions which is well represented by this claim: "count yourself to matter". The platform was defined through several steps. The first was at a local level: the Design Directory Lombardy was created for this, and presented at the "MilanoMadeInDesign" exhibition (organized by Design Focus – Observatory for design and promoted by Provincia di Milano and the Chamber of Commerce of Milano, in collaboration with Regione Lombardia). It represents the first step toward the creation of a wide information and service system aimed to enable the dialogue and the mutually advantageous exchange. The platform has two main values: from one side it gathers and visualizes the lists of all the professionals listed in Lombardy in the design systems, and from the other it visualizes the clustered data, emerged throughout the research, through maps and schemes which simplify concepts and current phenomena in the design system.

The second step, still in process, is that of creating a platform shared at a national level, Design Directory [Italy], which follows the dynamic of the regional one, but represents a tool to share and represent the design system, which could be used and updated by all the actors involved. The web was chosen to build and collect these data as it is currently a valid tool to share this kind of information, and it was the main tool from which the communication actions were activated. The online tool allows to get over the cultural boundaries and makes the system accessible to everyone.

The Design Directory is a “mechanism” that besides being a simple design tool, aims to become a winning cultural action using the “web 2.0” approach (Grivet Foiaia 2007) to stimulate the creation of social network, the participation of all the actors and the co-creation of contents (O'Reilly 2006). This new working method should make explicit the process of value creation, which participants can eventually share. Thus, Design Directory becomes a founding action to represent the system, a list of the involved professionals, well represented by the motto “count yourself to matter”. The Design Directory represents an example of mass collaboration, where new communication technologies are democratizing the creation of value. (Tapscott and Williams 2007).

This model wants to have a twofold aim: to aggregate actors in order to make them recognizable and communicating with each other on one side, and become a replicable example in different situations and territories both locally and globally from the other.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Fish Box in EPS

Zero Impact

C. Anna Catania[1]

Abstract

The object of the study is to demonstrate that an enterprise can be efficient also when it concerns the protection of the environment and that this is the key in order to obtain a sustainable development.

In order to obtain this, a company is held to reduce the impact of the products during the entire life cycle of the product (from production to disposal) and to use adequate strategies that aim to reduce the impacts on the environment.

The analysis will regard the field of packaging, considering a Sicilian company, that produces packaging made by Expanded Polystyrene (EPS) and in particular boxes for fish.

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1. Introduction

Nowadays design has the limitations that the environment imposes on the current system of production and consumption. We live in a world of products with a minimal environmental attention: a world of disposable items. Producing minimal levels of quality and an enormous mass of waste will lead to an environmental disaster.

The urgency and relevance of the problems connected with the environment has lead to a new set of solution, based on new different research lines.

Different research lines for a production system and a consumption model respectful of the environment is an approach to the environmental management of products.

Indeed, today, the phase of the ecodesign assume a strategic role in the product process development and in the process of innovation of the enterprises.

The aim of this project is the development of a production system and consumption model environmental friendly and a novel approach to the environmental management of products.

Therefore, to ensure today that a product matches the environmental criteria waste management with product design, it should be removed from the waste stream, reprocessed, and reused.

Indeed, today an important objective is the protection of the environment, a new approach, that is fundamental for the processes production and the competitiveness of the enterprises.

In fact, the goal of this paper is to demonstrate that an enterprise can be efficient also when the production becomes concerned in the protection of the environment and that this is the key in order to obtain a sustainable development.

In order to obtain this, a company is held to reduce the impact of the products during the entire life cycle of the product (from production to disposal) and to use adequate strategies that aim in reducing the impacts on the environment.

2. The research methodology

The analysis will consider the field of packaging, considering a Sicilian company, that produces packaging made by Expanded Polystyrene (EPS) and in particular boxes for fish. The company sells the boxes in the entire Sicily and also to foreign countries.

The boxes in EPS destined to the transport and conservation of fish are safe from the hygienic point of view because mould does not develop.

In practice, the paper will be organized in two phases:

- In the first phase, the production and properties of Expanded Polystyrene boxes will be improved, designing boxes that will be put one on each other, stackable and with a lower weight. This will imply a better stacking, about forty percent in more than with normal boxes with a consequent saving of energy, resources and therefore a reduction of the environmental impact. In this phase the packaging will follow the parameters of ecodesign: redefining of packaging in weight, reuse of the product also for other functions, recycling of the material to introduce in the production cycles as second materials, and energy recovery.

- Then, the aim will be the recovery of the boxes to be reutilizes in a new production process in order obtaining zero impact. This phase will begin with the description of data related to the amount of the wastes and of the models of collection and reuse of disposal boxes.

After this study the recovery to the logistics and the reuse of the boxes will follow .

The new methodology will be based on the total recovery of the boxes in the Sicilian territory and the indications for a subsequent reuse.

It is a design methodology that does not consider the production process in terms of resources and wastes, but consider output as inputs of another processes

Therefore, an optimal use of the waste, through the employment of new technologies, will bring returns and benefits to the territory thanks to the zero impact.

3. Design and environment

Today, design is important for producing items with reduced environmental impact. Indeed, in the product process development and in the process of innovation of the enterprises the phase of the ecodesign assumes a strategic role . Environment requirements of a product defined at the design phase cause positive effects in the environment during the other phases of product development.

The aim of ecodesign is to minimize the environmental impact from products and processes with these strategies:

- selection of low impact mterials
- maximise energy and water efficiencies
- design for waste minimization
- choose cleaner production processes
- making products recyclable
- design for waste minimization

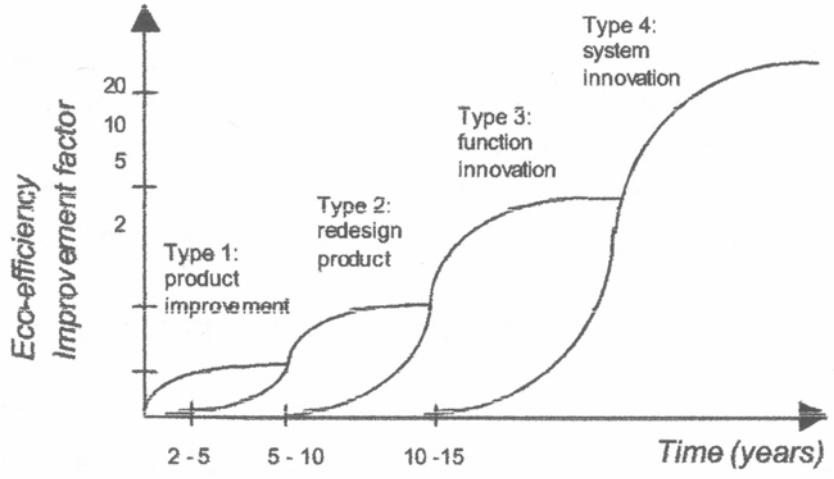

Fig. 1: Four steps model of ecodesign innovation

Environmental research in industry started in the 1960 and led to the ecodesign activities of the 1990, which refers in product development aimed at minimising a product's environmental impact during its entire product life phase.

Ecodesign model can be visualized using the four-step model as is illustred in fig.1

The four step model as described by Brezet (1997), Charter & Chick (1997), Stevels (1999), and Meinders & Meuffels (2001), from incremental improvements of products to new products that have a functionality wich completely fit into a sustainable society

These steps are further described in the following:

step 1, product improvement :The improvement of existing products consist s of decreasing the use of materials or with regards to pollution prevention and environmental care;

step2, product redesign: redesign a new product on the basis of an existing product; the aim is increased reuse of spare parts and raw materials, or minimising the energy use at several stages in the product life cycle ;

step 3, function innovation: changing the way the function is fulfilled. Example private cars to 'call-a-car' systems.

step 4, system innovation: new products and services arise requiring changes in the related infrastructure and organisations.

Ecodesign in step 3 e step 4 involve more companies in multifunctional systems to succeed. These steps will need new ways to: produce and distribute energy,communication, manage waste materials.

Furthermore in these steps work will need new values and attitudes, both in the companies, among consumers and in the society as a whole and the perspective of these steps solutions will be 10-50 years; while the perspective of step 1 and 2 solutions might be 1-5 years.

In recent years, environmental research has concerned with moving towards sustainability.

As Stevels states, "Applied EcoDesign has developed strongly in the last ten years and is now solidly on the business map. It has changed from a subject with a limited scope and an inward green-looking approach to a wide field, inspiring engineering, business, consumers, and society as a whole" (Stevels, 2001)

Thus in this work I will use ecodesign strategies to find solution more environment friendly. The parameters of ecodesign will describe:

- redefining of packaging in weight ;
- recycling of the material to introduce in the production cycles as second materials.

Finally the recovery and the reuse of the boxes will follow and so wastes of a process can become the resources of another one.

4. Expanded Polystyrene (EPS) and properties of EPS packaging

Expanded Polystyrene (EPS) is made from non renewable petroleum based chemicals.

EPS products are 98% air and only 2% PS It is made from expandable polystyrene that contains a small amount of pentane gas.

The gas expands under the action of heat, applied as steam. Thus EPS consist of a foam structure of closed cells containing air. These products are ultra lightweight, with excellent thermal insulation and shock absorbing properties. They do not contain any CFC or HCFC.

The insulating properties of EPS can be used to ensure that a product is kept at an temperature low. Thus it is the ideal material to use for any packaging where thermal insulation is important. Expanded Polystyrene can also help to protect against sudden temperature changes.

Expanded Polysryrene is light, hygienic and used for packaging food, medical supplies, electrical goods and insulation panels and it is also used to protect products used for distribution, storage and delivery.

Properties of Expanded Polystyrene (EPS) packaging are:

protection

The shock absorbency of expande polystyrene and compression resistance of expanded polystyrene packaging provides excellent protection properties.

durability

The durability of Expanded Polystyrene makes it a protective packaging for a wide range of goods. The material is moisture resistant, so hygiene requirements are met. EPS is also odourless and non-toxic.

lightness

EPS is made up of 98% air, making it a lightweight material. This means that fuel consumption emissions are lower than with heavier materials and ransport costs and fuel emissions are kept to a minimum

versatility

EPS can be moulded into any shape to protect the smallest electrical component or the largest fridge-freezer

termal Insulation

The thermal insulation properties of EPS is used to box fresh fish and for seed trays where it assists in the growth of the plants. It is also used in packages items that are temperature sensitive and that need to be transported

recyclability

Expanded polystyrene recycled is used used to make new EPS insulation or packaging, or items such as replacement hardwood furniture, CD and video cases.

5. Recovery and recycling of Expanded Polystyrene (EPS) Packaging

The production of packaging material is the largest segment of the plastics processing industry . Food industry constitutes the major slice followed by beverage industries and cosmetics.

Expanded Polystyrene for packaging is a way of protecting the goods, its light weight reduces shipping costs and its water resistance and insulating properties protects perishables products during transportation.

The insulating performance of Expanded Polystyrene is very high compared to conventional packaging materials.

In fact Expanded Polystyrene is the ideal material to use for any packaging where thermal insulation is important.

The insulating properties of Expanded Polystyrene can be used to ensure that a product is kept at a temperature and it can also help to protect against sudden temperature changes.

Hence Expanded Polystyrene is ideal material for fish box and seafood industry , but the disposal of used polystyrene fish boxes can be expensive and a difficult problem thus is very important an alternative to throwing boxes in the bin.

Actually there are two options for the disposal or recycling of used Expanded Polystyrene as energy recovery and recycling.

Energy recovery for Expanded Polystyrene (EPS) fish boxes or horticultural trays , generates value from used contaminated packaging material .

So the energy available from petroleum that is used to produce them then 'return' it when it is used as a fuel in the waste-to-energy conversion.

Moreover the calorific value of Expanded Polystyrene available for heat recovery is higher than that of oil and so Expanded Polistyrene provides a valuable source.

To recycling used Expanded Polystirene packaging, it must be segregated from other materials. So the collected material is compacted for easy, cost-effective transportation. Then recycler will send a lorry to collect the material.

In a second phase the Expanded Polystyrene will be granulated in smaller pieces. Then the material is passed into a blender for thorough mixing with similar granules.

At the end the material is fed into the extruder, the extruded material is then moulded into a new material such as hardwood replacement for making garden furniture, slate replacement for roofing tiles and new plastics items such as coat hangers, CD and video cases.

The landfill of Expanded Polystyrene packaging represents a missed opportunity to recover valuable resources. However, EPS is an ideal material for landfill because it remains inert, is non -toxic, odour-free.

Furthermore in 2005 borned an agreement between Aipe (Associazione Italiana Polistirolo Espanso) and Corepla (Consorzio Recupero Plastiche) with the intent of regularising and facilitating the procedures of conferment and recycling of polystyrene foams packaging waste.

Aipe (Associazione Italiana Polistirolo Espanso) and Corepla (Consorzio Recupero Plastiche) have signed an agreement to create a national structure to increase the system of collection and recycling of EPS packaging waste.

The agreement has born to favour Expanded Polysyrene recycling by a separate handling of waste packaging. The system, intends to favour the recycling of expanded polystyrene thanks to the creation of special EPS collection platforms (PEPS) spread throughout Italy.

The management of the platforms will be entrusted to a collection of companies . These companies will see to the recovery and the reinsertion of waste packaging into the production process.

6. New prospects for fish box in Expanded Polystyrene

This work shows the development of ideas for sustainable products through the utilization of the packaging. The packaging is an essential part of the industrial and commercial supply chain, it protects goods, allows efficient transport and the distribution.

The analysis will provide information needed to better understand the current environmental profiles of the product and in particulary implementation of ecodesign.

Ecodesign, which refers to actions taken in product development aimed at minimising a product's environmental impact during its whole life cycle,is as a means to preserve, besides the environment, the competitiveness and the image of the company.

As we said Expanded Polystyrene has many characteristics: it is a lightweight cellular plastic material. It is this closed cellular construction that gives EPS its remarkable characteristics.

Expanded Polystyrene offers the following benefits when used as a packaging material: shock absorption and protection against humidity, low density, thus lightweight packaging, low thermal conductivity protects contents against sudden temperature changes chemically inert and therefore can be safely used for food packaging.

In fact packaging sector continues to absorb considerable quantities of Expanded Polystyrene (24% of the demand of polystyrene foam in the packaging field) in the form of slabs, corner pieces,for the protection of goods during transportation.

Among the main segments boxes (29%), componentry (19%) and seed boxes (14%), followed by the furniture and food segments (9% and 5%).

A main shortcoming of the Expanded Polystyrene packages is that are too and they deemed a collection and recycling phase.

In fact, the environmental impact appears as one of the most important problems for the entire sector.

The companies have the need of a program for stimulating the environmental sustainability of Expanded Polystyrene , accompanied by appropriate phases of recovery and recycling.

To do this we analyzed a Sicilian company that produces packaging made by Expanded Polystyrene (EPS)

The analysis is started from the presente state, considering:

- analysis fish box
- analysis of the organization and disposal of fish box

The analysis has investigated on technical requirements and legislation for the suitability of Expanded Polystyrene uses for food.

From the investigation the Expanded Polystyrene fulfill the requirements of legislation the regulations about fish transportation and to food safety as reported down.

Packaging materials and products that are in contact with fishery products must comply with all the rules of hygiene, and in particular: they must not be such as to impair the organoleptic characteristics of the fishery product and they must not be capable of transmitting to the fishery products substances harmful to human health.

Containers used for the dispatch or storage of fresh fishery products must be designed in such a way as to ensure both their protection from contamination and their preservation in hygienic conditions and,they must provide adequate drainage of melt water.

Expanded Polystyrene packaging,with its outstanding thermal and protective properties, offers a reliable and cost effective packaging option for fish producers.

In addition, the fish box must be produced in compliance with the UNI regulations:

UNI 79 70/05 ensures that packages are needed to transport food;

UNI 70 35/00 confirms that packages are made with plastics for contact with food;

UNI 64 26/00 ensures that are pallettizzate cassettes for the transport of fish;

UNI 64 27/00 material was subjected to the tests planned for the plastic boxes for the transport of fish.

The production of the Expanded Polystyrene boxes have been improved designing boxes that are put one on each other , stackable and with a lower weigth than normal boxes used by company.

This will imply a better stacking, about forty percent in more than with normal boxes with a consequent saving of energy, resources and therefore a reduction of the environmental impact

In the analysis of the organization and disposal of fish box, the aim has been the recovery of the boxes to be reutilizes in a new production process.

The analysis shows that there is not recovery of post consumer polystyrene for recycling and therefore it is important to implement a 'Waste Strategy' which aims to explore new methods of waste management; looking at the ways in which we can achieve our environmental responsibilities.

In this way waste management programmes can be tailored to local circumstances, such as the infrastructures for collecting waste and demand for recycled products.

Recycling techniques must be chosen to maximise the value of the goods produced, whilst minimising the consumption of resources for transporting, sorting and cleaning the waste.

Part of waste strategy can to help develop new markets for recycled materials, in fact Expanded Polystyrene can be granulated and mixed in with virgin material to make new products and used to manufacture a container for colture hydroponic.

The mixture will be composed with 50% recycled Expanded Polystyrene and 50% virgin material.

The model of collection promote the recycling of Expanded Polystyrene box waste, from municipal segregated collection. The recovery will be organizing the systems of conferment so that the material can go from storage, from wholesaler and from point of sale to the recycler without intermediate phases.

The waste Expanded Polystyrene boxes will come back to company in a truck. In the company, they will be granulated to make new products or can also be mixed in with concrete.

These new materials make from recycling of Expanded Polystyrene box waste can be used in Sicily by company manufactured cement and concrete products and company manufactured hydroponic systems product .

6. Conclusion

Implement waste strategy can help develop new markets for recycled materials, and material to dispose, and it can guarantee the survive of another company, that can use it as raw material.

Therefore, the main objective of the new methodology is to employ the wastes in a new production thus to obtain an added value, an approach on the System Design: wastes (output) of a process can become the resources (input) of another one.

This new organization will be able to lead to: activate new production fields; new resources and new actors; to produce with zero impact.

These will become the starting points for the creation of an integrated system of local production that will bring returns and benefit to the territory .

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

New Outputs policies and New connections

Reducing waste and adding value to outputs

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Abstract

To solve the waste problem we could configure new networks among different companies in geographic proximity. This allows to establish relations that lead to zero emission by implementing a sustainable management of wastes.

If we have a design methodology that values the quality of the outputs, we need to make these potentialities concrete by providing a system with available resources and their possible users.

It deals with the design and establishment of a Database that can be consulted: this acquires and organizes the information about the outputs produced and the inputs required as resources, the manufacturers present in the community. The goal is to organize data into a system in order to create connections between outputs produced and inputs required.

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1. Introduction

Industrial development has always been based on the intensive exploitation of natural resources; this violent aggression against nature has jeopardized precious resources that often are unrecoverable.

Water, air, soil, from which most of the indispensable resources for human survival derive, until not too long ago seemed to have no value and were exploited in the conviction and presumption that they would never be depleted. Now we must acknowledge the scarcity of these resources and plan ways to manage them more rationally.

In a similar context in the past few years two questions of social, economic and environmental significance have become ever more problematic: on the one hand we are witnessing the continuous rise in the price of raw materials and a strong demand on international markets for recyclable materials, while on the other hand we are producing more waste.

Though in daily life we make an effort to eliminate solid urban waste by differentiated collection, we are paying less attention to industrial waste. The latter is perceived as being far from our personal sphere, though the mass media reminds us of the growing importance of its impact and the proportions of the phenomena. And this does affect our daily life.

We could go so far as to consider waste an indicator of lifestyles or consumption habits of the society in which we live. It tells us what we consume, how much we consume, the way in which we consume it. This statement derives from a careful observation of the power of persuasion we are all subjected to everyday, through various media that exalt the equation according to which greater consumption favors a rise in one's well-being and social prestige.

Our attention to the real value of goods is clearly limited. We ignore its value when it is being used and after using it, even briefly, and we ignore its value after it is discarded.

We must wake up to the fact that the growing mass of waste generated by industrial activities is becoming increasing critical as much as it causes serious damage to human health and the environment.

Humans have recognized the problem too late and have tried to solve it downstream of the process of using the product. These actions that later proved to be inefficient.

This occurred because we have always thought of production processes as a sequence of actions, independent from one another, implemented to produce a commodity. Along with said commodity a huge amount of waste is produced. Said waste is considered an obvious result, along with the finished product, of the manufacturing process. And as such it is accepted.

In the current-day manufacturing model, the focus is exclusively on the product, though there is sometimes a targeted attempt to minimize the negative impacts of byproducts.

We must change this behavior. In a world that is ever more complex, like the world we inhabit today and will inhabit in the future, we must extend our gaze to the entire production process and see it in its entirety, i.e. not by single phases. We must deal with everything produced, products and waste, to start implementing targeted actions to achieve a substantial harmonization of the relationship between the environment and local communities.

This is one of the principles underlying systemic design: to think by connections allows us to see each anthropic process in a new light, and by viewing the entire system we can pursue the goal of zero emissions.

Production must be seen as a support to society and not as an end in itself. Therefore we need to seek out new ways of producing that guarantee remarkable results in social, ethical and environmental terms and lead to an improvement in the quality of life.

2. Aims

The purpose of this study, carried out by Disegno Industriale (Politecnico di Torino) in collaboration with ZERI (Zero Emission Research & Initiatives), Neosidea Group, Corep and eHORIZON s.p.a., is to propose an instrument for study and analysis based on the concept of an open system that would allow the configuration and realization of a new network of connections among different companies in geographic proximity. This would allow the establishment of relations for the purpose of achieving zero emission by implementing a sustainable management of the waste products of said companies. This would also earn them revenue from the sale of their outputs.

The goal is to build a network of know-how which, through true market mechanisms, would stimulate a reduction in all forms of waste and would help upgrade the remaining outputs by giving them a new economic and legislative value.

The new relations created between local companies in the community would minimize the use of external resources and provide more clarity in tracking the chains involved. This would help create strategies for potential additional instruments for territorial development.

This methodological principle totally changes the perspective for observing things: according to the first principle of systemic design the discards (OUTPUTS) of a process are used as resources (INPUT) for another manufacturing process.

The outputs are enriched with new value and become a resource available to be in the manufacture of new products closely associated with the local skills.

Therefore it becomes possible to create new manufacturing scenarios where the output of one company, a useless material to be eliminated incurring expenses only, can be reused to ensure the survival of another company related to the business category or physical location of the first company. The latter sees this output as a raw material to transform and add value to.

In order to avoid squandering and creating residues, even industrial activity must reflect on how way the Perfect System works: Nature. In Nature there is no such thing as waste because the substances eliminated by one species are used by other species for nourishment and even surpluses are metabolized by the System.

Nihil igitur fieri de nihilo posse. These are the words of Lucretius in “De Rerum Natura”, and express with artistic finesse the concept that nothing can be produced from nothing. Lucretius was ahead of his time because only several centuries later did humanity start understanding the concept summarized in the phrase “Nothing is created, nothing is destroyed”.

The balance that regulates systems and natural cycles has always respected this rule and has continuously “recycled” the outputs of natural processes to obtain a producing material from it. If Nature does not understand the concept of waste but only the concept of material transforming itself, humans can do the same with their processes of use and transformation of natural resources.

In this way the material continuously circulates and diversity ensures the capacity for recovery. In manufacturing this allows us to design open autopoietic systems that can sustain themselves.

New flows of material, which start as outputs, are valued as resources and create relationships for the first time between different companies that come together to reach a condition of reciprocal advantage by reusing the outputs of their production processes.

It comes natural to specify that we are facing not only an environmental issue but the unfolding of a new business model. Currently we are forced to spend huge amounts of money to treat and dispose of waste. The new methodology proposes that we add value to the discarded materials so we can eliminate waste disposal costs and create a network for marketing the outputs. This generates greater profits and creates jobs and wealth in the community by

spawning new entrepreneurial initiatives, developing businesses and improving the already existing businesses.

This process can be applied to any production sector. It is deliberately being proposed locally not only to appreciate local potentialities and specificities and reinforce the connection with tradition, but also to avoid transportation costs and the air pollution created by it.

By following these concepts of systemic design, the world of manufacturing, which today is truly lacking an environmentally mature culture, would succeed in achieving the goal of zero emissions.

3. Area of research

This study will focus not only on products but on production cycles with the intention to create a system that resembles Nature, where there is no concept of waste and even surpluses are metabolized by the system. Therefore the outputs of one production process can become the raw materials for other processes.

Enriched with new values the outputs become a resource and available to be used to produce goods and services, thereby favoring the birth of new local manufacturing activities.

In this sense all in industrial production must reduce the use of nonrenewable materials and evolve toward less energivorous processes, making uncontaminated outputs that can be reused for their qualities.

The availability of many new resources stimulates research to find new fields of application suited to the territory being examined.

In the case at hand the study area is Piedmont Region, and specifically each of its provinces where the major activities are associated with the sector of metalworking and textiles as well as agriculture and animal husbandry.

In this study area it was essential to determine which activities can be connected in an open production system with the goal of completely re-utilizing the outputs and achieve a zero emissions production system.

Along with this identification process, we also carefully analyzed the data on the MUD (Environmental Declaration Form) which reports the waste produced by economic activities, along with the waste collected by the municipalities and the waste treated and eliminated, sent to be recycled or transported during the year previous to the declaration. On this form the waste is divided according to industrial output, activity and category of waste, and the waste management activities conducted for each:

- waste management activities grouped by region;
- detailed data regarding the recycling activities of the aggregated waste by category;
- detailed data regarding waste treatment activities grouped by waste category.

The study of this information in relation to the activities for managing the waste produced by the major sectors on the Piedmontese territory shows that currently there is a large quantity (tens of thousands of tons per year) of material with abundant potentialities brought to the dump or destined to biological or chemical-physical treatments. Said treatments produce compounds or mixtures that are eliminated by scattering them on the soil or storing them in permanent storage locations. This not only prevents the possibility of exploiting the intrinsic richness of these materials more effectively but also squanders resources that can be used in other areas. Last but not least, this approach is potentially dangerous to the environment.

All of this is further demonstrated by the comparative data between the types of waste and the operations they undergo currently to recuperate material. The result is a huge amount of material, today seen as waste and not as a resource, used mainly as fuel or scattered on the soil

to benefit agriculture or the environment. However, this method fails to take into account that if the waste is contaminated it will contaminate the soil on which it is scattered.

Subsequently research is focusing on the study of the current use of manufacturing waste and in particular the different types of waste to identify which ones are already being recovered and which are being sent to the dump. This is being done to determine and categorize the different types of waste to be studied.

To prefigure the use of outputs as resources in a new process, the quantity and quality of the waste produced currently on the regional territory of Piedmont are carefully examined. Then they are categorized according to their chemical-physical and biological properties and their potential applications. This allows us to discover the optimal application of the ways, even through the use of available or innovative technologies, to bring revenue and benefits to the local economy.

As soon as we have a design methodology that realizes the potentialities associated with the quality of the outputs, we need to make these potentialities concrete by providing the system with the available resources and their possible users.

The results show the differences between the current production process having a linear structure and the new process that proposes an open industrial system based on a sequence: output quality> output reutilization> resources> profits. Moreover it indicates the significant advantages of the latter system.

Specifically we are dealing with the design and establishment of a Database that leads to the management of a databank that can be consulted. Initially the information about the outputs produced and the inputs required as resources is acquired and organized in terms of quantity, type, quality and geographical location on the territory. We also gather data regarding the manufacturers already present in the community. In the second phase we enter the processed data into a system for the purpose of creating new connections and relations between the outputs produced by certain companies and the inputs required by a production process.

In order to ensure maximum accessibility by all the entities involved, thereby favoring the creation of new relations, the system was designed and developed with Web 2.0 technologies and made available on an ad hoc web portal; graphic images about the type of local activities and type of waste products are elaborated and created in order to make easier the comprehension of the entire research.

The purpose is to create a new network of skills, know-how and relations amongst the various companies located on a given territory who can contact each other and establish a condition of reciprocal advantage by re-utilizing outputs.

All of this enables new resources to circulate continuously thanks to the creation of new local flows of material, generating positivity and profitability.

This research sets out to promote optimal forms of exploitation of the outputs which, after adding new values them, become available resources already present on the territory to other active local businesses.

Cleary this issue is not solely environmental but also affects economy. In fact enabling companies already active on the territory to reuse outputs, the relationship between local companies is reinforced, their earnings are increased and important new effects are engendered on the territory. This approach will weaken the current system of supplying resources that require procurement from sources outside the local territory and sometimes even from abroad.

It favors local development and provides new opportunities for feasible encounter, exchange and collaboration. This in turn establishes a direct and local relationship between the producers of outputs and the users of these outputs as inputs, i.e. as a resource in their own process.

To do this it is necessary to build short production chains that go beyond the common concept of “short chain”. These are better known as “direct sales”, which allow consumers to purchase foods directly from the producers, especially farm produce and meat products.

With the creation of a Database we are proposing that short chains be set up in the production sphere that allows operators to contact local companies to procure resources or set up operations to reuse outputs for the purpose of reinforcing the bond with the local territory.

According to this logic, the radius of action for the exchange of materials will not be greater than 45-50 km. This will reduce the time needed for procurement and the impacts of long-distance transportation.

The advantages of such an approach are both environmental and economic. Among them the most significant is the reduction of waste disposal costs and the consequent increase in profits a company earns from selling its own outputs. This also reduces environmental costs, i.e. energy consumption, pollution and traffic caused by the transportation of materials because it uses materials already existing locally and avoids exploiting virgin raw materials.

Nothing is lost because the reciprocal output>input process becomes evident and multiplies the business opportunities of the system which becomes ramified, dynamic and multi-polar. It values peculiarities, cultures and know-how and local resources minimize dependency on outside resources.

The Database would have three functions:

- producers of waste would be able to determine which local companies could use their outputs as resources in their production process;
- the Database could tell them which companies produce outputs that they can use as resources;
- the Database could also be an effective instrument for evaluating the entire production process and become an instrument for providing feedback.

This process can provide useful and effective information regarding the company's current production process. If you enter the type of waste produced by your company as a search criterion, and the Database gives no results for possible reutilization of your outputs, this means your current production process makes waste that cannot be reused or recycled. It means your company produces items by using inputs and processes that do not comply with the vision of an open system.

This sheds light on the need to make certain changes within the production chain and to reconsider the current inputs in favor of other ones that are more environmentally sustainable.

As regards the operative functions of the Database, in this document we would like to present two case studies. The first involves the identification of an output-input process in the cattle raising business; the second one involves a feedback process concerning the production of ball bearings. In both cases we show the differences and advantages (regarding the outputs and inputs, the reuse of the outputs, the new resources made available, the costs and profits) between the current process and the systemic process proposed. What is more important, we show the close relationship between the overhaul of flows entering and the possible construction of new relations aimed at the substantial limitation of harmful or unusable outputs.

We deliberately chose two sectors that are entirely different but which demonstrate that this method can be implemented in fields of application that are diametrically opposed: rural farming and the metalworking industry.

The first case study looks at the activities defined by the Ateco 2007 codes (classification of economic activities) in category A which includes agriculture, forestry and fishing. These are the most advantageous businesses for applying the systemic approach because these businesses annually produce approximately 68.000 tons of nonrecyclable waste on the Piedmontese territory alone.

In the preliminary phase, after establishing the business category of reference, we carefully analyzed the regional territory to create a detailed map of the entire Piedmontese area. Later we later concentrated specifically on each single province and municipality.

This allowed us to locate all the businesses present on a provincial and municipal scale and subdivide the territory into micro areas characterized by the type of production and type of waste products. Using this map we proposed the sustainable management of outputs by creating new networks of expertise in relationships among local companies.

Cattle: current situation

Taking into consideration a territorial setting with a radius of approximately 45-50 km including some municipalities of the Piedmontese provinces of Asti and Cuneo, we focused on the agribusiness sector of cattle raising, which uses intensive breeding. We analyzed the current phases of the chain, the incoming resources, the amounts and qualities of the waste products and final products.

Intensive breeding (factory farming) refers to a form of husbandry that uses industrial and scientific techniques to achieve the maximum quantity of product at the minimum cost by using minimum space for each single head of livestock. The study conducted on the various phases of the process, showed critical points in all the phases.

In the current situation the waste produced by this process is not reused and incurs disposal costs. In particular the water dirtied by milk is sent to a disposal plant which does not exploit its protein properties.

The same happens to the blood produced by the slaughtering phase, a substance that contains meat residues now stocked in dumps and not appreciated.

Moreover, though the cow manure is rich in nitrogen, and therefore harmful to the environment, it is spread on the soil as a fertilizer but it creates only negative effects.

Various critical point are therefore present at all levels of the chain and significant quantities of material are now sent to the dump or disposal operations which entail considerable economic loss and damage to the environment.

In conclusion, the final products of the current process are low-quality meat, milk and leather products.

Cattle: systemic vision application

Creating an open system means designing flows of material on the basis of which new companies relate with each other to achieve zero emissions production thanks to the sustainable management of their waste products.

Examining the chain and its complexity allowed us to find new opportunities which till now were unseen:

- the cow manure, as well as the sawdust of the stables, is exploited to produce biogas from which we obtain carbon dioxide, methane and sludge. The latter can be used as natural compost for local agriculture in both the Asti and Cuneo provinces. This brings benefits to a place where today the spread of livestock farming effluent is one of the main causes of soil pollution;
- the water containing milk residue (approximately 310.000 m^3 per year, of which 5% is milk), rich in nutritional properties, is not discarded but used as food for freshwater fish, e.g. tench, raised in companies located near the livestock farm of the case study;
- the slaughtering scraps and blood have protein and nitrogen properties that can be used as natural fertilizer for floriculture outdoors or in green houses. The meat residues (approximately 1.200 tons per year), after an appropriate treatment, can be used to raise the larva that are then used in the poultry raising business.

This renewed flow of products and materials shifts to focus to quality rather than quantity and it becomes vital to have an instrument for guidance and suggestions about the best forms of transfer.

To make waste “disappear” as a problem and cost we need to find, as shown in the case study above, users on the territory. Among the many users we need to choose the ones with the most compatible forms of production.

This way of thinking by connections also acts as a form of verification and activates retroactions on the process, sometimes concrete and radical turning points for production. In cases where a “natural” compatibility between output and input is not achieved, we are faced with the thing that humans call waste as well as the resulting economic, environmental and social costs incurred by such waste.

In this case the problem does not lie in the absence of “users”, but in the impossibility of finding them due to the nature of the raw material itself. The problem lies in the choice of the material and the lack of an overall vision of the process that goes beyond the central focus on the product and production. Unless we start by contemplating the raw materials, i.e. examining the nature of the inputs, the problem of waste will not be solvable except by artificial and costly actions.

To support this concept we would like to cite the case of NN Europe, a company of the American group NN Inc. which is a leader in the production of rolling ball bearings. Its production offers the market excellent quality ball bearings but entails significant problems essentially due to a linear vision of the process, closed to material exchanges with other manufacturers and opposed to technological innovations and transfers from other manufacturing sectors.

NN Europe

The most important issues found during manufacturing, and downstream of the manufacturing itself, involve the use of nonrenewable resources entering the company and production processes that are highly energivorous.

- The abrasive grinding wheels for the surface-finishing of ball bearings are produced with bakelite; in the production phase this thermo-hardening resin emits formaldehyde into the environment. Formaldehyde is a volatile substance that is carcinogenic if inhaled.
- Most manufacturing processes use nonrenewable mineral oils or solvents having a hydrocarbon base which cannot be accommodated by the environment. During the manufacturing process, these auxiliary liquids tend to emit vapors that are troublesome to workers and require specific (and costly!) air treatment processes.
- The traditional hardening processes are not very efficient; the ball bearings are heated in a furnace which involves the dispersion of energy and heat. In addition to this quenching process that occurs in vats of mineral oil which is nonrenewable and requires an additional washing processes.

The use of inputs from nonrenewable resources is a “premise” that is difficult to ignore and dramatically influences the outputs. They are nothing but an economic cost and an environmental problem because they are sent to be treated with special processes to “neutralize” them:

- the slimes with a solid base and water from the machining process are contaminated by mineral oil;
- the corn cobs used for drying the ball bearings are also contaminated by mineral oil and cannot be used as a resource;
- the kerosene, of hydrocarbon origin, is harmful and polluting;
- the same applies to the bakelite, which is equally harmful in the post-manufacturing phase.

Reduction to the point of total elimination of these waste products by conferring them as raw materials to specific manufacturers, in a sort of metabolization process, was not applicable because the nature of the raw materials did not allow it. The problem would not be solvable with

incremental improvements compatible with the current process but only through radical overhauls and a propensity for change.

With a systemic approach the research group discussed the product system as a whole, the inputs of materials and their flow, the techniques, the manufacturing phases and the energy consumption of each. All of this for NN Europe s.p.a. translated into its first goal: the challenge to produce in their own factory in Pinerolo (in the province of Turin) 16.000 tons of ball bearings without using auxiliary pollutant liquids.

We are talking about a significant reduction in the ecological impact of the company. The use of manufacturing inputs that are highly biodegradability, surface-active agents deriving from cornstarch and fatty acid from coconut, in a solution with water and sodium bicarbonate, perfectly replaced the hydrocarbon products that today are used in washing and lubricant-coolant processes.

“Sugar instead of oil” nicely sums up this suggestive innovation which is about to be launched into production. It is associated with the above-mentioned feedback operation enabled only through a systemic approach.

Observing natural phenomena, such as surface tension, allowed us to determine other forms of primary production, and use natural surface-acting agents to clean the ball bearings by surface tension. Later we used this method on other raw materials too.

We have looked at processes in Nature: their efficiency at ambient temperature and pressure, their capacity to induce the building of a system of symbiotic relations around them (mutuality, complementarity, subsidiary functions, etc.) by different species, their capacity to adapt their own “behaviors” to the specific context. Then we proceeded to search for natural alternatives to the other currently used raw materials that tend to further increase the environmental sustainability of the production process.

- The surface-finishing wheels can be produced with wood resins from the Ipe tree, a byproduct of the woodworking chain, just as strong and effective as bakelite but the resin does not pollute in the production phase and post-utilization treatment phases.
- The use of plant esters in the pressing phase will make it possible to eliminate the entirely mineral oil and prefigure new utilization phases downstream from their use in the company.
- “New” processes for induction hardening that are more efficient than the traditional furnace ones will use water for cooling instead of mineral oil; this leads to a reduction in the additional washing phases needed to eliminate the oil from the surface of the ball bearings.

Living systems in Nature are intimately connected to the environment by complex reciprocities that determine the continuous adaptation of one to the other. The systemic project, in conformity to this virtuous model, revitalizes the connections of the company with to own surroundings on the basis of the outputs it produces. Thinking by connections, which is typical of the systemic design approach, becomes the only feasible solution in the effort to solve the problem of waste.

In this sense raw materials, coming from nature, will facilitate their use as a resource even after they have become “waste” for the company that used them up to that moment. In Nature that which is damaging and not useful for some species is nourishment for other species. Thus the potentialities of nontoxic outputs become concrete in a value-adding “production chain”:

- the water used in manufacturing with a higher than average surface acting power will be treated through processes of phytopurification; precisely the characteristic which makes it unacceptable to be sent to the sewer allows the production of algae, water plants and the breeding of authoucthnous fish species;

- thanks to the elimination of the mineral oils, the corn cob for drying ball bearings will no longer be contaminated and can be used to cultivate certain mushroom species that are edible and have pharmaceutical uses. This method exploits the quantity of cellulose in the corn cob which today the company disposes of as waste;
- new and appropriate productive utilizations will be proposed for the high-quality steel scraps produced by machining surfaces, the elimination of which today is only a cost;
- grinding wheels made with wood resin have value added applications and have no negative effects on the environment.

4. Current legislation regarding waste

The scarcity of raw materials and the rising demand for recycled and recyclable materials trigger a process that tends to increasingly favor actions that upgrade the output materials. This necessarily surpasses the current best practices of waste treatment and recycling.

In this situation we have no choice but to find solutions to recycle waste in the most "profitable" way possible. In legislative terms there have been significant developments aiming to promote the complete recycling of waste.

The emergence of two new concepts, i.e. “sub product” and “secondary raw material”, reflects a clear effort to give legal autonomous dignity to the stuff that lies between "virgin" raw materials and actual waste.

In this sense Legislative Decree 16/01/08 No. 4 defines the term “sub-products” as the substances and materials which the manufacturer does not intend to get rid of, according to article 183, paragraph 1, letter a), and that:

- originate from a process not directly destined to their production;
- have a certain use, right from the production phase, that is integral and this usage occurs during the production or utilization process determined and defined a priori;
- meets the commodities and environmental quality requisites established to ensure that their usage does not cause emissions or environmental damage that is quantitatively or qualitatively different from that authorized for the plant where they are destined to be used;
- are not subjected to preliminary treatments or transformations to meet the commodities and environmental quality requisites mentioned under point 3, but have said requisites right from the production phase;
- have an economic market value.

“Secondary raw material” refers to all the substances and materials that meet the following criteria, requisites and conditions:

- they are produced by means of reutilization, recycling or salvaging operations;
- the origin, type and characteristics of the waste from which they can be produced is identified;
- the reutilization, recycling or salvaging operations that produce them are identified with particular reference to the procedures and conditions of those operations;
- there is a specification of the environmental quality criteria, commodities requisites and other conditions required for being put on the market, such as technical standards and regulations required for their use, taking into account the possible risk of damages to the environment or health deriving from the usage or transportation of the material, substance or secondary product;

- they have an actual economic trade value on the market.

However, in spite of the recent development in these terms, the current legislative scenario is not objectively favorable to concretizing open production systems for the total recycling of waste because the definition of waste provided by Legislative Decree No. 152 (2006), now replaced by Legislative Decree No. 16/01/08 no. 4, is “any substance falling under the categories listed in Appendix A which the holder gets rid of or has the intention or obligation to get rid of”. The aforementioned Appendix A is merely in an exemplification because the last category listed refers to “any substance, material or product that does not fall within the above categories”.

This definition is therefore based on the concept of disposal seen as an act of will or necessity that occurs when a company is unable to directly use that given ”thing” and therefore must eliminate it or sell it to another entity who can subject it to a treatment or recycling process.

Therefore we are putting forth an objective view of what defines waste, which will always be waste regardless of its final destination.

The principle of disposal has always given rise to a wide variety of opinions. The most natural has involved economics because the idea of waste is inevitably associated with the idea of its negative economic value.

How can we call “waste” an object that I get rid of if it has a market value, i.e. a positive value for which we can find persons and entities interested in purchasing it?

For years it has been said that the economic value is not important and that the definition should be taken to the letter, regardless of the contingent conditions.

In any event the problem of defining the concept of "waste" is finding an acceptable compromise between the two contrasting needs: the need for environmental protection which rightly makes us afraid that "disposal" without adequate regulations will lead to dispersion in the environment at the lowest possible cost; the need to not hinder the recovery and circulation of recyclable materials.

What is really lacking in the current legislation is precisely the "regulatory" acknowledgment of the existence or the possible realization of open systems or chains in which the flow of materials, understood as waste, would be considered holistic.

Each chain should be seen in its entirety and not as single phase independent of each other. From this perspective the so-called waste could move with a new sense of positivity and a certain dignity.

If each chain, as we are defining it here, and its components were registered and incentives were offered for their development it would become the interest of the chain operators to make the system work properly and productively.

5. Greatest innovations

The greatest innovation offered by this approach and the Database, besides its instrumental value, is its ability to open the minds of producers and make them aware that:

The problem of waste “disappears” if:

- complex relations are set up in which they can become the nodes of a network along which skills, know-how, well-being, matter (materials) and energy can transit;
- an overhaul is made of everything that occurs upstream of the waste without delegating responsibility to other operators;
- a remedy is brought to legislative terminology and instruments which are inadequate for building open production systems.

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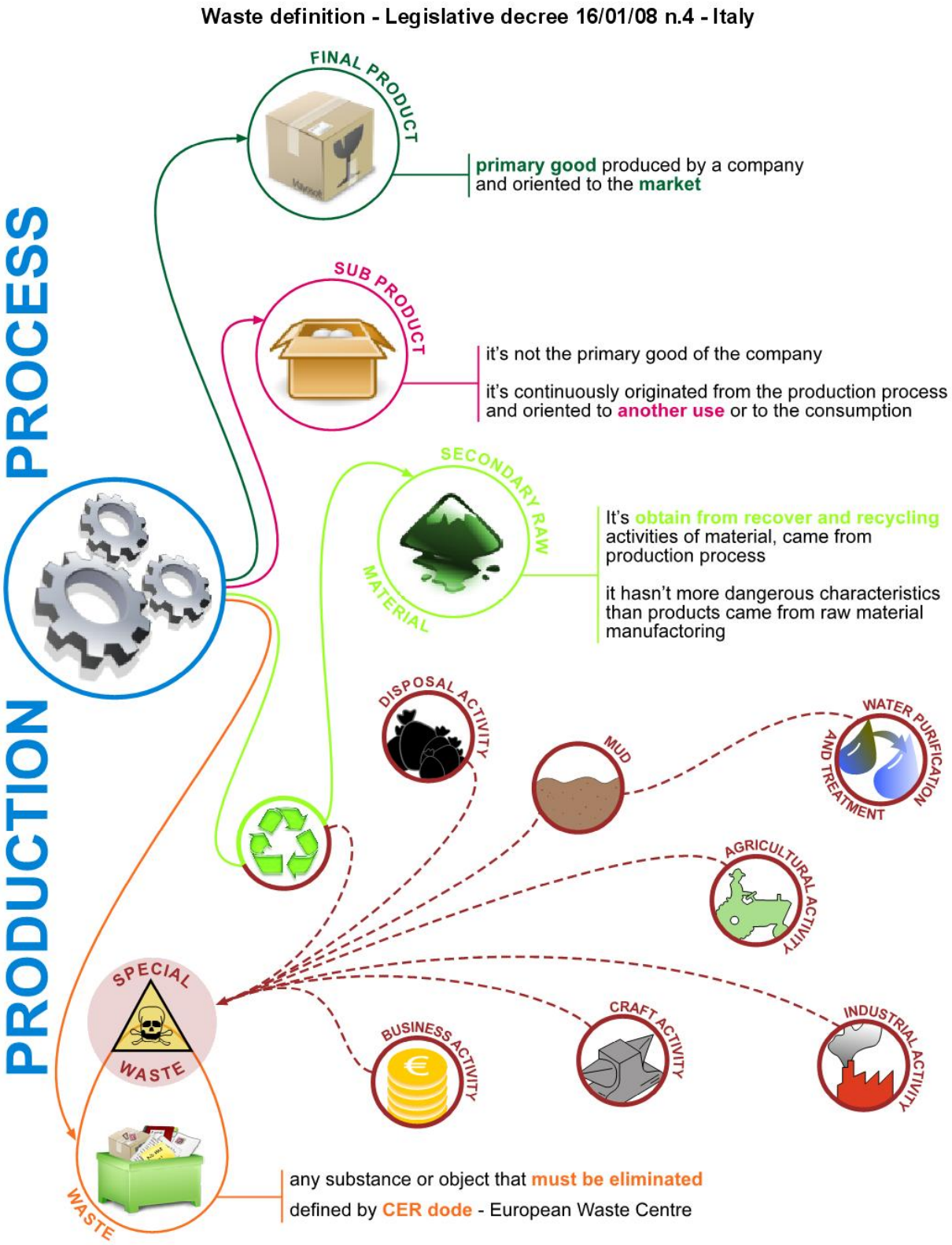

Fig. 1: Scheme of the output obtained from the actual linear production process and from other activities.

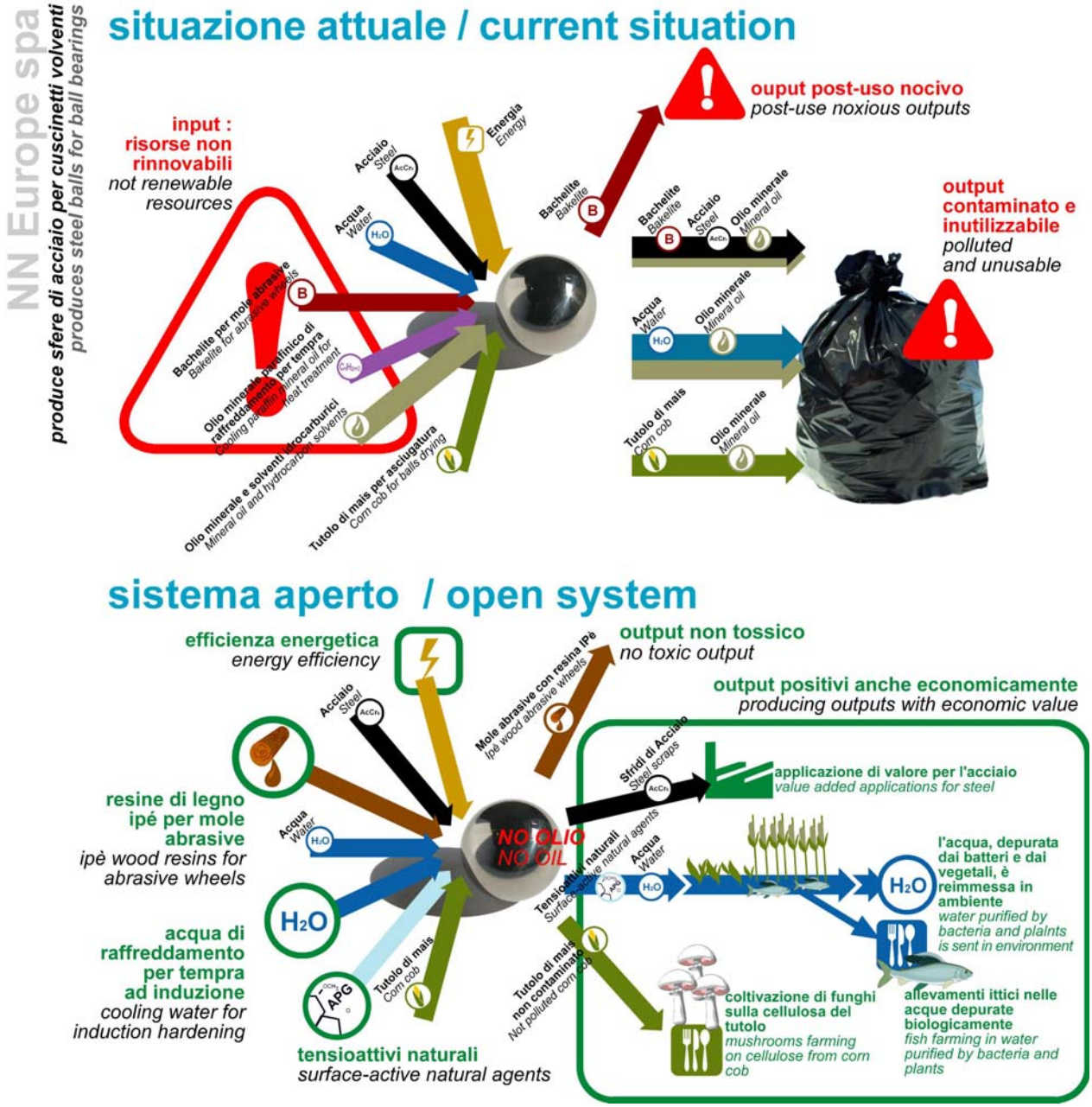

Fig. 2: Observing the working systems of nature and the systemic approach discussed production as a whole, the inputs of materials, their flow, techniques, manufacturing phases and the energy consumption of each and suggested the best forms of transfering outputs as resource.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Designing transition paths for the diffusion of sustainable system innovations

A new potential role for design in transition management?

Carlo Vezzoli[1], Fabrizio Ceschin[2] and René Kemp[3] [4]

Abstract

It is a shared opinion that the transition towards sustainability will be a continuous and articulated learning process, which will require radical changes on multiple levels (social, cultural, institutional and technological). It is also shared that, given the nature and the dimension of those changes, a system discontinuity is needed, and that therefore it is necessary to act on a system innovation level. The challenge now is to understand how it is possible to facilitate and support the introduction and diffusion of such innovations.

Bringing together insights from both *Design for sustainability* and *Transition management* literatures, the paper puts forward a model, called *Transition model of evolutionary co-design for sustainable (product-service) system innovations*, aimed at facilitating and speed-up the process of designing, experimentation, niche introduction and branching of sustainable such innovations.

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[4] The paper is the result of a collaboration between the three authors; nevertheless Vezzoli wrote chapter 3 and 5 and paragraphs “Objectives and background assumption of the model” and “Evolutionary stakeholder system maps: a new tool” in chapter 4; Ceschin wrote paragraph “Characteristics of the model”, “Phases in the evolutionary transition path” and “What the model aims at” in chapter 4; Kemp wrote chapters 1 and 2.

1. Introduction

It is a shared opinion that the transition towards sustainability will be a continuous and articulated learning process, which will require radical changes, on multiple levels: social, cultural, institutional and technological. It is also shared that, given the nature and the dimension of the required change, a system discontinuity is needed, and therefore it is necessary to act on a system innovation level.

Assumed that sustainability requires radical innovations in order to operate a system discontinuity, the problem is to understand how these innovations could have place and re-orient the dominant socio-technical regime. Therefore it is clear that it is fundamental not only to hypothesize and design promising system innovation concepts, but also to identify in a strategic way a transition path to facilitate the experimentation, niche introduction and scaling-up of such innovations.

In this paper we delineate a model of *evolutionary* co-design for product service system (PSS) innovations to fulfill needs in a more sustainable way. The paper discusses the potential contribution that System Design for Sustainability can have in creating sustainable system innovations. It outlines the key steps of a possible model of transition, describing how to involve the appropriate stakeholders (universities, public institutions, companies, NGO, user, etc.). how to set the basis for the development of a pilot project (to test and learn), and how to evolve this niche experiment in a self standing and replicable sustainable innovation.

From the discussion a new role for design emerges. A role that may potentially opens new fields of activity alongside the consolidated ones. A role in which design is not only aimed at designing a product sevice system but it is also aimed at promoting, facilitating and setting the conditions for the introduction of that product service system through the strategic definition of the key steps of the evolutionary transition path.

2. System innovation and transition management

Sustainable development is a complex concept, dealing with different temporal and spatial scales and with multiple stakeholders (Martens, 2006). It indicates a process of changes whereby the development goal is not clearly outlined and is subject to changes throughout the process. (van Zeijl et al. 2008). Reduced environmental impacts is one element. This may be achieved through green products and greener production processes. Reduced impacts may also be achieved by system innovations, i.e. transformations changes in systems of provision and behaviour (Weaver et al. 2000; Rotmans et al. 2000; Smith et al. 2004). Examples of system innovation are: the hydrogen economy, industrial ecology and customised mobility.

System innovation cannot be designed in a top-down fashion because system innovations are the outcome of co-evolution processes. New knowledge is being created, new institutions and associations emerge out of processes of sociotechnical aligment. Various designs are explored and get perfected, some of which are abandoned. We have problem sequences and response strategies. System innovations involve various elements and processes, each of which is feeding on the other. There is an element of self-organisation: structure emerges out of interaction. For managing transitions processes the model of transition management has been proposed (Rotmans et al. 2001; Kemp et al. 2007). Transition management is a form of process management against a set of goals set by society whose problem-solving capabilities are mobilized and translated into a transition programme, which is legitimized through the political process (Kemp et al. 2005). Transition management relies on the interaction between processes at three levels (Loorbach 2007):

- *Strategic level:* processes of vision development, strategic discussions, long term goal formulation, etc.

- *Tactical level:* processes of agenda-building, negotiating, networking, coalition building, etc.
- *Operational level:* processes of experimenting, project building, implementation, etc.

The processes and outputs of the processes differ at each level (visions, strategies, agenda's, projects) and 'co-evolve' throughout the process. Through a process of partisan mutual adaptation against collectively chosen goals new interaction patterns, policies and socio-technical trajectories emerge, in a self-organised manner rather than through steering from the top. Sustainability concerns are expressed as part of the process. It is used in the Netherlands for managing the transition to sustainable energy, sustainable mobility, sustainable agriculture, sustainable water use and the biodiversity and natural resource transition.

Transition management breaks with the old planning-and-implementation model aimed at achieving particular outcomes. It is based on a different, more process-oriented philosophy. This helps to deal with complexity and uncertainty in a constructive way.

It is a model for working towards comprehensive changes in society, in an adaptive, forward-looking way, relying on processes of variation-selection-retention. It is not a model for managers who want to successfully manage an innovation process. But as we will show, elements of the model can be used for managing sustainable product-service system innovations.

3. (Product-Service) System innovation and design: the new research challenge

It has been argued above that if we assume sustainability seriously, we need radical innovations in the consumption and production system, and so a system discontinuity is required. Therefore, in order to seriously tackle the transition towards sustainability, system innovations should take place.

Within the wide debate on the definition of system innovation, design researchers have usually referred to the so called Product-Service System. Among the several converging definitions the one given by the United Nations Environment Programme (UNEP 2002) says that a system innovation (referred to as Product-Service System, PSS), is "the result of an innovative strategy that shifts the centre of business from the design and sale of (physical) products alone, to the offer of product and service systems that are together able to satisfy a particular demand". Even though the definition might differ from author to author (or from discipline to discipline), we can agree that we are talking about something broader than just product innovation, and so that it is not only a matter of technological innovation, but socio-cultural and organisational one as well. So when we talk about (product-service) system innovation, it is meant an innovation that involves all the different socio-economic stakeholders in a "satisfaction system". In this sense we mean that it is adopted a satisfactory approach, where the focus is no longer the function delivered by a single product, but on the system of products and services (and related stakeholders) that together fulfill a given demand of needs and desires: in fact a given demand for satisfaction. In other words the design reference has no more to be the "functional" unit but the "satisfactional" unit[5].

About (product-service) system innovation and sustainability, it is a shared opinion that these innovations could potentially lead "to a system minimization of resources, as a consequence of

[5] The use of this terminology meets with other authors' interest. Meadows (Meadows, Meadows and Randers, 2006) uses satisfaction in a formula5 to evaluate the limits of growth, in a 30-year update of the previous book known worldwide, "Limits to Growth", modelling the consequences of a rapidly growing world population and finite resource supplies, commissioned by the *Club of Rome*. Marks et al. (Marks et al. 2006) argues that among various indicators measuring personal well-being in the framework of transition towards sustainability, satisfaction seems to be preferable.

innovative stakeholder interactions and related converging economic interests" (UNEP 2002). In other words the potential eco-efficiency of system innovations derives from a new convergence of interest between the different stakeholders: innovation not only at a product (or semi-finished) level, but above all as new forms of interaction/partnership between different stakeholders, belonging to a particular value chain, or "value constellation" (Normann and Ramirez 1995). In other terms, this innovation model can raise the system eco-efficiency through innovative stakeholders' interactions.

In this perspective by both design researchers and transition management theorists a significant ambit in which to act to promote radical changes for sustainable consumption and production, is the widening possibilities for innovation beyond the product, towards innovation of the system as an integrated mix of products and services (and related supporting stakeholders) that together lead to the satisfaction of a given demand for well-being (Goedkoop et al. 1999; Brezet 2001; Charter and Tischner 2001; Manzini and Vezzoli 2001; Bijma, Stuts and Silvester 2001).

In this framework, what role for design? The introduction of system innovation for eco-efficiency into design has led researchers to work on defining new skills of a more strategic nature, that aim at system eco-efficiency through the stakeholders' strategic convergence of interests, and are coherent with the "satisfaction-based", "multi-life-cycle" perspective. In synthesis, the main characteristics of the system design for eco-efficiency approach are: a satisfactory approach (demand-satisfaction design); a stakeholder interaction approach (stakeholder's configuration design); and a system eco-efficiency approach (ecoefficient-oriented design). In this perspective design activity should focus on (Vezzoli 2007):

- promoting and facilitating new configurations (partnership/interaction) between different stakeholders, to find innovative solutions able to lead to a convergence of economic, social and environmental interests;
- facilitating a participatory design process among all the stakeholders while developing environmentally sustainable products and services together;
- orientating the design process towards eco-efficient solutions.

It has to be underlined that not every (product service) system innovation is eco-efficient (Tukker and Tishner 2006), and therefore it is of key importance to adopt appropriate methods and tools when designing new systems (with the potentialities to be radically sustainable)[6].

At the present time it is possible to state that the concept of (product-service) system innovation has been deeply studied at the academical level, and in the last years knowledge has been produced, accumulated and shared on understanding system innovation's characteristics, potential benefits (for companies, government, society, users and environment), barriers to adopting it, possible rebound effects, etc. In particular, in relation with the design of (product-service) system innovations, we can say that, within the researchers community, different methodologies and tools have been developed (and tested) to orient and support the design process towards the definition of sustainable system innovation concepts.

But to all this knowledge developed at the academical level corresponds a limited application of sustainable (product-service) system innovations by companies. In this sense several barriers can be identified (UNEP 2002; Mont 2002): for the user the cultural shift necessary in accepting a ownerless consumption; for companies the difficult in implementing the substantial changes required in corporate culture and organisation to support a service-oriented business, the

[6] The first design methods and tools that have been recently developed as outcomes of some European projects of the 5th Framework Programme, are PROSECCO (Product & Service Co-Design process), HiCS - Highly Costumerized Solutions (Manzini, Collina and Evans 2004), and MEPSS - Method for PSS development (van Halen, Vezzoli and Wimmer 2005).

resistance in changing the traditional business concept, the lack of knowledge and experience in design methods and tools and service management systems, and the difficult in evaluating the environmental and social features of a (product-service) system innovation; for governamental institutions the difficult in defining and implementing policies to facilitate the companies' adoption of system innovations.

For these reasons it is possible to state that now the research challenge is to understand which could be the proper conditions to: foster the adoption and dissemination of sustainable (product-service) system innovations, foster the knowledge transfer from university research centres to companies, and foster the involvement of the other key stakeholders in supporting these processes.

In this perspective it seems promising to view PSS as the co-design of a radical innovation, but even as transition path to achieve it. Key point is to introduce a process-oriented design, rather than a traditional design-and-implementation approach.

Within this context universities could potentially play an important role. In particular for design universities a field of action could be the involvement of key stakeholders in order to facilitate the ideation of promising and sustainable system innovation concepts, and in order to define new strategies and modalities to accelerate the experimentation of such innovations and foster their introduction in the "real world". In this sense universities can represent the pivotal actor in starting out a transition process, facilitating the strategic conversation between the different socio-economical stakeholders and the community, and facilitating a continuous learning process between them. A model, in which university could become a "facilitator" in starting out and accelerating a partecipated process for the introduction and dissemination of sustainable system innovations, is presented below, integrating objectives and approach of the *Transition management* theory[7].

4. A transition path of evolutionary co-design for sustainable system innovations diffusion

Design and system Innovation for Sustainability (DIS) research unit (Politecnico di Milano – INDACO Department), is currently working on some research projects (for example the *VDS*[8] project and the *University chair for innovation*[9] project), in which the aim is to design a sustainable system innovation concept, together with the strategy for its introduction and subsequent scaling-up, or better still branching.

Within these project has emerged a draft model, called *Transition path of evolutionary co-design for sustainable system innovations diffusion*, aimed at facilitating the designing, experimentation, introduction and branching of sustainable system innovations. It is based on the *Transition management for sustainable consumption and production* model, and at the present time represents a first draft, a work in progress. Nevertheless it is currently tested in the previously mentioned projects, in order to understand its feasibility, strenghts and weaknesses.

We are aware that there is the need for further reaserch and the need to realize field tests; however it has been likewise decided to present the intermediate results to the scientific community, with the intention to start out and stimulate a constructive dialogue and discussion.

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[7] We are talking of the *Transition management for sustainable consumption and production* model, developed in the Netherlands by Rotmans, Loorbach and Kemp (see Kemp et al. 1998, 2001, 2004, 2006)

[8] The Vehicle Design Summit (VDS) project, run by an international Consortium of Universities coordinated by the Massachusetts Institute of Technology (MIT) of Boston, aims at designing, prototyping and producing an eco-efficient vehicle as well as defining an innovative and sustainable business model to introduce and diffuse it into the market. It will be described later in the paper.

[9] Within this research project (run under the UNIDO's umbrella), the role of DIS research unit is to cooperate with some African universities (Universitè Polytechnique De Bobo-Dioulasso, University of Zambia and University of Lagos), in order to design and introduce sustainable mobility solutions for local low-income contexts (see Vezzoli and Ceschin 2008).

Objectives and backgroung assumptions of the model

The main objective of the model is to support, orient and facilitate the development of the conditions for the experimentation, niche introduction and branching of sustainable system innovation concepts, with university research context as starting point.

In other words the model aims at fostering a transition process towards the adoption, dissemination and continuous development of sustainable system innovations.

As it has been pointed out before, system innovations require changes on multiple levels (social, cultural, institutional and technological), and in this sense they can be considered radical innovations. For this reason, when talking about (product-service) system innovations, it is proposed to imagine such innovations not only as static outcome of a design and development process, but it is necessary (first background assumption), within a transition paths to be designed and managed, facilitate and support the introduction and subsequent branching of such innovations.

It is called evolutionary process because it aims at diffusing new “mutation” in the system as a result of the environmental feedbacks reinforcing them, to substitute existing un-sustainable system of production and consumption. The words design and management are added to emphasize that these are not casual mutations, but oriented by the sustainability goals. And these casual mutations are designed and managed in the sense that they draft possible paths to be pro-active, hence speeding up the evolutionary process (that in nature, we know, has its foundation in long time processes).

It is also assumed (second background assumption), that university may represent a possible pivotal actor within that transition process. In this sense they can potentially act facilitating the starting out of this process, orienting it towards sustainability, involving different socio-economical actors and favouring a continuos knowledge exchange. In this sense university could represent the promoter of innovative stakeholder arena (and their interactions), and the facilitator in starting-out and orienting a multi-stakeholders process aimed at designing, introducing and branching sustainale system innovations.

To be more clear university could assume a strong role in the first part of the process (starting-out and orienting), and then could “pass the baton” to the socio-economical actors which in future could become the providers and the users/beneficiaries of the (product-service) system innovation. And so a university that activates the other actors of the system in an increasing involvement: in the beginning they only give feed-backs; then their role become central with universities giving support; and later they become autonomous in realizing and scalin-ug the product-service system concepts.

Characteristics of the model

What are the characteristics of the elaborated model of evolutionary transition path? The model can be defined as a *strategic orientation* and *adaptation* of the steps that, starting from an university research context and through a continuos and iterative multi-stakeholder learning process, brings to the experimentation, niche introduction and scaling-up/branching of sustainable system innovation concepts.

To be more clear, first of all we can say that this is a transition path which is co-elaborated and adapted by a plurality of actors (universities, research centers, public and private companies, NGOs, governamental institutions, community, etc.), and in which university acts as “promoter” and “facilitator”, assuming a key role in the first part of the path, and passing the witness to other socio-economical stakeholders in the second part of it.

Secondly, it has to be remarked that we are dealing with a process of continued learning (for the involved actors), because the transition path is based on continuous experimentations and consequent feed-back processes.

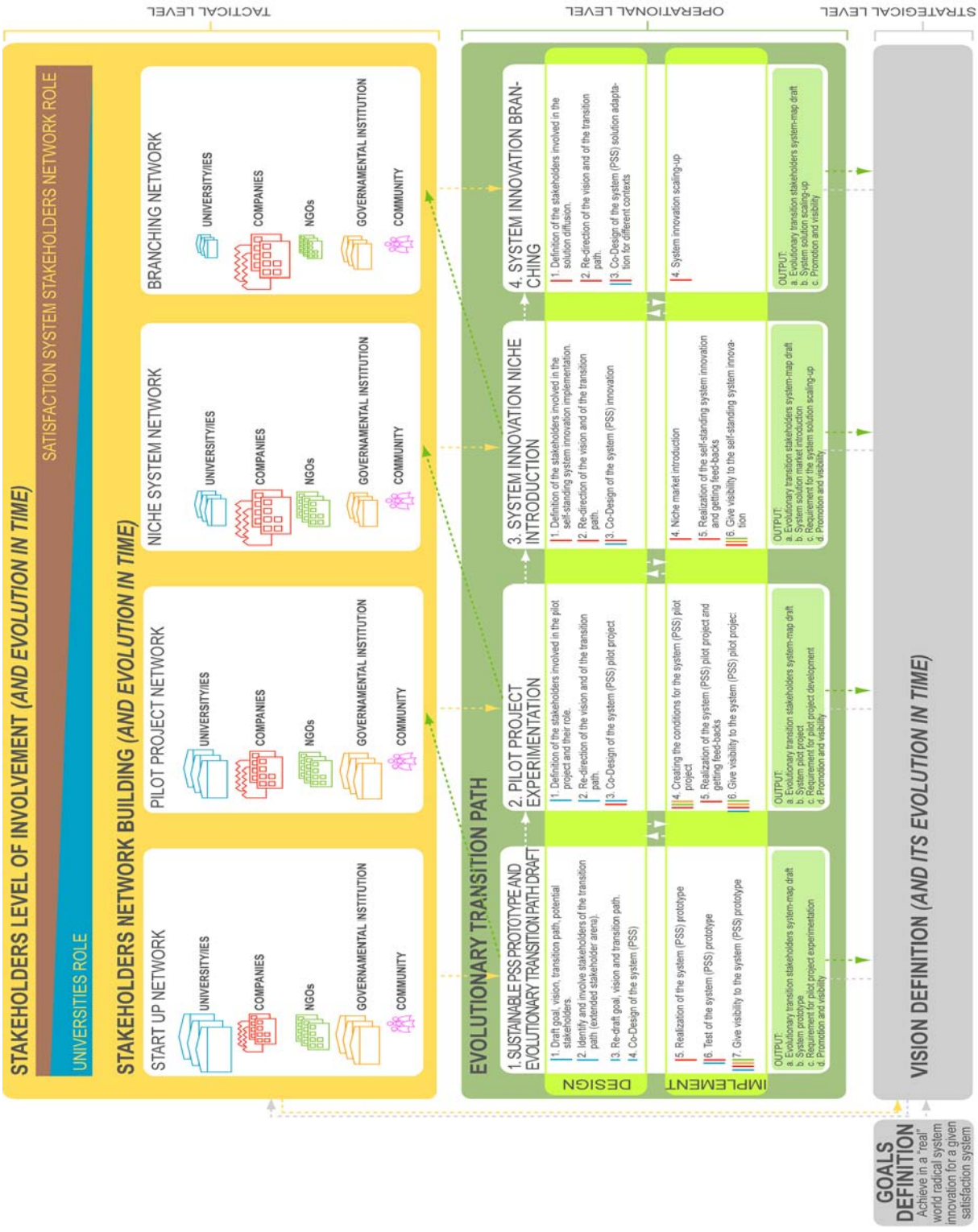

Fig. 1: the transition path of evolutionary co-design for sustainable product service system innovations, in which are illustrated the four transition phases and the stakeholders network evolution needed to carry out each single phase.

Moreover it is a process of *strategic orientation*, in the sense that the transition path is based on the definition of goals (to be achieved), and on the consequent building-up of a vision (of how to achieve these goals); this means that the steps of the transition path are oriented to the achievement of the defined goals, and are affected by the built vision.

Furthermore we are dealing with a process of *adaptation*, just because the transition path is based on a continuous learning; this implies that the vision can be adapted and modified in time (in relation to the context and/or stakeholders evolution), and consequently the same can happen for the single steps of the transition path. Moreover the entire transition path can be defined as a process of mutual-adaptation between the proposed system innovation and the context -or socio-technical regime- inside which such innovation has to be experimented and introduced; in fact both the context and the proposed system innovation evolve and affect each other.

For these reasons the transition model can be defined an “evolutionary” process, because it is characterized by a continuos evolution and adaptation of the transition path, but also of the proposed system innovation, and of the involved socio-economical actors. More precisely we are dealing with a *controlled* and *accelerated* “evolutionary” process, in the sense that the proper conditions to facilitate and speed-up this process are designed and created. And for proper conditions it is meant the conditions by which the involved actors can: collect in an effective way all the feed-backs coming from the experimentations; analyse these feed-backs; and use it for a system improvement. In this perspective it clearly becomes foundamental the setting-up and development of an appropriate stakeholders network, capable to adapt itself in time to better collect and analyse feedbacks (and in general to support the different steps of the transition path).

In synthesis, the model of “evolutionary” transition path (see fig. 1), is based on the definition of goals and the building-up of a vision, which includes the drafting of the stakeholders’ interactions evolution in time; the vision effects the steps of the transition and the stakeholders network configuration needed to carry out each single step; in turn the transition steps influence the vision definition and the stakeholders network building (in a continuous iterative process).

Phases in the “evolutionary” transition path

Seeking for clarity, in the model of “evolutionary” transition path it is possible to identify four main phases. It has to be remarked that the transition path, although being described as linear, in reality is an iterative process, with continued feedbacks; moreover the various steps are not distinctly separeted but overlaps each others. Nevertheless the four conceptualized phases are:

- *Sustainable system innovation prototype and evolutionary transition path draft.* As said before university plays a key role in this phase, representing the promoter and the facilitator. In fact, starting from a given satisfaction system (e.g. urban people mobility), university drafts goals, visions and transition path with relative potential stakeholders. Afterwards it fosters the building-up of a first stakeholders network (including research centers, companies, NGOs, institutions, media, the community etc.), which, in a partecipated process, develops and modifies the previously proposed visions and transition path. Starting from the implemented vision, a co-design process is carried out to define promising sustainable system innovations; the most promising ones are then prototyped and tested. At the same time the network acts in order to give visibility to the project and to the prototype.
- *Pilot project experimentations.* Starting from the results of the previous phase, the stakeholders network (which meanwhile has been adapted and/or integrated, and in which there is a lower university involvement), re-defines and re-directs the previously elaborated visions and transition path. Afterwards the network co-designs, realizes and controls one or more pilot projects, that are socio-technical experimentations to test the system innovation concept. The aim is to facilitate the learning of all the involved actors, in relation to the weaknesses, strenghts, barriers, cultural, political and economical acceptability, etc. of a possible market introduction of such innovation. These experimentations represent a continuous iterative learning process, involving with different roles all the stakeholders in: setting the conditions for the pilot project realization; analysing the pilot project experimentation results; and proposing modifies and integrations. In other words it is a process of feedbacks that may lead to the

adaptation and adjustment not only of the pilot projects characteristics but also of the vision. Moreover these pilot projects could represent an optimum “window” because of its potential to show sustainable innovations ideas to wider communities. In this sense they could be used not only for experiment ideas, but also for attracting new potential interested actors.

- *System innovation niche introduction.* What has been learnt during the experimentations should brought to the adjustment of the characteristics of the (product-service) system innovation, and to the definition of the modalities by which it can become economically sustainable and self-standing. In this sense the most promising pilot projects are selected, implemented and introduced into the market.
- *System innovation branching.* If the market introduction has been positive, it could become a model that can be replicated, imitated, adapted, developed and integrated. In other words it can be scaled-up and potentially contribute in destabilizing and re-orienting the dominant socio-technical regime. It has to be underlined that until the third phase the key actors could remain substantially the same (with an increasing role for companies and a lower university involvement); on the contrary in the fourth phase totally new actors could have a part in autonomously adopting, adapting, replicating and developing the system innovation concept.

As said before the transition path is described as it were linear, but it is important to underline that a cyclical and iterative process takes place. The cycical character of the transition is illustrated in fig. 2, in which are represented the continuous repetition of four main activities (Kemp 2006): establishing and further development of a transition arena (A); development of sustainability visions (B); initiation and execution of projects and transition-experiments (C); Evaluation and monitoring of the transition process (D).

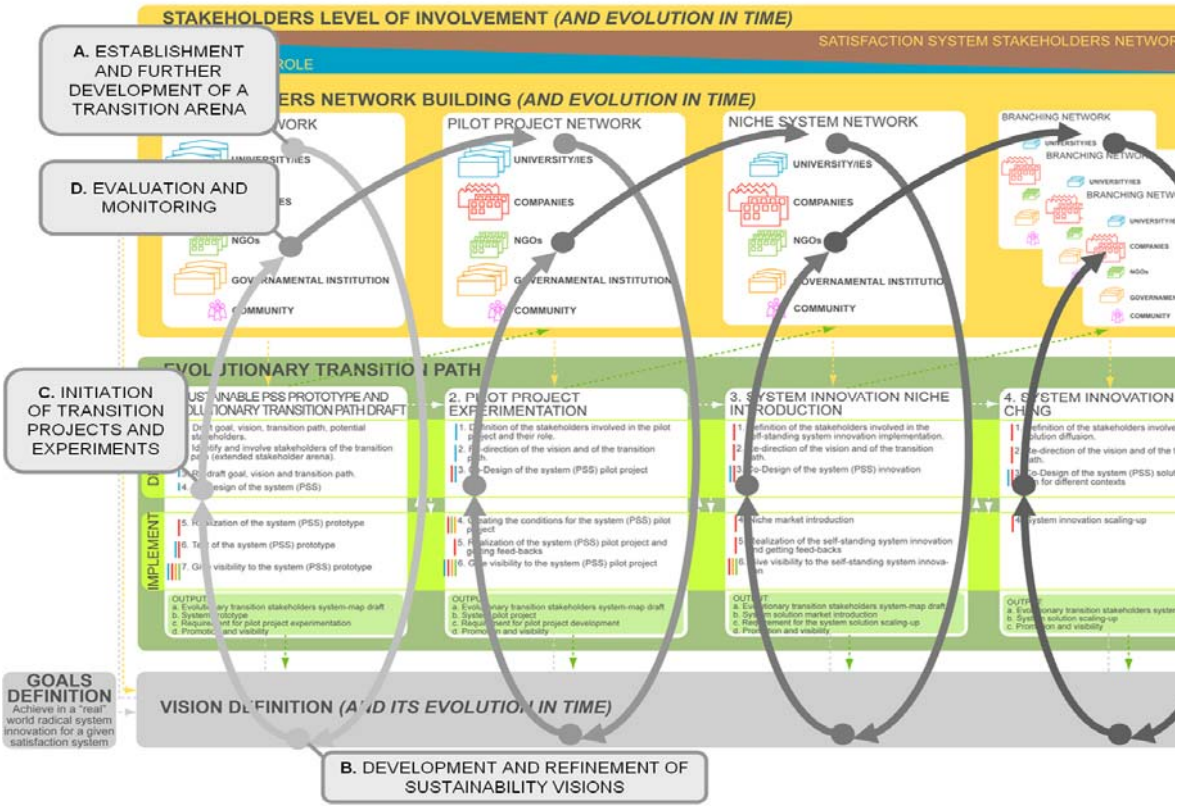

Fig. 2: the cyclical character of the transition path.

Moreover it is important to highlight that in the described transition model we took in consideration a process in which, besides universities, companies assume a key and foundamental role along the entire path. But this is not the only possible way. We can also imagine bottom-up innovations that start from self-managed groups of people –the so called creative communities (Meroni 2007)– and then are implemented, replicated and scaled up by other groups of people; or in alternative these innovations can likewise starts from a particular creative community, but then are developed, industrialised and branched by companies. However in any of these cases university can act as facilitator and promoter.

“Evolutionary” stakeholders system maps: a new tool

It is quite obviuos that, in the previously described transition process, it is very important a multi-stakeholder and multi-disciplinary approach. Therefore the identification of the stakeholders (and of their roles, motivation and mutual interactions), is a fundamental aspect in setting the proper conditions to support this process. In other words it is vital the creation of a network made up of different socio-economical stakeholders. In general terms we can have:

- *Universities,* because, as it has been explained before, they could represent the promoter and facilitator of the process.
- *Companies,* because they can provide technical feed-backs, competences and financial resources; they are interested in participating because there could be the opportunity of a new market, for a possible reputation comeback, or for acquiring new know-how.
- *Local Administrations and Institutions,* because they can provide financial resources or facilitations; they are interested in being part of the process if the system innovation concept is coherent with their objectives.
- *NGOs,* because they can support and create interests around the project; they are interested in participating if the system innovation concept is coherent with their values.
- *Media,* because they have to create interest around the project.
- *Users,* because of course they are fundamental in testing and experimenting the system innovation.

All these actors take part (with different roles and levels of involvement), in a process of co-production of knowledge and co-definition of the transition path. Nevertheless it is important to remark that the stakeholders involvement is not an action that starts and ends in the beginning of the process, but is a continuous and iterative activity along the entire transition process. This means that there is the need to define not only which actors include but also when involve them (in which phase of the transition process), and at what kind of level they have to be involved.

In other words we are dealing with a stakeholders network which is not static, but dynamic, because the actors and also the related interactions could deeply change along the path. A network that has to be capable to evolve in time in relation to the specific needs. And it has to be underlined that this evolution represents an important and fundamental element of the entire transition path. Element that represents itself a design activity.

If we can use a metaphor we can say that it is a sort of relay race in which we have several “baton passages” between different stakeholders networks. And to cross the finishing line more quickly (as the sustainability challenge requires), different actors/runners have to use their energies, each for its piece of path. A common path in which the first actors/runners have to know to which actors pass the baton, as well the second actors/runners have to know which are the third ones, and so on until the achievement of the goal. In this sense, in order to speed up the process, it becomes foundamental forsee which potential actors could be involved and have a part in each phase. And in this strategic anticipation a key role could be played by design.

In fact what is new here is the proposal to design, together with the draft of the transion path, the evolutionary stakeholders system map (ESSM), that is the potential stakeholders network, and its evolution in time, needed to carry out the transition path. And this ESSM represents itself a new tool to be used to forsee the appropriate stakeholders to be increasingly involved, and to facilitate the strategic conversation with them. In this sense the tool can be used in the beginning of the process by universities (that it is assumed to be the promoter of the process), to draft the transition steps and the potential stakeholders to be involved. In other words it is used to draft a first vision of how the transition path could be and which actors involve; and this vision could result fundamental in stimulating a first discussion with the potential stakeholders to be involved. In this sense the model is also a tool to start and facilitate the strategic conversation with other actors, and to build-up a shared vision.

What the model aims at

It has been already said that the main objective of the model is to orient and facilitate the development of the conditions for the experimentation, niche introduction and scaling-up of sustainable system innovation concepts, starting from a university research context. So, in general terms, the model aims at supporting a complex process by facilitating multi-stakehoders activities towards the achievement of a shared vision. In other words it is a methodological framework by which facilitate, foster and orient such transition processes.

In particular the model helps to define which key general actions have to be carried-out in the various transition phases, in relation to the system design activities and the system implementation activities (see fig. 1). It helps in defining the activities that have to be done but also the actors that potentially could manage each single activities. In other words the model facilitates the setting-up of a flexible stakeholders network to support the accomplishment of each single phase.

Before it has been underlined the importance of involving various socio-economical stakeholders, and that this can be considered a design activity. In this sense the model can facilitate the design process towards the definition, integration and adaptation in time of a system of multiple actors, identifying the proper stakeholders, understanding and converging together their motivations, defining their roles, mutual relationships and levels of involvement. In synthesis the model supports the stakeholder network definition and its continuous evolution in time.

Moreover the model fosters the adoption of an anticipative, cyclical and iterative approach (the previously mentioned cyclical character of the transition), based on continuous experimentations, feedbacks collection and analysis, and system improvements. In this sense it facilitates a continuous learning process and knowledge exchange between the various stakeholders involved.

Finally the model represents a methodological framework that allows the use of other design tools and method in a coordinated way. Tools such as the *Design Plan Tool-box* (Jégou, Manzini and Meroni 2004), to help different stakeholders in communicating and developing solutions together, and *the Sustainability Design Orienting (SDO) tool-kit* (Vezzoli and Tishner 2005), to orient the design process towards the definition of sustainable solutions; methods such as the *Scenario building* (Manzini and Jégou 2004), to facilitate the generation of shared visions. In this sense the model facilitates an integrated and coordinated use of these tools, supporting co-design processes aiming at accelerating the stakeholders adoption of new and sustainable production and consumption patterns.

As said in the beginning of the section we are aware that this model represents a first semplified version. Nevertheless it is currently tested in some research projects, for example the Vehicle Design Summit (VDS) one, run by an international Consortium of universities coordinated by the Massachusetts Institute of Technology (MIT) of Boston. The Consortium’s goal is to design and realize a low environmental impact vehicle as well as the definition of the conditions for its

introduction into the market (firstly the Indian one), through innovative and radical sustainable "mobility offers". The final aim is to influence and re-orient the whole automotive sector towards the adoption of radically more sustainable offer modalities and consequent production strategies. In this framework Politecnico di Milano work team[10] designed an innovative and eco-efficient business model[11], and delineated, using the previously mentioned model, a promising transition path to introduce and diffuse this model into the market. At the present time the produced results are now used by other work teams to select and involve the potential stakeholders to test and implement the proposed system innovation concept.

Of course the model needs to be developed and detailed, and in this sense it will be tested in further researches. At the same time we believe it was already worthwise to put it to the attention of the scientific community to open-up a debate, we hope, fruitfull of interesting results.

5. Conclusions: a new potential role for design in transition management?

At this point a proper question could be: which role could be played by design and design university in transition management?

Before it has been underlined the importance of adopting a general design attitude to pursuit (product-service) system innovation. In this sense design could result strategic not only in the definition of the system innovation characteristics, but also in drafting and adapting in time the stakeholders networks, in order to set the basis for the introduction and proliferation of that kind of innovations.

In other words design could play a key role not only in orienting and supporting the design process towards the definition of environmental and socio-ethical sustainable system innovation concepts, but also in designing the proper conditions to foster and speed-up the experimentation, niche introduction and branching of such innovations, through the design of innovative stakeholders' interactions, and their evolution in time. In this sense design could act as "promoter" and "facilitator" for the co-creation of the conditions to foster and speed up such kind of transition processes.

Moreover, as we have seen before, in such transition paths universities could result foundamental, representing the pivotal actor capable to involve, enable and guide other socio-economical actors in experimenting, introducing, adopting and developing system innovation concepts.

In conclusion the paper pones two main working hypothesis to be verified with further research and field tests:

- that design could result strategic in facilitating the setting-up of the conditions for the experimentation, introduction and scaling-up of sustainable system innovation concepts, through foreseeing the potential actors to be involved and facilitating the strategic converstation between them;
- that in this transition path university could act as key actor, promoting and facilitating the whole process.

[10] The work team is made up by the students Lorenzo Davoli, Francesca Fiocchi and Jun Lin, coordinated by Carlo Vezzoli and Fabrizio Ceschin (research unit Design and system Innovation for Sustainability, INDACO dept., Politecnico di Milano).

[11] In brief he alternative business model is characterized by: an approach to mobility as the scope of design; an innovative stakeholders network (including actors like energy supplier, insurance company etc, which usually work autonomously with the value chain); a shift from selling products (car, fuel, etc) to selling results (access to mobility); a change in product ownership; and a consequent change in vehicle design. For details see: Vezzoli and Ceschin 2008 (II).

The hypothesis seem worthy to be further investigated, that means new source of funding should be search and before institutions should understand the importance to assume these as one of the articulate research strategies and fund-raising.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

NON-DESIGNED DESIGN

A Study on Unprofessional and Non-productive Design in Shanghai

Yong Qun CHEN

Abstract

Design should not become a consumption behavior neither wasteful objects for rich people. Design can be brought to be a motive force for the changing of human society and its development. The research of the subject is to study the practice of the informal design in Shanghai, which indicates to those impromptu works for improving living condition made by common people. The way of solve problems represents a significant meaning for the real life. The conception and definition to this sort of creative practice can be called “Non-designed Design”, or unprofessional and non-productive design, and its spirit is in fact closer to the truth and genuine meaning of design.

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Non-designed Design Definition

Non-designed Design refers to an “alternatives” practice without conscious of design. Most of practitioners are living at the bottom of urban pyramid. These Shanghai common people recreate their life necessities to improve the daily living conditions. Limited by the economic resources, they reuse those materials mostly are free of charge and easy to be accessed. Non-designed Design practice is a kind of unique creation, and it is a process of consciously learning, introducing and reinventing the subliminal invention. It is unconventional and distinguished from our “good” professional and productive design. This kind of informal design shows common people’s wisdom and adoption to living environment.

A Significance of Non-designed Design Practice

Non-designed Design is a central driving force pushing forward us to change our conception and perception on design. When we inspect current design practice and reviewing the value of Non-designed Design practice for life, the meaning on design would be adjusted.

The Background and Introduction of the Study

In this study, the method of the research is not based on a theoretical study on varied literatures, but the phenomena in the reality.

Non-designed Design practice makes a mockery of our formal design (professional design) and the role it has played in society. The study is to question the definition of design and practice we have conventionally. The composition of the study was aroused by my intuition to “mainstream” of design phenomenon in the world.

In China, out of instinct, the informal constructive practices for living environment are very common and constantly revised as the complex social reasons. At the same time, this sort of social behavior has never been interrupted in the history and got respect from the formal design practice and authorities. But its importance, extended scale, and the meaning in the changing of urbanization throughout of the country have been ignored.

Non-designed Design holds a gesture against the formal design out of the official campaign. In the context of constitutional roughness and partial out-of- control, Non-designed Design creator rebuilt their environment spontaneously through a bottom-up approach. Different from the formal design, the construction of the Non-designed Design is random, un-linear and self-organized. Consequently, it is more flexible and adaptive to the change of life. Today, the formal design emerges as the service consumed more and more by current elite Chinese and those from privileged classes who are capable to pay the fee. Therefore, the original significance of design practice has been totally forgotten.

The Shadows of Contemporary Design

In today’s changing world where human development is progressing, how does design play a significant role? What sort of creative spirit is properly approaching the essence of design and its origin? Our conception on design practice should be reviewed by answering the following questions and principles:

Question 1: Where could we see genuine meaningful design in our life today?

We could not see many, even some we can see but to have them applied in life, it would cost too much money and cannot be afforded by common people. In those called “formal” or “good” designs, they are mostly with chic shapes, forms, unique presentations or in a mass production. They are endless and new artificial objects, which could not be used for more than a few years. Because these “chic” stuffs are so easily out of fashion

that should be replaced by new designed things. Dose design only work for the ornaments of life, stylish artificial objects, novel ideal and goods?

Question 2: How could design play a real significant role in our society, while is rapid changing with wildly new techniques applied and global warming?

The objectives of design practice are basic and aimed at three targets: First, design should lead our living ways, furthermore, design should help to establish a healthy living system rather than turn off to good looking things only. Secondly, design certainly should solve our varied life problems to enhance our living condition and quality. Thirdly, design should turn unfavorable factors into favorable ones for our ways of life and living activities.

Question 3: How could design lead our life and human to a right direction in the future?

This is a very significant aspect for designer. In the design practice when a designer is considering the application of design in reality, and reviewing its meaning of the result to the human social development in a rational way, doubtlessly design in fact will be abused by profitable power.

What Changed and Changing What?

In recent years, our living environment have been changing and moving on, and it is unbreakable mixed with artificial designed objects and varied air made by human being. We cannot escape from the reality. It is always difficult for us to find and meet the interactive things in the souls, in the places where we have been and lived. Our bodies and mentalities cannot take in these artificial objects that we possess, see, touch and smell in our everyday life. To get those non-artificial and lofty things, we have to search for either at the bottom of our hearts, or from the ancient items in which have exited for several hundred years. What can we do next? How can we change the reality of the life?

Walking through this rapid changing city, Shanghai is on the way of urbanization and modernization with non-introspecting way of the changing. What is the most marvelous moment to see the changing? Certainly it is not the scene where those so called new “designed” environment and artificial objects.

Here is the moment when you could sense the real life: the extraordinary human strength and wisdom. In Non-designed Design practice, the creations are not recorded and the works are imperfect. But the adaptability and flexibility in which those common people evolve from their harsh living environment are astonishing. These mostly no-cost materials are fully utilized in very smart and amazing ways. We try to depict such ideas by our study: the basic impulse to **optionally and partially** change the realistic world is exact the essence of design practice. The spirit of design should be originated from an experience on the real life.

For the above questions on design practice and the significance, we can be inspired reexamine the right answers by a study on Non-designed Design, which made in the non-design trained people. From their unconscious designed items, we find the genuine human creation that deal with the harsh life. Here, the significance of the behaviors and practices are more profound than those formal design practices.

In this document, the recorded samples are from Shanghai in these years, which indicate how the masses change used and reused objects for living. The various spontaneous of Non-designed Design rooted in the self-care wishes of the masses. Not only having no representatives of common interest, they are even repressed and insulted by urban administrators and nation controllers. From these creative and imaginative things in the works of Non-designed Design, we hope we could objectively present the truth by these “masterpieces” that we have seen. To think about man, life, society, nature,

and the correlation with each other in Non-designed Design, will do help us realize the practices, and appreciate their unconventional aesthetics. In such reason, an understanding to the meaning of design might become closer or properly. In the end, a new strategic design working system would be studied and worked out further.

Cases Presentation (please see the attachment of the pictures)

Captions

01 A sputum is reused as a flowerpot. 2007.07.07 North Xiangyang Rd.

Ready-found materials have been widely applied and existed in the thought of Non-designed Design. Ready-made products are worked as consumed and recycled materials. And collage is one of the best choices to present the ready-made products. The materials are re-organized in a new conception through the forced ability and the human knowledge.

02 A block is built in wasted bricks. 2006.07.08 Miyun Residential Neighborhood.

A wall can be understood as being divided into a series of unites next to each other, but not reacting to each other. It guarantees the co-existing of diversities.

03 A garden in the air, structured in a practical form. 2006.07.08 Miyun Residential Neighborhood.

Garden is a pleasant and enjoyable environment. Traditionally it is planed in a backyard. The uncertainty and illegibility of the context lead to the fundamental change of the content. The space nature is redefined.

04 A toilet paper box. 2006.07.09 Wenmiao Rd.

05 A functional frame for the mops drying. 2006.07.09 Duolun Rd, Culture Street.

06 A duty form for cleaning up the public. 2006.07.09 Wenmiao Rd.

07 A frame for clothes drying. 2006.07.09 Duolun Rd, Culture Street.

08 A free hand writing graphics for the repairing work. 2006.07.10 Lane 171, Tianshui Rd.

09 A chair made of wasted materials in a new combination. 2006.07.10 Lane 171, Tianshui Rd.

10 An advertising of bicycle repairing, made of wasted bicycle tyre. 2006.07.08

No.123 Bus, Miyun Rd Stop.

A defined object can be redefined as it is reformed or reorganized in a context of space.

11 An umbrella pavilion, fixed in a sack of rice. 2006.07.09 Duolun Rd, Culture Street.

12 The alternative cropland in a public corridor. 2006.07.09 Duolun Rd, Culture Street.

A site can be generated other content with its own particular context, moving away from being just a piece of land. The predefined function disappears when some factors are wrong, or go beyond the tolerance in either the context or the content. A site could be transformed as long as the content of function misused. It means that the meaning of object could be considered and used as an undefined function object.

13 The alternative farming land in a public corridor. 2006.07.12 Jixiang Lane 531, Middle Henan Rd.

14 The alternative farming land in a public corridor. 2006.07.12 Jixiang Lane 531, Middle Henan Rd.

15 A against regulations building. 2006.07.11 A house near Xin Tiandi area.

In the practices, the rigid and fixed structure is always ephemeral, whereas dynamic, adaptive and repeatable structure is every durable. For a certain purpose, the temporary structure attaches onto the unreliable major structure, engrafting into each other until flourishing the site.

16 A against regulations building. 2006.07.11 A house near Xin Tiandi area.

17 A used bamboo stick. 2006.07.12 Jixiang Lane 531, Middle Henan Rd.

18 A hand made post boxes. 2006.07.11 A house near Xin Tiandi area.

19 A lamp in a public kitchen. 2006.07.11 Lane 1299, Zhoujiazui Rd.

20 Locked a private tap water in a public. 2006.07.12 Jixiang Lane 531, Middle Henan Rd.

In order to prevent water from being stolen, each family has to give a lock to their respective tap. One of the most cheapest and easiest way is to use a pop can, abrading its mouth, burrowing along the jar mouth and perforating it with iron wires, covering to the top, locking through the iron wire buckle. In this way, the safety of using water for each family is guaranteed through the self-made way.

21 Locked a private tap water in a public. 2006.07.12 Lane 157, Tianshui Rd.

22 A combination of wasted chairs. 2006.07.12 Lane 157, Tianshui Rd.

23 A combination of wasted chairs. 2006.07.12 Jixiang Lane 531, Middle Henan Rd.

24 25 26 27 A method of space saving, an out of window-still is used. 2006.07.12 Lane 1200, made by Zhang Wen's father.

Interior is defined by the authorized boundary, the content determined by users, as well as the objects within. The interior is more controlled by instinct rather than self-discipline. The space functions are modularized the original boundary.

28 A stacking roof house, made of used windows. 2006.07.12 Lane 1200, Liyang Rd.

Originally roof acclaims the end of architecture at top. But here, it predicts a beginning of another construction, and another free site. In Non-designed Design, the structure is considered the practical function at the beginning. Then the energy is to be put into how to shape an ideal form. However, the ideal of Non-designed Design is usually the concocting of the advanced formal design. The form of Non-designed Design merges the either side of substance and spirit, a faked external skin with a practical core, which cares the harmony between neither different forms, nor the form and function.

29 The broken glass is used for the safety on the wall. 2006.07.12 Lane 1200, Liyang Rd.

30 The Pillows are dried on the roof, bamboo stick is used as a frame. 2006.07.12 Lane 157, Tianshui Rd.

31 The extended Balconies are used to receive sunshine, a floating land different from the enclosed interior. 2006.07.11 Lane 1299, Zhoujiazui Rd.

32 If we forget the regular conception on varied objects, a basin could be anything when it is reformed. 2006.07.11 Lane 1299, Zhoujiazui Rd.

33 The electric fan is changed to be item of whisking the flies off. 2006.07.30 Huangdu Rd (near East Jiangwan Rd).

34 A handcart made of used objects. The combination is functional and practical.

2006.07.12 Jixiang Lane (Lane 531, Middle Henan Rd).

35 In order to extend interior space, the stairs is built up in a yard. 2006.07.11 Lane 1299, Zhoujiazui Rd.

36 A suspending corridor. 2006.07.11 Lane 1299, Zhoujiazui Rd.

In Non-designed Design, the greed to grab more public space area, the expanding against each other among sites, the unexpected block at an exit, the chaotic occupancy in a corridor, and the stretching out of the illegal architecture, all of them force a crumpling path, which creates crinkled elevation, as well as intensively changing landscape along the way.

In these non-planed and designed residential areas of Shanghai, Non-designed Design is round us, and we can easily find the problems solved in different practical ways. The creators are not designers, and they even do not know basic knowledge on design, but the belief of improving life. They always try their best to resolve the difficulties without cost by exploring bravely, utilizing the wastes and applying their creation and intelligence. The reasons are due to realistic situation that “good design” costs lots money, and formal design in fact could not be intruded into their life. Although their works are mostly clumsy and simple, and the thoughts are glittering, such creative spirit is indeed approaching the essence of design and its origin.

Today, design has been being a tool or slave to stimulate users` visual and material consumption, the mission of design becomes a game of visual expression. The visual consumption does not mean only consuming the aspects of resource but hearts as well.

When design is getting involved only with designers` forms of expression, or to be the means of commercial dealings, then design is a cheat of profit for the powers, but nothing to do with the realization of humanity. The reasons are:

1. The endless of unique forms of expression in design means endless resource consumption.
2. The stylish or individual design practices do not mean could make the life happier or better.
3. The design with visual language orientation does not solve the social problems, especially for the crisis of our living environment.
4. The “good design” judged by the visual perception would encourage designers to pay attention on the considerations of surface, so that the essence of problems come to overlooked.

From the comparison with the formal “good design” and Non-designed Design practices, our realization and understanding on design therefore become clearly formed.

A Personal Perception

If I were a historian, I could find reasons and face the reality about our surroundings, by examining what have happened in our professional design fields. In the end, the time that now we have for design would become another tradition, which means it would be a part of the history as well. If I were an anthropologist, I could jump back to our real life to study the present human values of conception on material world, in order to insight the particular social reasons and related essence, with the traditional cultural spirit, value and content under the correlation in the context of the history.

Due to the correlated contrasted from a cut section of the history in an introspected gesture, I ask myself and try to search an objective word to precisely depict our social phenomena. A result comes in my mind, the valuable and meaningful things we believed should be reassessed. The assessment I make based on the feelings to the life;

by those visual artificial objects; samples of human materials and their thinking on the reality; and by the comparison with the history of previous human cultures. Beyond doubt, all the phenomena that I could see from the artificial designed objects to the peoples` consciousness, is truly the reflection of the souls, and the aspirations to living space.

I read the historical sediments of the culture yesterday; and today, I am watching the things surround me: From the changing direction of the social development to the details of mans` life; from the ways of peoples` thinking to their behaviors; from the general social value standards to the working systems of the society, I ask myself, how should I find the wisdom? Where could I reach an ideal world in my heart? Or should I have to have my ideal world buried?

Escaping?

By reviewing the world that we designed, I have finally read a mark that all human behaviors results represent human characters and instincts. The realistic world means we live in a complex life, and the life is full of different possibilities as well. As a negligible part of the procedure of human evolution, we are naturally formed in this age of the time, and laid at a certain geographic location. At the same time, we are involuntarily and baffled joined the variation of the cultural changing pattern of transmitting. The present situation of design patterns has annotated how the culture tradition evolved from one state to its opposite quality. It depicts a whole progress of the changing cycle. Now, from either internal or external contents, the beauties that people appreciated and understood for design are sorts of spurious **“surface” and “affected”** things. The meaningful and valuable aesthetic things are getting less and less.

When the value of surface presenting is regarded as a lofty and ideal beauty in design, the way of changing for the society is therefore more harmful than non-change. The belief of design practice “design makes life better” is in fact a lie. In China, an ideal cultural state is far and far away from the reality during the fast change of the development. At the same time, we have to come back to the space of the common life, just to enjoy ourselves in the games of the complex and unique social systems. Somehow, before we go to swim in the plays, we know we are already become a retarded men, but we have no place to escape.

Beyond the Vision of Design

By the realization on the cases of Non-designed Design, it helps us to think our definition on design and the meaning, as well as the affection to the change of the society. **A good design should not be assessed only by what we see, but the considerations of relationship built between human and material worlds and nature must be thought. It reminds us in which way to structure our artificial world.**

With China stepping into a process of rapid economic growth, commercial aims and profits naturally become the only measure of standard to most professions. It formed lopsided social values and mentalities. Could design face this sort of changing of the history in a new gesture, or initiatively participate the changing in the society? The answer is yes, the way of design practice need criticized.

Thousands years later, when future archaeologists and anthropologists studied the human society for our age, the way to approach the truth of design practice, they of course did not need to necessarily study the philosophy of design we had, but the samples of design objects were enough. Today, the attached danger under the fast development of human hi-techniques has started to strongly impact and overturn human values, exists and whole social systems. It is not easy to adopt us to a new social practice, when the individual and collective ideologies changed from the changing of life. The history of design itself could not tell us what we should do now for our future life. The context of the content on design is not an artificial written form, and to know the truth of

the reality for what we can trust still depending on our hearts, and the intuition of the spirits. However, the problem is that due to our beliefs have been changed and twisted, the valuable things therefore could not been seen in life. So it is not any more the matter of man, but the things we made and the things that we supplied in design practices.

If we accept and advocate with the spirit of Non-designed Design, we could reform a better or human world, and design practices could solve our social and life problems in new possibilities. In order to achieve the goal, there is two works should be formed: First, design genuinely intruded into conmen peoples` life. Second, to review our understanding on design and problems in design education, to have a new ideology intruded. Furthermore, a working system must be reformed in a practical and strategic way.

Chinese society is not another case when urbanization has been generally thought an efficient and quick mode for the economical development. When treasure becomes a common and only standard to assess ones value of life and happiness from individual to collective, by fair means or fouls to chase wealth spontaneously are fair and reasonable. The fast change of the society asked for formal design extensively in order to construct the country, but in the names of formal designs have widely produced “new items” with high recourse consumption. The design in fact becomes one of crimes to the changing of environment crisis under a “nice name” of life rebuilding. Beside the design practices have changed the scenery of the social changing, the formal design has also changed the scenery of Chinese culture context. In these changing years, people more and more believe that formal design could be a magic power to make life more beautiful and practical. The “good design” deals therefore appeared and run wild throughout the country, the material living environments are called “nice looking” forms. Obviously, the results of life are superficial and not happier.

The Value of Changing and the Value of Design

The value on changing to the world naturally formed a value on design practice. In fact, for the masses, Non-designed Design has been a fundamental philosophy and strategy of living experiments in Shanghai. In a city where established institution and market systems have never existed, and “good design” costs in a high expense, Non-designed Design is the only efficient possibility for commoner to express their creation and understanding on living environment. By both intellectual reflection and ethic solidarity, activities from different domains, or disciplines, should be regularly and systematically gathered and collaborate. Multi-disciplinary collaborations are an inevitable process open new spaces not only for more experimental design creation. Moreover, it urges the design practitioners to critically reflect at and redefine their own design activities.

Design is not a creative thing related with material worlds, it could effect our ways of life, living and the working systems. In this way, design practice can dynamically contribute its potential and power for the human society. More than being an approach for the surface changing of human world, design should design our values and thinking of living.

The reason for the problems of formal design is clear, when we do not know even about the meaning and value of life, or either the genuine meaning of design practices to human beings – these basic things, our endless and new forms of design objects or projects are of course dangerous to the human development. When GDP growing becomes governments’ main pursuing aims, and at the same time, materialism becomes what people admired, the practices of design are certainly used as the tools. This is what just happened in our current world.

What is a genuine and significant design for human? The answer seems came from what value of happiness that we chose for. We can simply divide the conception into

two choices: One choice is that we live in a high technical environment with varied advanced machines or artificial objects surrounded; another is that we live in a place with limited artificial items, we can see cherry blossom every day when we just open a window in a calm mood. The choice certainly presents our understanding and judgment for the meaning of life, means a happiness of life. As one of creatures on the earth, the second choice certainly would attract human. When we know what we chose means what design should practice.

The principle is simple, but in practice the practice of design is indeed very far away from the truth, and getting lost in a pure material consumed. The reasons are very complex in a social context, such as our social working systems, and the methods of human techniques inventions and applications. However, a root of the reason is indeed come from our consciousness and thinking.

Therefore, the basic fundamental objectives that design need intruded:

1. For the masses.

2. Ecological.

3. To guide a healthy life condition for both spiritual and material to human.

In this case, the practices of design should not work on mere in the visual perception.

Why Non-designed Design Intruded

From the realization on the practices of Non-designed Design, we could learn and review formal design in a right gesture. For example, how to have formal design introduced a methodology of inventing, which is more adaptable to the reality, more suitable to common people. By the study to the principles such as instinct, demand, handwork, low budget and context-orientation in the informal behaviors of the genuine life, formal design would not be lost in the changing the world.

For the sake of limiting natural resources wasting or consumption, a designed system for design practice seems more significant than design itself.

How can design play a proper role at the era? To have informal design intruded, Non-designed Design practice is a key to understand the shadows and problems of “good design”. The works that we should complete are:

1. To induce public discussion of the orientation on design. The main objective of this project is to evoke, in the design-field, re-evaluation and discussion on our designed-design surroundings, in order to recruit a great deal of power of design potential as major components of a rebuilding design culture. Discussion also brings about the self-examination in the current design reformation, moreover, eliminates the established language of the authorities on design.
2. To re-think design and everyday life, eliminates the grand narratives and myths in design creation and its application. It revolts against the control of authorities by actions, offering every different design activist more and better presenting opportunities.
3. To create a practical working system of design for the masses. The conception on design serves the society in China remains in a relatively low level, even though numerous art and design institutions of higher learning have already established, and contributed to making discussions and development for the public. Nevertheless, they have not yet been transformed into part of the design habits of community. As a responsible designer and sociologist, we feel obligated to contribute a variety of

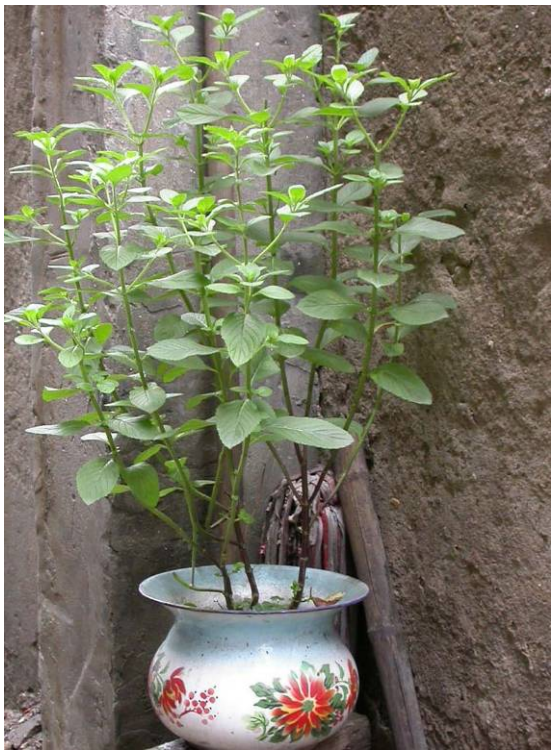
design practice, to enrich the means of design, and to change the general conception on design.

Aims

By the realization on the cases of Non-designed Design, it helps us to think our definition on design and the meaning, as well as the affection to the change of the society. **A good design should not be assessed only by what we see, but the considerations of relationship built between human and material worlds and nature must be thought. It reminds us in which way to structure our artificial world.**

The objectives for Non-designed Design Studies

1. From September 2008, we will proceed to arranging and conducting in-depth research for Non-designed Design into design education. The research results will be sorted from object, space, motivation, function, media, etc. for exhibitions, publications later.
2. The literature of Non-designed Design will be archived and studied, being a part of philosophy of design in practice for design learning.
3. A system of the working platform will be studied to have design served for the masses and developing countries. A proposal of the system will be created.
4. To create a way of thinking theory about the combination between artificial objects and nature, between human techniques application and nature in design practice, and the work will be published.



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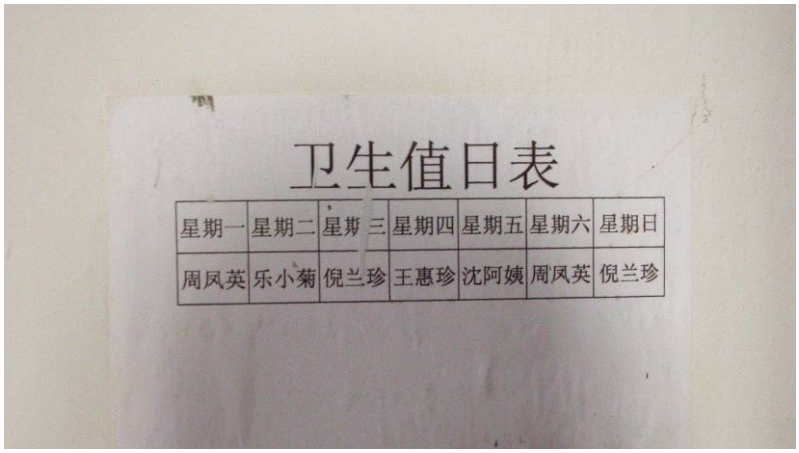

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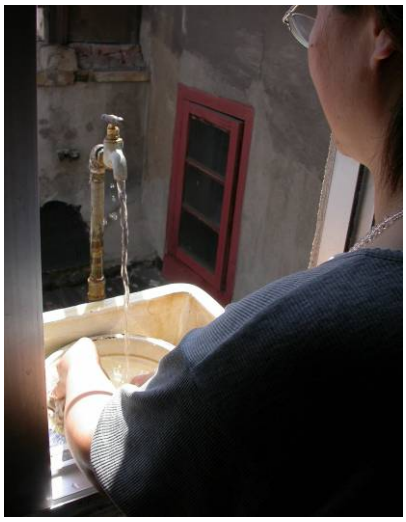

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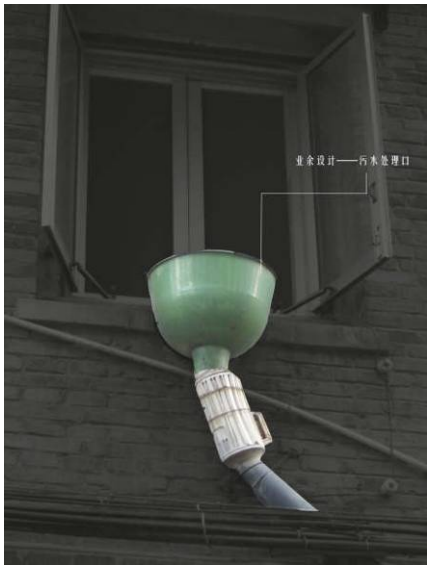

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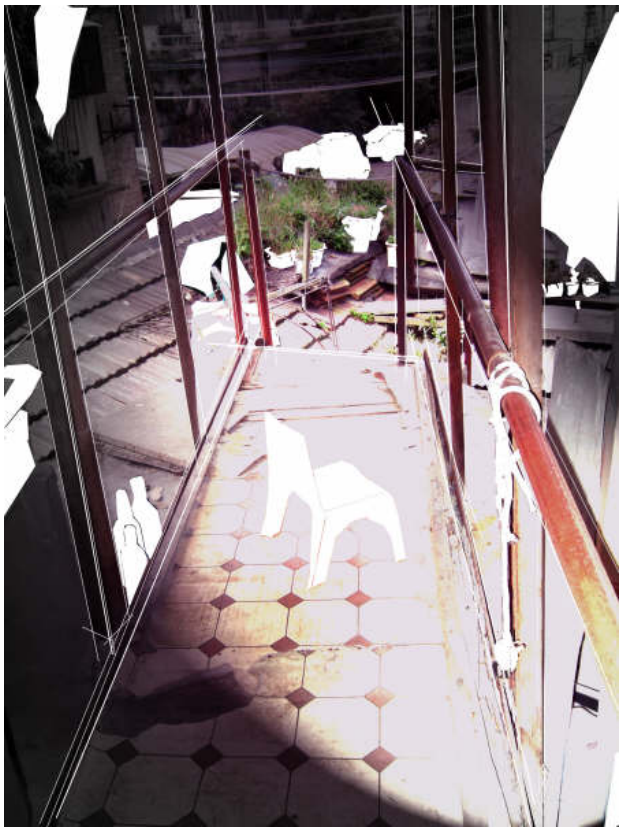

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Hybrid Ontologies

Design knowledge in a hyper-connected fluid society

Matteo Ciastellardi[1]

Abstract

All these years the proliferation of the World Wide Web and its constant growth have furthered the development of complex systems to control and manage information.

The hierarchical construction of classificatory systems has guarantee the first footsteps for a formalization of the online knowledge, notwithstanding have gone growing some popular taxonomies (folksonomy) without default relationships among the elements and without a precise point of departure.

This paper start from these shapes of widened ethnoclassification to explore which are sceneries and possibilities within design can improve on the construction of hybrid, bottom-up and collective ontologies, builded in itinere with the contribution of the users that trace definitions, associations and variations, in a kind of defective semantics, founded on the co-tagging, mash-up and syndication.

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1. Introduction

Today we live in a society with a lot of relations between people, but too much bonds and links sometimes drive to a dimension of emptiness, instead of a shape of connectivity. This emptiness depends on a wide variety of social factors, like distance from people in communication, in cultural and behavioural elements, in information management, and many others (McLuhan and Fiore 1967, 12-14). The aspects we want to consider about this issue are specially focused on togetherness and sustainability between people when they decide to engage a common path toward new systems for knowledge management in the actual hyper-connected and fluid society.

The net represents today one of the most versatile, fast and economical instruments to manage and distribute information in every fields of knowledge. The Web has been transformed evolving itself from the end of the ’80s when the only perspective was to operate as if the immense archives of the net had to be consulted like a large file, in order to arrive today when complexes software are available in order to render the fruition and the construction of the information more flexible and dynamic.

Overcoming the challenges of these years, the net has changed not only its technological infrastructures, but it has redefined completely its economical and ecological system, transforming itself in the first and more efficient communication system ever used.

The merit is due to its social dimension, which has carried people to use the web in order to replace and to integrate relationships and rituals that belong to culture of the civilizations in a “second orality” (Ong 1982, 29-35)[2] .

To create a cognitive system free of an exclusively technological-driven growth, a series of disciplines and research fields have been alternated both to promote and construct new forms of knowledge management, and to optimize those existing.

A first observation underlines how orientation abilities to surf in Internet depend on experiences of information and on evocative force of the data retrieved by users from each kind of platforms (Stamou and Kollias 2005, 22-26). For this reason the involvement of two different layers in the creation of every knowledge-path online is inevitable: we can observe a human layer, deriving from the directed ability, formation and participation of the implied users, and a technological layer, codified and formal, related to the architecture of the used systems.

In order to conciliate the two layers, multiple attempts of structuring data have been made, according to different kind of criteria, logics and models. But till now, every attempt to facilitate the knowledge management has presupposed a preorganized architecture, a preordered and filtered database on which founding the successive steps of development.

2. Semantics and ontologies for a codified knowledge

Between the multiple perspectives of innovation and development, in order to codify in a flexible way and with great effectiveness the information of the net, at least two wide perspectives (correlated but with independent variables) have been advanced from various years. These perspectives are the semantic web (Berners-Lee 2002) and the creation of ontologies (Davies et al. 2003, 58); both these aspects have allowed to reach specific results in the field of knowledge management and in its indispensable declinations.

[2] Walter Ong highlights the passage happened from civilization at first orality (that knows only oral and phonetic forms to sharing knowledge) to civilization at secondary orality (that have also writing forms in order to communicate).

The semantic web represents a proposal that since the dawn of the net, for the merit of Tim Berners-Lee, has taken consistence, becoming then debatable and partially operating only in specific environments. The ontologies instead, that brings their name from philosophy, still today constitute one of the few framework codified for the management of the information.

Properly such structure would have to be reconsidered in order to mature a vision opened towards a future rich of elements based on a hyper-connected and fluid society: greater possibilities for interconnection between people, high speed of feedback on the actions and choices of the users and, above all, bottom-up[3] management for the data classification, granted by communities that complete an automatic selection and a cultural analysis of the information which they manipulate and with which they come in contact.

The semantic web, moving from evaluation dynamics of information like those indicated, becomes an environment in which all the present and traceable information (pages, files, images, links…) can be associated to specified metadata[4] able to individualize the context and to construct a network of multi-pertinence for each information.

Instead the ontologies are the structures able to maintain in perfect hierarchical relation all the entities found (Nirenburg and Raskin 2004, 353-8) and opportunely "tagged"[5], supplying also an exhaustive and rigorous conceptual schema with which manage specific relations, rules, dependencies, symmetries and differences. An ontology[6] is a descriptive, classificatory form, realized to open and delineate the schemes in which information will be incorporated and rearticulated.

Between the most widespread ontologies is possible to remember Cyc, a system already developed in 1985 that consists in a constitutive ontology and in various specific ontologies for each domain of pertinence; WordNet, a database designed like a semantic network and based upon psycolinguistic principles; SUMO (Suggested Upper Merged Ontology), a project of constitutive ontology that reserve some terms and their meaning for all the systems based on the same standard (P1600.1) in the same way in which a general ontology (in philosophical sense) defines "what exists", implying that a hierarchy can be accepted rather than a chosen base.

If it has been the hierarchical construction of such systems to guarantee the first steps for a formalization of the knowledge in the net, we can't forget that different modalities of information management are growing: they are popular taxonomies (folksonomies[7]) without predefined relations between the elements, and without a precise structure of departure. These taxonomies

[3] The word "*bottom-up*" indicates a model of production and construction of the knowledge "*from the low*", from the people; in a bottom-up construction the objectives and the organization of the contents are established from the same members of the community. This dimension is set against the "*top-down*" processes, in which the roles of the users are determined from an external authority and circumscribed from specific software mechanisms.

[4] Metadata are literally data about data, of any sort in any kind of media. Metadata are used to facilitate the understanding, characteristics, use and management of information; they are required for effective data management varies with the type of data and context of use. Each item of metadata could describe an individual element, or content item, or a collection of informational objects including multiple content items. See Baca, Murtha. 2000. *Introduction to Metadata: Pathways to Digital Information*, Los Angeles: Getty Trust Publications.

[5] A "tag" is literally a detailed label that can be attributed to a any element in order to characterize it: a tag describe the items and enable keyword-based classification and search of information. Tags are usually chosen informally and personally by item author/creator or by its consumer/viewers/community; they are typically used for resources such as computer files, web pages, digital images, and internet bookmarks, and for this reason, "tagging" has become associated with the Web 2.0.

[6] In philosophy the term ontology (lit. "study around the nature of being") represents the study on existence and forms the basic subject matter of metaphysics. In computer science and information science, an ontology is a representation of a set of concepts within a domain and the relationships between those concepts. It is used to create the domain scheme and its properties. See Taniar, David and Johanna W.Rahayu. 2006. *Web Semantics and Ontology*, London: Idea Group Publishing.

[7] The word folksonomy derive from the fusion of words folk (people) and taxonomy, and indicates a collaborative, popular modality (bottom-up) to classify the information in collective and collaborative ways (collaborative tagging, social classification, social indexing, social tagging). This method is a bottom-up perspective to apply tags to annotate and categorize content. See Tapscott, Don and Anthony D. Williams. 2007. *Wikinomics: La collaborazione di massa che sta cambiando il mondo*, Milano: ETAS.

have concurred to develop some spontaneous and collaborative forms of classification “bottom-up”, in a position to reflecting the conceptual model of the same users.

3. The defective semantics: unstable bonds and open ontologies

Starting from the definition of an innovation that based its effectiveness on the capability to foresee behaviours and on the dimension of user adaptation (semantic web), gradually begins a change of perspective that redefines the concept of knowledge management for as it has been constructed and for as it still comes formalized when it’s necessary to distribute information online.

The systemic hierarchies of information today begin to transform themselves into folksonomies, starting from a bottom-up perspective of common collaboration (Tapscot and Williams 2007, 41), to define and classify by tags different kind of data.

This perspective has started from a communication necessity and not from the matter of knowledge, in order to take advantage of the more suitable prostheses, of the more versatile instruments and of the more simpler technologies, just to define with these instruments what can enter in the grid of the shareable knowledge.

If we want to trace which are the consequences, or the forerunners of this phenomenon, we have to formulate some basic consideration regarding the scenario transition of the recent years:

- The people are “inside” the information and not only “in front”.
- The information do not have a relationship of pure fruition and distribution with users, but they have become active parts of the process of knowledge construction.
- Not only the messages (the contents) have been “tagged”, but also the objects (the media) that deliver contents, and all the entity involved in every process of information.
- The hierarchical schemas and the univocal classifications can’t describe any kind of scenarios in constant changing.

Considering these points the user becomes not only a passive receiver of data but an active propeller of the information in the net, exiting from every hierarchy and relational tie.

The information become a moment of proliferation of indefinite groups (Lévy 1996, 122), that aggregate and separate themselves according to complex and not measurable phases. The ties that are constructed among statement, terms, concepts and cluster of data born and die in the same time in which the attention of collectives focalize them, rearticulating the capacity, the content and the same labels (tags) that can classify it. Unstable links between the informations are developed, as a result of the “bottom-up tagging”, that is deriving from how online community accept and determine the attributable values.

The outcome of all these processes is a form of semantics that is declined on the attractions and the polarity of the involved users, and that rearticulates the same network, because no hierarchical structure can control a process that does not coincide with its own schemes of demarcation and classification.

We run into a sort of imperfect semantics, articulated on hybrid ontologies, in which no more models of heuristic and linguistic can be found, but it’s simple to discover processes of tag mash-up[8] and syndication[9], that characterize the collective mass actions, projective and unforeseeable, of the communities in the net.

[8] The term mash-up indicates a combination of data from more than one source into a single integrated tool (or environment). Mash-up adopts a more fundamental approach to content aggregation without regard to markup: individual content may be combined in any manner, resulting in arbitrarily structured hybrid content. The term could also be used

4. Changing perspective: from semantic web to hybrid ontologies

The passage that must happen is from “learned” ontologies, founded on information hierarchies, and flexible paradigms, within the limits of specific knowledge domains.

The change of perspective is founded properly on the imperfect nature of these links: to work these links must be founded constantly on the fluidity that a hierarchical system cannot guarantee; they must base their structure on the constantly in-definition shape of the social systems that share the information and rearticulate it into the web.

This way the knowledge management constructs itself on the connective dimension of users’ thought (De Kerckhove 1999, 16), still before on their presumable “collective intelligence” (Lévy 1996, 19), and it defines a kind of open-ontology form, in continuous alteration and semantically imperfect, that is without possibility of a linguistic or structural definition, because it’s impossible to determine when and where the knowledge domains could finish and how many (and which) entities could be involved before transforming all the environment in something completely different (Taniar and Rahayu 2006, 84-88).

The point of convergence between the connectedness of the information, and the social dimension of the net’s users, offers a perspective on how the knowledge is still organizing itself in the web dimension: which instruments, which challenges and which drivers are characterizing it and which forms of technology are growing in order to reach specific results on the various application fields.

As Nova Spivack[10] suggests, the actual net scenario is not characterized by the decline of the semantic web, but by perspectives still to pursue and to reach (figure 1).

as mesh-up, as it happens in some cases, in its meaning of “connection”, but it is preferable to use the most diffuse “mash-up” for the common sense it had assumed in the web.

[9] The word syndication indicate a way to made available a section of a website for other sites or applications. A syndication is based on web feed: a data format used for providing users with frequently updated content.

[10] Nova Spivack is one of the pioneers of the Web, one of the first businessman who creates a company related to Internet. Spivack currently is considered one of the maximum expert on the future technologies and evolution of Internet. For more information visit http://novaspivack.typepad.com.

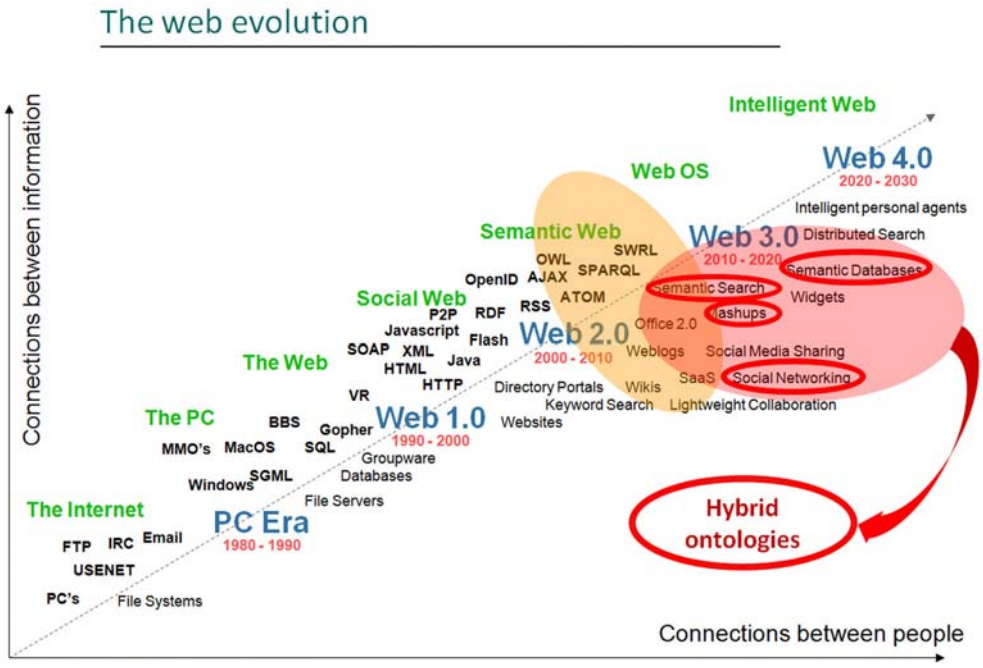

Fig. 1: The intelligence is in the connections, Radar Networks & Nova Spivack, 2007

The point of arrival is very difficult to localize, specially trying to following to realist path of implementation and development. But here is the challenge for design: finding a way to manage and organize the next steps of the online knowledge system, starting both from a point of view of conceptual planning and from technical implementation.

This way could coincide with the alignment of the actual hyerarchical structures with the bottom-up perspective of data classification, making changeable and classificable the same categories and relations used in traditional ontologies. This permits to arrive to an hybrid ontology, based on preconceived structure, but self-organizing and self-articulating in its constitutive schemes, constructing its recombinant structure on what online communities outline, vary, forget and reconstruct.

5. The design challenge in the web knowledge management

The user is a multi-dimensional figure in the world of the web. With the advent of the online communities, with specific software for social tagging and social bookmarking (Technorati, Del.icio.us, Flickr, Facebook…) and with wiki-like systems, the topography of the net has begun to model itself in a more realistic way, comply to the dispositions of the users whom classify and filter the information.

The translation of this classification resides, for example, in the tag-cloud[11] phenomenon: aggregates of terms with different font-size dimension that indicate the "popularity" of some words rather than others (some examples are present in figure 2).

[11] A tag cloud is a visual weighted list of user-generated tags used typically to describe the content of a website. Each relevant topic is represented by a tag, which is shown with different font size or color.

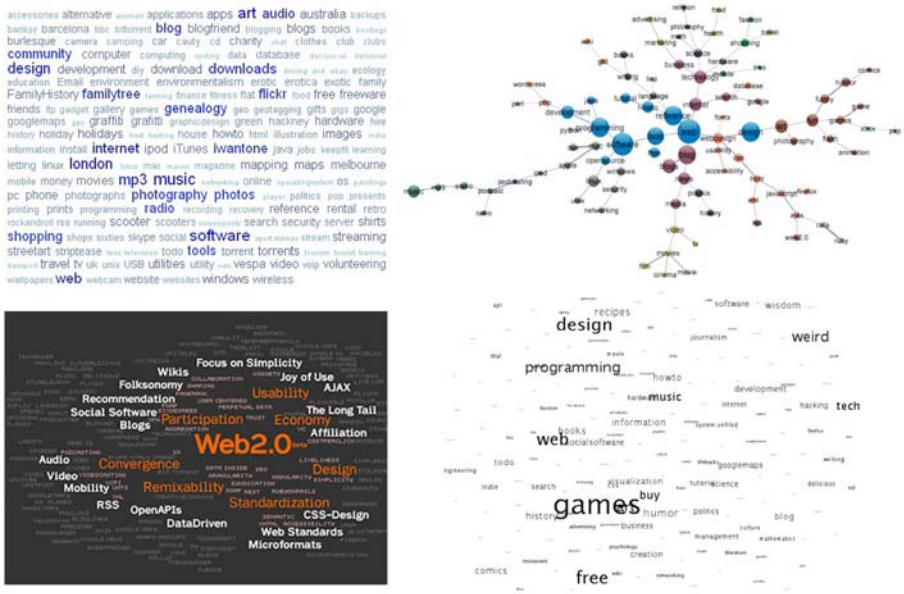

Fig. 2: Some examples of different online tag-clouds

The tag-cloud permits, just at first sight, to draft a scheme of what is relevant inside a specific informative domain. If in this system we embed the semantic dimension that characterize the users' choices, and we embed also a system to manage the flow of information traced, we can propose a new dimension for the online knowledge management. It's obviously indispensable that the bottom-up modification of the hierarchical structures is allowed to accord the emerging classification forms.

Such perspective creates the vision of a scenario in which hybrid ontologies, related to specific or general domains (and therefore developed based on narrow or broad folksonomy[12]) articulate the shapes of the knowledge that the same users determine and classify.

It's possible to criticize the system retrieval scientificity and the approximation of the data management processes (D'Alessandro 2002, 46-49), but a system based upon hybrid and bottom-up ontologies does not risk to become less scientific or less reliable than others that have only predefined rules in order to determine thresholds of quality information. It is instead a benefit relying on a system that avoid to leave in evidence only the result that already are in evidence: for example the most common crawlers offer a list of resources ordered by relevance criteria, and users usually choose between the first series of results, enhancing this relevance. This situation, such a closed circle, does not allow some significant changes until communities themselves start focusing on specific information which will gradually obtain preeminent visibility into the classification hierarchy.

The role of design emerges in this dimension of management and development of new strategies to codify knowledge. Particularly design has to become the interpreter of all the disciplines involved in the change of the web paradigm: sociology, philosophy, computer science, linguistic, semiotic and so on...

This role does not want to be a position to sew together distant activities: the first change which must be operated in the communication paradigm arises from the vision of a different role

[12] A broad folksonomy is defined as a lot of people are involved and describing same objects; a narrow folksonomy is about a small group of users tag particular items.

of the user, who is not a passive figure, but is the particle of a uniform and fluid mass which synthetizes schemes and produces variables and labels for the information to classify.

The goal is therefore to find a point of synthesis between the vision of a scenario where the information can rearticulate itself bottom-up, contaminating the whole system (redistributing itself and remapping its own schemes in every interrogation), and a framework of the information which is starting now to grant users the right role for the social-collaborative turning point they have made.

The design has the possibility to establish a rhetoric of the project in order to create a dialogue between the social and the technical tissue, and this means not only to produce a toolkit to support new scenarios with sustainable models, but also to suggest a vision of a different cultural apparatus, to offer a new way of online interaction, and a new points of access to the knowledge.

The real challenge is how to translate a common overview based on connected platforms, social systems and information in a framework of actions. A first answer is the creation of a different system to approach and retrieve information. This way proceeding the design role is to offer users the possibility to define and share different environments of knowledge. The modality could be the implementation of learning interfaces (example in figure 3) that are able to interconnect data, analyzing the browsing habits and the tagging classification of the users, and entrusting the new shape of knowledge management on:

- the consideration of three interconnected units: user, information and tag/labels;
- a modality to self-organize each information in a “hybrid” ontology;
- the dimension of the cooperative tagging: mash-up of the tags and self-classification (bottom-up) and deconstruction of the semantic links.

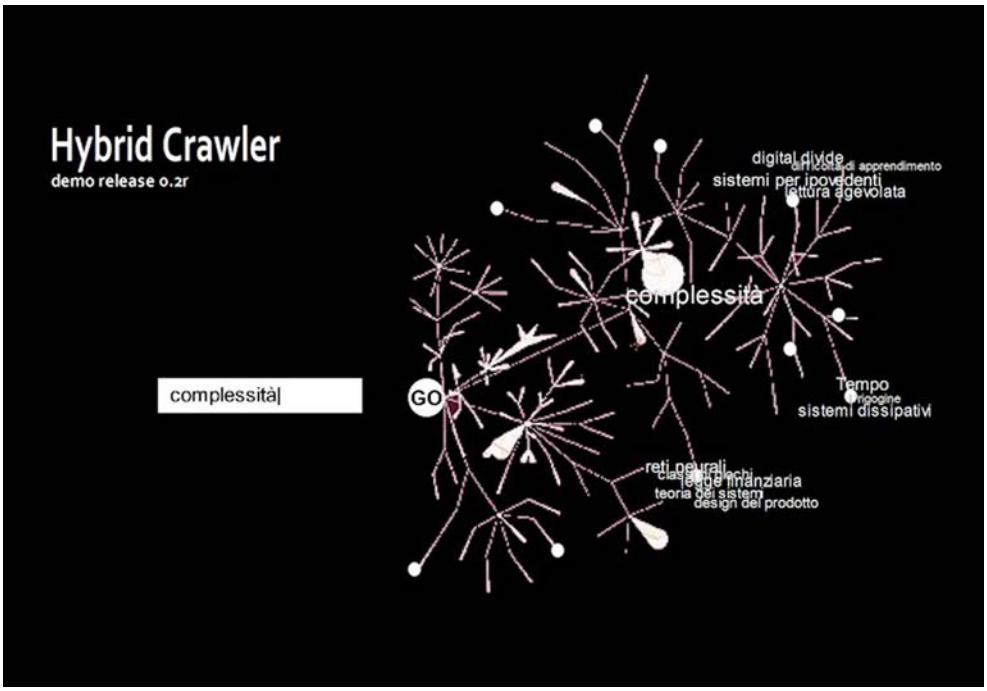

Fig. 3: A prototype of interface design for hybrid ontology: a simple bottom-up crawler for narrow folksonomies

Without enter in the merit of specific tools that design could try to develop, the hypothesis remains to plan the possible scenarios, to find out the focal points on which continue the research, without loosing the obtained progresses, and accepting the challenge to deconstruct the designing rules in order to create new project drivers, deriving from the contamination with a new system to build the knowledge.

6. A conclusion? A beginning

In conclusion the vision of a new sustainability for our hyper-connected and fluid society is based upon a common and collective approach to manage and develop knowledge, and actually could be realized with a new… beginning, in the sense of a redefinition of the constructs and modalities to articulate the knowledge in the web. Perhaps, if this vision can scare for its too much ambitious change of paradigm, it is important to mind that paradigms change without people notice something: only after the change we can discover the differences. Like italian novelist Italo Calvino suggests «we will be able to pass beside phenomena never seen without realizing anything, because our eyes and our minds are used to choose and catalogue only things just tested and classified» so, the real issue about changing the information, changing the approach to knowledge and, for instance, changing the change is: «if a new world would be discovered now, could we see it?» (Calvino 1994, 131)

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

HANDLING CHANGES THROUGH DIAGRAMS.

Scale and Grain in the Visual Representation of Complex System.

Paolo Ciuccarelli[1], Donato Ricci[2], Francesca Valsecchi[3]

Abstract

To change towards a more sustainable development could means to make decisions not only with a systemic approach, but also to be able to decide in the right time: the density. It seems that, when the discipline of Design integrate a systemic approach with the competences of designers in visualization, it can cope with dense situations, providing effective artefacts – diagrams – to improve the decision process and making profit from the richness of complexity. The prior findings of the Complexity Science are here assumed as a theoretical framework to have an interpretative model on how the knowledge about systems could be organized and depicted. Three tools to produce effective diagrams, framing, graining and scaling are here discussed though six case studies.

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1. Introduction

Among the different approaches for sustainability and sustainable development, a common belief seems to arise: the economic, environmental and social dimensions are strongly interlinked. It is necessary to deal with them as a whole (Meppem 2000). This observation, endorsed by the major institutions committed in sustainability development policies (ie. WCED), finds a more general correspondence in the assumption that the world could be seen as networked and as a complex system (Capra 1996; Castells 1996). Over the past forty years complexity theory has become a broad field of study appreciated in a variety of ways and illustrated in books and papers among the others by Nicolis and Prigogine (1989), Anderson, Arrow, and Pines (1988), Jantsch (1980), Holland (1975), Gray and Rizzo (1973), where, older epistemological classifications and domains of expertise have become more permeable (Klein 2004). The increasing regard in system thinking and science of complexity showed - in different ways and times - by economic, environmental and social disciplines (Parker and Stacey 1994; Stacey 2000), and, more germane to our field of study, by planning in social systems (Byrne 1998) and decision-making, seem to reinforce the link between sustainability and Complexity.

Byrne (1998) argues that the disclosure of systemic approaches lies in the coherent integration of action and the understanding of phenomena, transcending the limits of analytical traditional modeling techniques. Even if a well-defined “toolbox” for sustainable changes based on the findings of system thinking and complexity science, has not yet been found, there is enough convergence on two pillars that can be used to shape new tools:

- **The need for trans-disciplinary sustainable development approach** based on a systemic perspective. This statement is supported by the relation established between trans-disciplinary and complexity (Max-Neef 2005);
- **The interpretation of sustainable development as a learning process.** Discussing the integration of the science of complexity, knowledge management and organizational learning disciplines, McElroy (2000) states that “complex systems are, by any other definition, learning organizations”, and adds, on the other side, that “knowledge is the product of natural innovation schemes inherent to all living systems”. If sustainable development means to drive change and to make it happening in complex systems, it has to take part to the learning processes underpinning complex systems behaviors.

It can be argued that sustainable changes need methodologies and tools able to support a learning process in a complex system with a trans-disciplinary approach. Moreover, this learning process should be collective (Manzini, Vezzoli, 1998). Holman says (2007): *“Effective, sustainable change are sessions in which people collectively explore each other’s assumptions, seek and expand common ground, shape a desired future, and jointly take ownership of the solutions to the issues at hand”*. Furthermore, Clark (1995) argues that traditional development models relating expert knowledge to social need with a top-down approach are increasingly unable to cope with the demands of a complex world.

Another point should be considered: time. In the past, changes happened slowly, in different regions at different times. Since 2001, in the “State of the World”, Gardner underlines the global scale and the speed of current changes, emphasizing the need to handle them responsibly and rapidly in order to keep the track of sustainability. The time issue is crucial. Quick reactions and decisions are asked, where, mostly local changes risk to be dampened out if communicated too quickly to the whole system (Prigogine). To stress the importance of time and complexity towards a sustainable perspective, we use the term *density*: density could be seen as the ratio between time and the amount of data, information and knowledge (interests, point of views…) to be considered in the decision processes that aims to a change. Again, Gardner underlines that, the dramatically fast pace of changes prevent societies from understanding the consequences of

their activities, also because the options for development, in a complex, networked system, have increased in number and complexity.

Considering the time constraints, handling changes in a sustainable perspective entails coping with a dense situation, or rather dealing with the complexity of a collaborative learning process that involves all the stakeholders. In the next pages, why and how design should be a discipline integrated in the changing process, in planning and decision-making, will be discussed.

2. Complexity Science and Design discipline

One of the most important challenges of complexity science researchers is to facilitate connections among knowledge domains apparently distinct and separated towards themselves, approaching system to be known in a systemic way. This basic idea is confirmed by Gell-Mann (1995), he describes a way about carrying on this approach: *"[...] some efforts just getting under way to carry out such a crude study of world problems, including all the relevant aspects, [...]. The object of the study is [...] to identify among the multiple possible future paths for the human race and the rest of the biosphere any reasonably probable ones that could lead to greater sustainability".* This, which seems to be more a challenge than an actual reality, has to recall disciplines by their own nature situated at the edge of different competences domains. Design discipline is one them. There is a need for integrating competencies, labelled by Gell-Mann as *"a crude look at the whole"*.

In this sense, the hypothesis that design may join those disciplines of *"looking at whole"* outlining a designer profile whose task is to select results from heterogeneous disciplinary fields activating a trans-disciplinary circulation of concepts (Pizzocaro 2000), is made. This means adopting and developing a new attitude based on a theoretical framework that overlaps systems science and complexity theory (Findeli 2001). Designers should use their skills to facilitate the emergence of the system; they should no longer focus on finding solutions to specific problems but on the ability to develop tools that can be self-adaptive, continuously modifiable and improvable (Scagnetti et al. 2007). It has been argued (Friedman 2003; Manzini 2004) that Design has gone through multiple phenomenons that have reshaped its meaning and its nature. Designing within Complexity, in fact, involves both substantive and contextual challenges, from the increasingly ambiguous boundaries between artefact, structure and process to the increasingly large-scale social, economic and industrial frames. This could be seen as the need to cope with a Complex environment in which many projects or products cross the boundaries of different organisations, stakeholder, producer, and user groups. Acting within complexity requires considering the impossibility to reach an exhaustive knowledge of the system in which one operates. It could be passed by developing a strategic stance that allows facing the system changes and evolution. Designer's key competences: **see**, **show**, **fore-see** (Zurlo 2007) could become also key instrument to define strategic changes in a system. More in details the skill of **showing** could be perceived as the detection and description of all the agents involved and of their relationship. It could be seen, also as the opportunity to visualize complex information referring not solely to the communication of quantitative information but also of intangible values and qualitative data.

3. Communication Design and social Complexity

We assume that design interventions could produce changes and transformations both in organizations that start them and in the complex systems in which they are performed. It is possible to state that evolution in organizations, here seen as social complex systems, and complex systems detract themselves from analytic logic rules and could not be leaded with simple actions (Lewin 1999; Lewin, Teresa Parker, and Regine 1998; Olson and Eoyang 2001). Stacey (2000) says that in complex environments the management task is coping with and even using unpredictability, dissents and inconsistency. The tasks of all managers are to deal with

instability, irregularity, difference and disorder. We can suggest that coping with unpredictability is a priority even for Design activities. This new approach leads to start questioning (Kurtz and Snowden 2003) the universality of three basic assumptions that had inspired for long time organizational and planning theories:

- **Assumption of order** – cause and effects in the human behaviour are linear;
- **Assumption of rational choice** – humans facing diverse alternatives will make a "rational" decision maximizing or minimizing some values;
- **Assumption of intentional capability** – the acquisition of a capability implies the use of the capability.

Even if in some contexts these assumptions could be true, new arising situations seem to countervail them, leading to guess that new tools and modes for managing complexity in human systems are required. Even though Complexity Sciences provides new paradigm for mathematical and computational system modelling, it could be also seen as a new approach to the human world. The comprehension of some of complex system structural features (Cilliers 1998) could be useful to outline new modes to act in planning, decision-making, strategy and design. A complex system, is dynamic, involves large number of non-linear interacting agents constrained with the environment. Furthermore, one the most important feature is the unpredictability of the system due to its sensitivity to external conditions. Based on the enlightened features a considerable amount of research projects have been carried on mainly using agent-based modelling to simulate phenomena and evolution of complex systems (Camazine et al. 2001; Weiss 1999), but there are at least three important issues limiting computational modelling application (Kurtz and Snowden 2003; Snowden and Boone 2007):

- **Identity** – humans bend and deform their identity both individually and collectively;
- **Rules** – nevertheless collective agreements and individual acts are under certain pressure or rules, the matter of intentionality plays a primary role in social complexity patterns (Juarrero 2002);
- **Local patterns** – the high capacity of interacting on large scale throughout abstract concepts on one hand, and, on the other hand, by using technological infrastructures is becoming more and more evident.

This does not mean detracting value to simulation in handling social issues but the use of simulations rather than being used as predictive tools, should be used as supportive ones.

Another force differentiating social complex systems from the complex ones could be identified by the fragmentation one and is directly linked to the identity issue. Fragmentation refers to the inhomogeneity (Chapman 2003; Stewart 2001) between social network actors (stakeholders, controllers, influencers, project teams and organizations) involved in system evolution, making effective communication very difficult. Social complexity requires new processes and tools fundamentally attuned to the social and conversational nature of decision making and design work. In this framework a new perspective seems to appear: to enable a more and more valuable interaction level and dialogue among the actors of a social system. It could be useful to shape linguistic tools and competences furthering changes rather than predicting and leading them. Focusing this new perspective on that side of Design discipline dealing with languages, the Communication Design could face the creation of visual languages affording representations of Complex systems, easing the spotting of awkward, creating shared visions within multi-actor contexts. The challenge lays on the use of communication artefacts utilized for the definition of common objectives in a project to create pivots so as to work in a resourceful manner. To act in such kind of domains, increasing the interaction and communication level becomes a fundamental action in order to manage and handle changes.

Diagramming and mapping, typical communication design artefacts, could facilitate to face the proposed challenge (Abrams and Hall 2006). Diagrams as devices for shared strategies and

evaluation of projects impact have an enormous potential to improve decision making processes thanks to their ability to involve all the actors, overcoming the possible hurdles created by specialized knowledge and languages. This definition of diagram includes all those artefacts (maps, scenarios, charts, storyboards, etc.) featured by a revealing capacity, a diagrammatic attitude finalized to the act of design (Scagnetti et al. 2007). Diagrams from this viewpoint could help designer to shape clearly complex problems, they are media between what is known about a system, and what it is; they could display not only quantitative data but also ideas, concepts, frames, schemes, viewpoints, perspectives and values of the system observer.

To sum up, extending and dropping some theoretical speculation about diagram reflections developed in architecture field of study (van Berkel and Bos 1998), four diagrams characteristics (Corbellini 2007), could be enlightened:

- **Condensation –** diagrams and the realm of tangible designed world, are related by their capacity to cope with the elaboration of huge amount of data and variables;
- **Bridging** – diagram could express relation between polychrome information often non homogeneous, suggesting unexpected description of phenomena;
- **Proliferation –** diagrams as dialogue enabler could generate diverse ways of thinking about problems being faced, becoming, also, story-telling devices;
- **An- exactitude -** The creation of a diagram is a partial and never exhaustive description of the environment. It is a narration in which inevitably a choice of what will be represented is made: it is a political stance, intentionally structured and thus arbitrary.

This feature shows the principle of responsibility designers should be aware of.

4. Designing diagram to design

In order to produce effective diagrams some preliminary operations have to be performed about information gathering and transformation. To design diagrams, information and data must be collected from different disciplines, with the aim of collecting not only an extensive knowledge about a Complex System, but also to synthesize its regularity (or irregularity) (Scagnetti et al. 2007) in a goal-oriented way, producing new knowledge about the system in which intervene.

Beyond diagrams differences in visualization and information management modes, they seem to be comparable in the way they treat information, or, to be more exact, in the way they allow us to treat information. This common feature might be an interesting approach for an effective modality to design them and to study how they are related to the described system. Assuming information as a key element to start visualizing complexity, it could be also seen as a parameter to "measure[4] complexity". An interesting way to quantify complexity is the *length* of a *message* to describe a certain feature of a system. It referring to a description could be nothing but a subjective property. Complexity, however defined, is not entirely an intrinsic property of the described entity; it also depends to some extent on whom or what is doing the description. The observer and the system are in a relationship. As a more general definition (Bar-Yam 1997) we could present that an observer is a social complex system, which through interactions retains a representation of another system (the observed system) within itself (Pizzocaro 2004). Obviously

4 The number of ways of measuring complexity has grown fast. This multiplication of measures has been taken by some to indicate confusion in the field of complex systems. In fact, the many measures of complexity represent variations on a few underlying themes. Here is an list of measures groups:

1. Difficulty of description.
2. Difficulty of creation.
3. Degree of organization:
   a) Effective Complexity. Difficulty of describing organizational structure, whether corporate, chemical, cellular, etc.
   b) Mutual Information. Amount of information shared between the parts of a system as the result of this organizational structure.

necessary condition to adopt this measure is to adopt a language intelligible to the actors involved in the representation of the complex system. Gell-Mann (1995), introducing this concept, says: "*The length of the shortest message that will describe a system [...] employing language, knowledge, and understanding that parties share".* This leads us to the consequence that defining complexity request to define and share, among other parameters, the thickness and extension adopted in describing the system. Furthermore, considering diagrams as picture shaping representation of complex systems, in order to design them it is required to provide conceptual and operative tools able to care and share these parameters. Using these tools increase designer consciousness in his condensation operations.

In this framework, we have defined project team and at the same time multi-actors organization, involved in handling changes in complex system, as the observer of the same system. Obviously, multi-actors organisations are here assumed as social complex system. The presented tools, which will be discussed throughout the paper are to be considered as a deepening of previous presented results during the international conference IASDR07. They refer to the first two steps: *analysing* e *representing*, belonging to a wider a methodology (Scagnetti et al. 2007).

The aim of this paper is defining three fundamental tools in generating diagrams, which define their features:

- **Framing** – the definition of the complex system extension domain being enquired and in which intervene;
- **Graining** – the definition of the threshold accuracy and deepness of the information whole, helpful to describe the system;
- **Scaling** – the definition of the viewpoint on the represented domain and related visualization.

The first two tools address knowledge objectives, whilst the third one dealt with communicative goals.

4.1. Framing.

The representation of a Complex system presents several difficulties arising from its structural features. In order to achieve an interpretative model on how the knowledge about systems could be organized and depicted is appropriate to define a key concept: Complex systems are usually open and interact with the environment they live in. This concept implies that it is difficult to clearly define the *space* where information should be gathered; therefore, it could be useful to define how *wide* the description will be, subsequently the system visualization, creating a *frame*. In design interventions *frames* are needed to narrow the number of information to make the system manageable and describable. It is important to notate it is more helpful to use the term *frame* rather than the word *boundary*. Boundary recalls a piece of land within a fixed limit, a frontier, and originally referred to the word *bound* meaning limits imposed or under obligation, and consequently could suggest something that inhibits actions. It has been argued that (Kurtz and Snowden 2003): *"the boundaries we consider are more like phase changes than physical boundaries (though they could be physical boundaries, if those boundaries coincide with phase changes)"*

On the base of this assumption, even if the space where a complex social system acts could be identified on a geographical or territorial base, a more faded term is required: *frame* could be this term. The etymology of the word frame[5] comes from the Greek KORONIS "something blended or curved" (Pianigiani 1990), so a process of framing could be described as a process of looking where the things start changing or blending in an environment that is obviously seamless.

5 We refer to the Italian term cornice.

A good framing action might be based on the system behaviour perception. In other words it answers to the question: **Where do we expect starting patterns of interactions change?**

Any frame is identified by who is attempting to describe the system for a particular purpose and therefore affected by biases, interests and vision. Cilliers (1998) explains this concept through the interrelation of the framing process to the position of the observer of the system. Moreover, framing is to be related to the temporal dimension of the system, not only they evolve through time, but past events are co-responsible of present behaviour. Ignoring the time dimension could produce inaccurate representations, synchronic snapshot of diachronic processes. Such kind of action is a very delicate one. There is a need to communicate and share how the framing process has been performed in order to discuss and to create consensus among all the actors involved in a specific design process. The action of framing ensures the system is defined in both relevant and manageable way, working on the domain extension field is wanted to be known.

4.2. Graining

In order to manage the description of the system, what information accuracy will be considered, have to be also decided. To set a resolution level, defining the systems structure, could be useful to arrange a process of *graining*. To *grain* information is a fundamental action considering the amount of sensible data much greater than the available, perceptible and intelligible one. Even if we assume the possibility of obtaining all the information about a complex system it will be almost impossible to use it, since it creates a situation of *information overload*[6]. Furthermore, analysing a complex system implies the acquisition also of noisy and incomplete data. Their huge amount, its noisiness and incompleteness if associated to a lack of selected and monitored data, constraints the system describer to a cumbersome filtering and sieving procedure.

The building of tools able to effectively parse data is required. Graining is the properly tool for doing that. It operates by making approximations, by ignoring details on finer scales, creating *grained observation* of the system at a resolution that shows the overall pattern of the system and the pattern of the elements in it. It is a crucial process for highlighting the *regularities* immersed in the observed system[7]. Adopting graining as conceptual tool, however able to transform the way we look and act in complex systems, it is possible to set two end points of a continuum where the various way where grained observations could fit in. On one hand are *fine-grained observations*, a near sighted way to perceive rendering detailed impressions, on the other hand *coarse-grained observation*, a far sighted observation rendering rough impressions. In other terms, if we make a coarse observation, the system describer can consider only large cluster of agents in the systems (i.e. institutions) obviously a lot of smaller detail will get lost in this process. On the contrary, a fine system examining, in *microscopic* details, the system observer has to keep track of each agent and of all patterns. Looking for regularities could be obscured *"by the buzzing activity at lower level"*[8] (Cilliers 1998).

Grain is a quite complicated concept, and requires more than a metaphor to clearly depict how it works. In addition, another example could be given (Gell-Mann 1995): envisioning taking a whole picture of a complex system in order to spot on a very small detail, the observer should zoom a lot the picture. Reaching a certain level he will only see the single grain of the picture film

6 The term was used by Toffler in 1970 and is often used to describe the simple notion of receiving too much information. It has led to various synonyms and related terms as for example cognitive overload, sensory overload , communication overload, knowledge overload, or information fatigue syndrome.

7 It is useful to remind that Complexity science mostly asks: What causes order and regularities? (Mainzer 1996).

8 A useful example is given by Chris Stephens: consider the number of degrees of freedom of the atoms composing a solid object (like a pen). This is enormous (≈ 1022). However, in order to describe the motion of a solid object, we just need 6 degrees of freedom. We have then a very much reduced "coarse-grained" description in terms of many fewer variables. So, we need to understand how more appropriate effective degrees of freedom, such as the translational and rotational ones of the rigid body, emerge and offer a more appropriate description of the dynamics. Of course, the coarse-grained description is not exact. How the resultant loss in precision affects the description depends on what one wants to know about the system.

and instead of distinguish the desired object, he will only perceive a group of stains. From this example follows that grain is a sort of *threshold* operator acting on the data gathering deepness. The process of graining narrows the amount of data should be managed by a representation, and then by a diagram. This means valuing the complexity of a system based on its description is function only of its resolution: the grain.

From a philosophical point of view should be asked that graining introduces an element of subjectivity into the theory. Furthermore, could be objected that the grain threshold is not decided upon unambiguous and rational choices but rather by the describer. As a general rule *common* sense should be used to distinguish between observable and unobservable quantities, manageable and unmanageable. As the coarse graining is subjective, so measurements are inherently subjective operations (Bais and Farmer 2007). Graining helps in addressing the following question: **At what deepness is it expected to find regularities or irregularities?**

Even if the term *grain* finds its roots in the photographic vocabulary and the Complexity Science uses it to explain some of its operations, in this framework it has to be considered as an effective parameter to be shared in reaching a common representation of the analysed space. Operatively, grain threshold process should be performed both on agents and on data about them. Information on complex system should be distinguished in flows (i.e. tangibles: goods or money; intangibles: information) and environmental ones (proximity, closeness, influence).

4.3. Notes on the adoption of framing and graining tools

The main idea is that the representation of a complex system is necessarily linked to the purpose of the representation itself and the disclosure of the purpose is a necessary condition of the same process. In other words one of the capabilities of complex system is to be able to acquire, compare, and store information concerning the environment for future use. Furthermore this process is related to the *meaning* conferred to the data and information in order to produce knowledge of the studied system. Meaning in this term could be seen as the result of a *dialectical* process. The aim and the meaning have to be made explicit in order to achieve a successful representation, and consequently a good visualization. The framing action as well the grain threshold level should be tuned on the purpose and the questioning wills about the system in which intervenes, avoiding senseless and uneconomical processes. For instance to trace an economic system is useless to know all about the movements of every penny or Euros even if all the economic system is a pattern of movements of penny or Euros clusters. The *cost* to trace every agents, data, information or relationship is higher than the profit it could generate, the cost should be seen here as a function of two main parameters:

- time and resources for data gathering;
- time and capacity for data processing.

In other words it is a function of the *density*.

A shared use, among design team, of framing, graining tools is necessary to avoid some difficulties of representation processes (Burkhard 2004; 2005):

- **Information overload** – Actors cannot identify the relevant information;
- **Information misinterpretation** – Actors cannot understand, evaluate and interpret the information;
- **Information misuse** – Actors cannot use or misuse the information.

Involving actors since early phases of representation and then visualizations helps to go over the different backgrounds (different ways to understand and interpret visualizations), and provide relevant information for design interventions.

Even if the two processes of framing and graining are not reversible, and exclude a part of the system to be understood and represented it has been stated that “harnessing complexity involves acting sensibly without fully knowing how the world works” (Axelrod and Cohen 1999). But design is a discipline that for its own nature has to cope with (Buchanan 1992; Cross 2001) open, ill-defined or wicked-problems (Conklin 2003; Rittel and Webber 1973), that happen in complex social systems. Moreover, what the system is depends on what is asked about it: different stakeholders have different views about what the system is and what constitutes an acceptable way to intervene in it – the problem. Since open problems have no stopping rule ending when “good enough” solution is reached (Simon 1996), it is also useful to say that even the framing action and the graining process could end only when it is found a good enough resolution satisfying all the actors involved in the system representation or in the design intervention.

4.4. Scaling

Operative instructions able to visualize phenomena could be mutated from a cartographic approach. Among the various tools provided by cartographic repertory, scale is a very useful tool in managing also visualization of Complex Systems. It chooses the *scene* and the viewpoint to be visualized. The scaling process does not affect the representation of the system, information gathered will be still available even thou they will not be depicted: like a movie-camera, trough the scale level setting only a part of a known reality is shown.

Far from being only a zoom of the map, it represents a fundamental step to depict information. The setting of the scale level consists in an operation that aligns the distance from the observed systems to the communicative goals pursued, as determined by the observer cognitive and perceptive capacity. Scale do not provide parameter to define how have to be know a system, instead it define how a system will be communicated; scale does not require an object to be know but a several object to be depicted.

Cartographic scale is becoming “visualization” scale (Montello 2001). The concept of scale is often confusing, even in the cartographic field of study having multiple referents:

- **Cartographic scale** – the object depicted size relative to its actual size in the world;
- **Analysis scale** – the size at which some problem is analysed[9];
- **Phenomena scale** – the size at object or processes exist, regardless of how they are studied or represented.

Although the three meanings are interrelated[10], we mostly refer to the first meaning. Scale setting level have enormous consequence for the degree to which information is generalized. Generalization refers to the amount of details included in a visual representation, in this term scale imply processes of simplification, selection and enhancement of some particularly interesting features in order to accomplish a communicative goal (Lam and Quattrochi 1992). It is useful to remarks that choosing appropriate scale level, again, can only be decided in empirical way. Starting by the same complex system, scale allows to explore in details system elements, or to read the overall characteristics on the base of communicative needs.

9 Analysis scale present some analogies with the graining tools, in fact terms such as resolution or granularity are often used as synonyms for analysis scale.

10 Choosing the map scale depends both on the scale at which measurement are made and on the scale at which an object of interest exists.

5. Case Studies

An empirical verification about the use and the application of the proposed tools has been performed in a didactic laboratory, the *Density Design Lab*[11]. Established in September 2004, the lab has been conceived as a platform for verifying the potential of communication artefacts in helping decision making. The course lasts six months, and usually forty students compose the class. Students are introduced to the concept of diagrams to support decision making processes. They generally work in groups of 6/8 members. To each group is assigned a system to work with and to verify the effective complexity. The whole group manage the data collection as well as the problem setting phase, under the supervision of an external advisor[12]. We choose topic coherently to students interests trying to explore relevant socio-political issues. In the last edition students explored:

- the Italian cinematographic system;
- the fashion system;
- the contemporary art system;
- the hospital - patient system;
- the Italian transportation infrastructure system;
- the Italian media landscape system.

The excepted output of the analysis and representation phase is a diagram able to identify some possible evolutions of the system student coping with, and a communication strategy to *activate* the evolution, the whole design experience is reported on the blog[13]. Even if we try to afford a fully understanding of the system and a relevant data gathering, the laboratory cannot provide a real decision making process albeit the decision table is simulate and the real actors often involved.

5.1. Frame setting discussion

All the six studied system were represented by real data, only the hospital system was represented abstracting it, creating an ideal model. In this case the framing has been set to the physical bound of the ideal hospital. Framing seems to be reasonably well defined, attuned to the purpose of the system description, namely to understand the relationship between the hospital structure and the patient emotions. In general, framing process has been determined by spatial limits: national extension for cinematographic, media and infrastructure ones, international framing for the fashion system.

Some consideration emerged about not appropriate framing choose: in cinematographic systems, the frame should be extended not only to the production chain (producers, distribution and directors of film) but considering hidden actors also, like political influence and religious interferences. It has to be admitted, the difficulty to grasp such kind of information hindered the possibility to consider, and then visualize, relevant connections within system. So the framing resulted too tight considering the initial cognitive objective: to discover how the financing process in the system is performed.

Contemporary art system suffered a similar situation: referring the representation only to the Italian territory without considering the international echo connected to their scope, it was almost impossible to pursue the intent to trace contemporary art market dynamic.

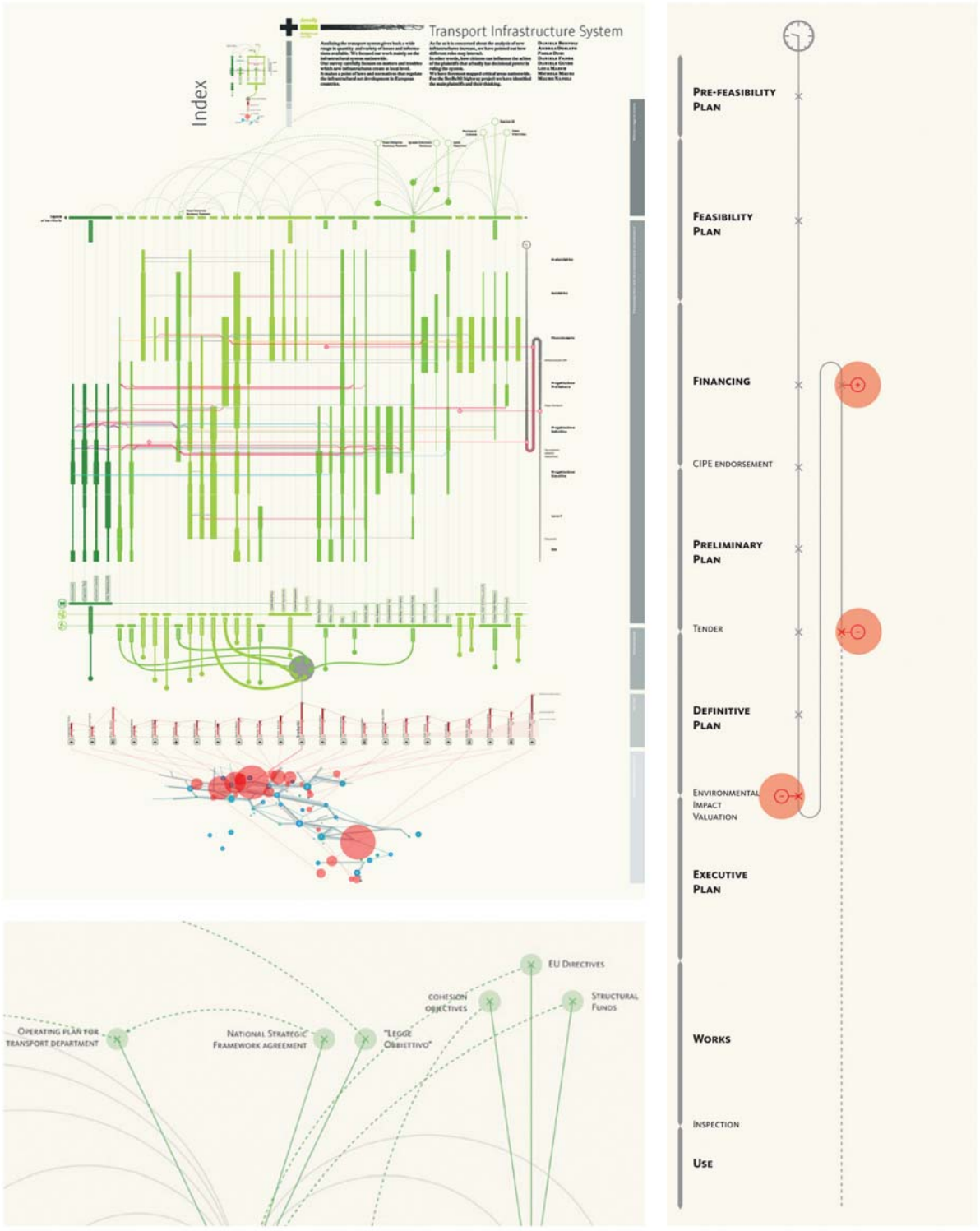
11 Density Design Lab is a research and experimental laboratory, born as a laboratory course in the final year of the Master Degree Course in Communication Design at the Politecnico di Milano.
12 The advisor is an expert of the system to be known and his task is to advise the group supporting them in the system exploration.
13 A fully detailed (pics, images, stories, knowledge base) description and explorations of the project is available at <http://densitydesign.org>

The fashion system case introduced time variable into framing process, limiting the representation to the last 5 years, which can be consider a relevant period in the fashion system evolution.

In the infrastructure system the frame seems to be well defined, focusing on the Italian controversies which new infrastructures planning and implementation create at local level. Students considered also the correlation between European laws and normative regulating the infrastructural network development.

	Purpose	**Framing**	**Graining**	**Scale**
Italian cinematographic system	Are the financings managed or influenced by subjects whose individual affairs are in conflict with the role that they dress again inside the system?	National extension, only focussed on production chain	Fine: single director and movie	Not provided
Fashion system	Do fashion capitals still make sense? Moreover are there new actors on the international scene?	Worldwide, 5 years	Coarse but “deformed”	Not provided
Contemporary art system	Which are the relations between influencers and the valorisation mechanism?	National extension	Medium	Not provided
Hospital system	Which is the relationship between the hospital structure and the patient emotions	Physical bound of the hospital	Very coarse: groups, hierarchies, protocols of the structure	Attuned to the communicative goals.
Italian media landscape	Are users reached only by few editorial groups? Is the same content provided in different ways giving a wrong idea of pluralism?	National extension	Fine: Editorial products	Not provided
Italian transportation infrastructure system	Which is the dynamic leading to controversies developing new infrastructures?	National extension, EU extension for laws and normative	Medium: Groups and institution, impact, % of project progress, cost	Some cluster of information were been depicted much in details than needed

Tab. 1 Resume of the system representation and visualization purpose and frame, grain setting parameters



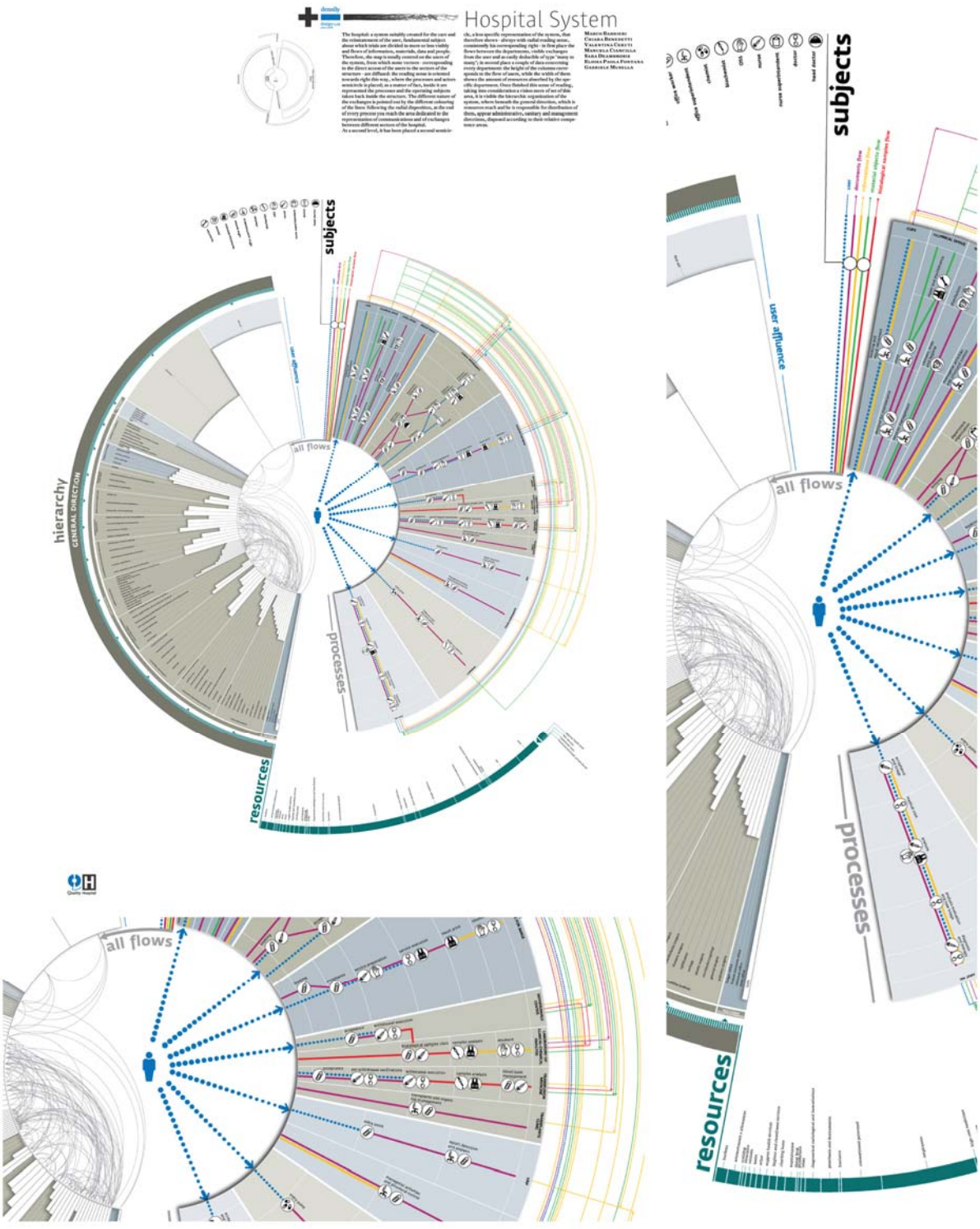
Img. 1. The Italian transportation infrastructure system diagram and some close up

5.2. Grain setting discussion

Not attuned to the purpose frames, easily affect graining process too, as it happened in the case of cinematographic system. Focusing on the production chain, fine grained filter has been applied detailing all the single film and director. The result is a huge quantity of single data not related each other; a coarser graining description of the system, investigating aggregations instead of single elements could better give sense to the influences affecting the production chain.

The approach to graining process has been different: sometimes very coarse (hospital system), sometime fine (contemporary art system). In other cases a middle level has been chosen: in infrastructure system grain, as in the fashion one, referring only to institutional agents and aggregate data. It has to be said, in the fashion system, due to unavailability of data the graining level has been “deformed”. Infrastructure system group sets the grain threshold starting by associations and local groups to ministries, departments and govern. Furthermore, in order to have a controllable parameter they selected data about infrastructure project on the base of project impact accounting the number of people involved, percentage of project progress and cost.

Often the relationship between framing and graining is very close as the case of the hospital system. The need to understand how an hospital works and which is the role of the patient, as stated in the investigation hypothesis, a very coarse level of grain has been required: representation concerned only the dynamics between different hierarchies and protocols of the structure. A finer graining level would have compromised the disclosure of the purpose, to understand the general mechanism of the hospital, and to trace every single individual agents would have masked the overall dynamic of the system.



Img. 2. The hospital system diagram and some close up

5.3. Scale setting discussion

In the six complex systems analysed the difficulties in choosing the degree of generalization of information, related to a specific communication goal, has been also faced.

It could be observed a general bias to visualize the system as it was known, too much details, not aligning the distance from the observed systems to the communicative goals pursued. Is the case of cinematographic system in which is not provided any kind of scaling, so the diagram do not shows the overall characteristics of the system itself. Instead, in the case of Hospital, scaling was coherently applied, and aligned. The diagram of the system describes the structure as well as the dynamics of the relations among the various agents constituting it. Furthermore to underline some of information has not been aggregate to clearly shown some of the analysis phase findings.

In the case of Transportation system in which framing and graining were well defined, some cluster of information were been depicted much in details than needed.

6. Conclusion

The tools described in this paper suggest paying a special attention to improve designer awareness in the use of diagrams; their use is proposed providing a theoretical framework. To sum up: the tools requires those who have to cope with complex issues to understand what is the purpose of system representation as well to stimulate a shared vision of it even through the use of framing, graining and scaling processes.

The framework proposed has been refined trough 4 years of didactic activities, leading to some limits, both logistic and related to the availability of only secondary resources. Thereby in the case studies, the use of time as a framing parameter has been affected by the lack of a real decision- making table and it has not been properly explored.

Overall, the experiments enlightened the effectiveness of the proposed tools, providing the students whit clear reference to approach complex systems. The processes proposed, negotiated with the teaching body and the experts, and emphasized the need of a recursive definition in order to share it. It has to be admitted that in some case the expected data availability affected too much the use of the tools, influencing both the effectiveness and the awareness in their use, they are the case in which parameters seems to be not tuned to the purpose of system enquiry.

The next step of this ongoing research would be a testing phase extended also to non academic contexts[14].

Some difficulties have to be noticed in the communication of the parameters setting to external actors to whom visualization have been presented, but in general term the diagrams effectiveness as facilitation tool has been well valued. Furthermore, it could be useful to design proper system to label visualization, developing new kind of legend. Information about how the framing, graining and scaling process have been performed, should be taken into account in this new kind of notation, in order to provide a clear explanation to all those who have to *work* with diagrams to help changes happen.

14 The tools and the processes here described will be adopted, in the Summer schools Workshop in the framework of Turin World Design Capital 2008. Further detail are available here:
<http://www.torinoworlddesigncapital.it/portale/en/content_2.php?sezioneID=288&ID=437&categoriaID=382>

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

How you define is how you design

Problematitic definitions in Design for Sustainability Education

Stephen Clune[1]

Abstract

This paper proposes that problematic definitions of sustainability, contribute to problematic Designs for Sustainability (DfS). Understandings of 'unsustainability' are embodied in realised design outcomes, or 'How you Define is How you Design'.

The proposal is explored through results of a three year action research project at the University of Western Sydney. The project aimed at improving the ability of undergraduate design students to Design for Sustainability. This was achieved by theoretical and pedagogical interventions within the sustainable design curricula to A. increase students understanding of unsustainability and B. assist in transforming this understanding into Designs for Sustainability.

Such interventions are required if we wish to influence the practice of our future generation of designers.

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1. Introduction

This paper proposes that problematic definitions of sustainability, contribute to problematic Designs for Sustainability (DfS). Understandings of ‘unsustainability’ are embodied in realised design outcomes, or ‘How you Define is How you Design’.

The proposal draws on results from a three year action research study at the University of Western Sydney where theoretical and pedagogical interventions were implemented in the Sustainable Design curricula. The interventions attempted to A. increase students understanding of unsustainability, and B. transform the understanding of unsustainability into realised conceptual design solutions. This paper explores the process of how progressive DfS theories are transformed into conceptual design solutions in undergraduate industrial design education.

This paper is structured to provide a background to the framework of ‘How you Define is How you Design’ by a brief reading of the history of Ecodesign, illustrating that a poor understanding of unsustainability is embodied in design solutions and strategies. This is followed by a more appropriate definition of unsustainability. The methodology for the three year action research project at the University of Western Sydney is outlined, introducing the sample for the project in students participating in the sustainable design stream of the undergraduate bachelor Design / Industrial Design program. The theoretical and pedagogical interventions made in the sustainable design curricular in 2006 and 2007 are outlined. Finally the impact of these interventions is discussed in relation to students’ improved designs for sustainability, which were achieved through a more appropriate understanding of unsustainability.

2. Background

The historical reading of the progression of Ecodesign to Design for Sustainability also marks a progression in definitions of unsustainability. The framework of ‘How you Define is How you Design’ is used to explore this history of Ecodesign illustrating how definitions of unsustainability and design strategies are closely aligned.

The early focus of EcoDesign framed pollution as the problem, therefore cleaner production was the solution; waste was the problem therefore recycling was the solution; resource exploitation the problem, therefore LCA and design for efficiency (EcoDesign) were deemed solutions. These initial strategies represent a ’technical‘ school of thought behind which are the dominant forms of DfS engaged with to date by industry. The concern is that the dominant forms of DfS practice are based upon a narrow, non-relational and ill-defined notion of unsustainability.

A progression to more refined definitions of unsustainability offering a ’social‘ orientation for designers has been attempted, for example; Product Based Wellbeing was the problem therefore a service society via Product Service Systems is the solution. This marks a progression from the end of pipe solutions (waste and pollutions) to the front of pipe in acknowledging consumption. Schmidt-Bleek’s (1999) MIPS (material Intensity per unit of Service) presents a strategy that defines inefficient material consumption matched with poor service life as the problem, therefore more efficient material consumption and better service life are the solutions (MIPS).

Tischner’s progressive abstraction in defining problems can be applied to unsustainability as the definitions have progressively moved deeper and deeper to what would be the root causes of unsustainability (cited in Lewis and Gertsakis 2001). Moving from treating the symptoms of unsustainability to treating the cause introduces progressive theorists such as Manzini and Shove. Manzini defines unsustainability in social terms through a lack of commons and contemplative time, therefore he posits Design Orientated Scenarios that bring people together and the creation of contemplative time as possible solutions (2003). Finally Shove's work can be appropriated to define the problem of unsustainability in terms of Consumption, Cleanliness and Convenience in acknowledging inconspicuous consumption and the ontology of design as the problem, of which

to date there has been limited design response in interpreting the complex definition of unsustainability and transforming understanding into DfS outcomes. The hypothesis that a more informed definition of unsustainability will lead to more appropriate DfS is presented within this paper. The above overview of DfS strategies also marks a progression in the understanding of unsustainability.

Unfortunately the problem of poorly defined understanding of unsustainability is not isolated to industrial practice. Ramirez' (2006, 2007) studies of both Australian and International institutions teaching industrial design highlighted that the type of DfS taught is dominated by a technical approach focusing upon end of pipe strategies such as recycling and disposal. Educators defined 'sustainability as being identical with ecological design or green design, which focuses mostly on minimization of environmental impacts and usually not covering aspects of promoting equity' 2007 p3. This is problematic for Industrial Design education and indicates that an intervention is required to shift the understanding of unsustainability to a more holistic approach. Design education in the form outlined above may be contributing to broader problem of inadequately designing for sustainability.

The author's definition of unsustainability identifies embodied and inconspicuous consumption in our everyday worlds as the major contributor to the ecological crisis.

Drawing on discourse of embodied energy and ecological-rucksacks, embodied *consumption* shifts the focus to the demand side and refers to the energy, water and natural resources embodied within the products and services used within our everyday practices, a type of consumption which goes largely unnoticed by the consumer and thus leads to a 'disconnect' between the results these resources afford and the resources themselves. The concern of embodied consumption is best described by Frascara's observation of consumerist culture that 'ready-made products appear like magic' (1996 p 45). Lenzen illustrates that within Australia 48% of Co2 consumption occurs through goods and services purchased for the house (1998). The end-user only sees the tip of the iceberg in relation to what they actually consume.

Inconspicuous consumption refers to the inconspicuous (unnoticeable, unobtrusive, unostentatious) normality of our consuming (Shove 2003). Our default habitual daily behaviours consume a great amount of resources. Embodied consumption shows us only the tip of the iceberg in what we consume (the embodied consumption is hidden), where by inconspicuous consumption highlights that a large percentage of our consumption goes unnoticed as it is habitual, which suggests that the iceberg may not even be seen. Tonkinwise highlights that it is the 'throughput' of materials in the house are the core contributor to an unsustainable rate and scale of resource consumption (2005) and Manzini highlight that it is within the boring and mundane everyday where the drivers of consumption occur (2003).

Elizabeth Shove (2003) is influential in providing insight to inconspicuous consumption of the everyday; Shove presents our unsustainability by asserting that the normality of our everyday life is driven by comfort, cleanliness and convenience. Thermal 'comfort' has seen a shift from personal heating which most civilization developed as a means to maintain comfort of the individual through clothing, to space heating in the warming of a larger environment (home, workplace, car and shops) to maintain comfort. *'C*leanliness' identifies how shifts in bathing and laundering habits have occured, for example a major shift in practice has occurred from the weekly shower to the twice daily shower with obvious resource implications in water usage. Finally 'convenience' and social efficiency allowed products to be a dominant focus within the house; products designed to create or manage time dominate the aisles of our shopping centres i.e. 'fridges, freezers, vacuums, microwaves, recorders and packaged food all share the premise of convenience. Shove provides insight into the normality of the everyday practices that have contributed to the unsustainable behaviours of the present. Shove's perspective on inconspicuous consumption is critical to defining why we are unsustainable. In order to design for sustainability an understanding that acknowledges the drivers behind inconspicuous consumption is required, Tony Fry's philosophy of Defuturing does just that.

Tony Fry philosophy of Defuturing provides a process for understanding the drivers of unsustainability and strategically targeting interventions that may contribute to sustainability. Fry's philosophy suggests that our present is a construct of the past, therefore the future will be a construct of the present. Through deconstructing our past and why we are unsustainable, a road map to sustainability can be developed (1999). The philosophy is heavily drawn upon in encouraging students to create a holistic perspective on unsustainability prior to offering DfS solutions.

This paper illustrates how the University of Western Sydney has engaged in the shortcomings outlined above through an Action Research project over three years. The project developed interventions aimed at engaging industrial design students with A. a deep understanding of the drivers of unsustainability to form an appropriate definition and B. to transform the definitions into conceptual design scenarios.

3. Methodology

Action research was used to integrate the interventions through the three year project. Stenhouse (1975), Carr and Kemmis (1983) proposed the 'teacher as researcher' as a viable profession to contribute to knowledge, however Kemmis notes that today the 'teacher as researcher' has limited application due to national curricula and reduced teacher responsibility (Carr and Kemmis 2005). It is believed that Industrial Design education is still afforded this original position as industrial design is not governed by a national curriculum (like nursing and education) therefore the recommendations made have a direct route to impact within the curriculum of the design disciplines.

The project examined over 500 conceptual DfS scenarios which were the outcomes of student assessment tasks at the end of the compulsory sustainable design stream. The second year industrial design students had completed the formal sustainability stream therefore the results are indicative of their understanding of unsustainability at the particular time, the proposal 'how you define is how you design' forms the premise for this assessment. The assessment tasks were 'conceptual design scenarios' illustrating sustainable solutions to thematic areas i.e. water, transport and energy. The structure of the unit is modeled on Tony Fry's Defuturing in that 'the present is a construct of the past, therefore the future will be a construct of the present'. The unit offers three distinct periods in the past, present and the future. The past is explored by a tutorial exercise where by students identify why we are unsustainable and how design has contributed to this. The framework of Shove's Comfort, Cleanliness and Convenience (2003) is used to illustrate how inconspicuous consumption is attributable to design. The nucleus of the 'how you define' unsustainability is formed through this task. The present is explored through contemporary trends research where current trends are extrapolated for their potential impact on a sustainable future. The future scenarios are constructed in a series of day long intensive workshops utilizing a hybrid model of scenario planning (Lopes, Clune et al. 2007). Finally Designers respond to the scenarios with 'conceptual design scenarios' to contribute to a sustainable society.

Using content analysis the 'conceptual design scenarios' were examined against categories represented within the progressive DfS theory. The categories for analysis included the sustainable 'school of thought' that was represented by the design scenarios, be that 'technical', 'social' or 'socio-technical'. Brezet's (1997) four types of innovations in 'product improvement' offering incremental improvements to existing products, 'product redesigns' to existing products to offer resource saving, 'functional innovation' where by the function of the products is questioned and met in alternative ways and 'systems innovation', where systemic changes are offered as the solution. The potential resource reduction was also measured through a quick MIPS (Material Intensity per Service of Use) calculation which located the degree of resource reduction that the design's offered.

Content analysis was used to internally validate the results across the interventions that were made in the years ending 2005, 2006 and 2007. The interventions were both theoretical and

pedagogical, and focused on both sides of the framework ‘How you define is how you design’, to better our definition of sustainability ‘how you define’ by increasing students understanding of unsustainability, and second to transform the understanding into realised conceptual design solutions ‘how you design’.

4. 2005 Pilot; troublesome definitions of unsustainability

2005 was a pilot year for the study and highlighted that the students’ conceptual design scenarios struggled with two key elements; first the radical scale of achieving Factor 10 reductions and second, the proposed agency of design to effect change outside of technical product design. The problem lied in defining both ‘unsustainability’ and ‘what Industrial Design is’.

The majority of conceptual design scenarios offered designs with incremental ‘product improvements’. In relation to resource targets established such as factor ten and factor twenty only a fraction more than ten percent of solutions reduce resources greater than factor ten, with over sixty percent of solutions offering only incremental improvements. While resource reduction is not the only criterion, the designs did not engage with the social or social technical school of thought, which the author hypothesizes as contributing to low scale of resource reduction. The understanding of design’s agency to influence behaviours or to operate at a level outside of the product was largely absent. The problem in defining is not only located in defining unsustainability but in defining the scope of industrial design, viewing industrial Design as a purely product orientated occupation. This, it was hypothesized, severely curtailed students’ ability to contextualize design’s agency within society.

The road go-cart (see figure 1.) is a typical example of a student’s response to transport. The solution is purely focused on the car as the problem. The solution that is presented is more fuel efficient and uses less materials, and is well refined with regard to technical detail. However throughout the process the demand side of transport was never questioned. The complex social drivers underlying the need for the car are not acknowledged in how the student has defined the unsustainable problem to respond to,

The intervention planned for the following year focused on two areas; first to increase students understanding of unsustainability with regards to the scale of resource reduction required in relation to the demand-side drivers of unsustainability and design’s agency. And second the process for transforming the understanding of unsustainability into design solutions was developed.

A series of lectures, debates and tutorial discussion were implemented. The lectures quantifying the ‘scale of reduction’ were given explaining the underlying rationale for targets such as factor 20. Formal debates within class were held, for example ‘is the Tesla Roadster is an effective transport solution for Sydney?’ The opposing sides were briefed with alternative information, one pro evolving car technology one pro public transport, walking and biking. The examples of Curitiba's public transport system and the grand Lyon Velib bike share were pitted against the electric Tesla. The debate explored the limitation of electric cars to reduce congestion and more widespread issues of city planning, exposing the limitations of the technical solutions and the opportunity represented by public transport, walking and biking to contribute in a greater way to the transport mix. Tutorial discussions on Ezio Manzini’s criterion for the sustainable Everyday projects in light of the student’s project were also conducted. The criteria of ‘low material and energy intensity’ was easily understood, however the criteria to ’integrate and share’ and ‘bring people closer’ (Manzini, 2002, p.10) appeared to be an abstract criteria for students and a dimension of sustainability that has previously not been considered.

Particular attention was paid to the transformation of nascent understandings of unsustainability into design solutions. While it was identified by the researcher that the student design in 2005 were not representative of sound definitions of unsustainability, it was difficult to locate if the problem was simply a poor understanding of unsustainability, or that the designer’s lacked the skills to transform the broad definition of unsustainability into resolved design solutions To transform the understanding of unsustainability into design solutions, several mechanisms

were put in place which included articulating the polar opposite of sustainability, transforming the understanding into a brief for sustainability and applying creativity tools to the brief to refine DfS.

First the definitions of unsustainability were articulated, templates were developed to articulate why we are unsustainable. For example our transport is unsustainable because of A. dependency on oil, B. dependency on transport including conventional modes of satisfying this dependency At this stage, students were encouraged to address the root cause, to move beyond the obvious issues of cars being the problem to the underlying causes i.e. Urban sprawl and divided work and home locations. The polar opposite of unsustainability is then articulated to formulate criterion for sustainability. The criterion for sustainability is then transferred into a human-centered design brief. Once the design brief is identified the hypothesis is that students are now working with the familiar tools of design, just a slightly altered brief. The abstract notion of sustainability has been transferred into a straightforward design problem. The focus presented from the design brief allows creativity tools to be applied. Creativity tools require a well defined problem to enable them to succeed (Osborne 1963, Shneiderman and Fischer 2005) which the design brief affords. Even if students are adverse to sustainability all that is required is the appropriate application of design skills from this point forward.

> To assist ***your persona*** complete the daily activity of ***picking up the kids from school*** within the quadrant comprising of ***Urban Sprawl/Home Ownership*****,** whilst satisfying the design criteria of: A. low material intensity (less material removed from nature therefore having a smaller environmental impact); B low energy use in any form - electricity, fuels (solutions must be highly efficient across the life of the product); C. high regenerative potential (enhancing and if possible regenerating environmental and social resources); D. providing a positive experience in that completing the activities is fulfilling and E. ***reducing car dependency.***

A suite of creativity tools are then applied to design briefs in intensive day long workshops. Previously in 2005 the problems lacked focus; while we encouraged students to generate multiple solutions, when it came to the selection of solutions the lack of criteria curtailed students ability to make decisions.

The creativity tools drawn upon by staff included Osborne's checklist, morphological analysis and think back exercises. Morphological analysis charts are developed with students to expand the number of possible solutions they have to pursue. One creativity tool developed that proved successful is the 'Think Back' exercise (Lopes, Clune et al. 2007) which supports Fry's philosophy of defuturing. Students are asked to 'Think Back' to a time in history when society addressed its needs without electricity, air-conditioners; prepared food without fridges or coordinated social events without mobile phones? The exercise is successful as it forces students to acknowledge that there have been alternative practices in place in the past and that there is a great opportunity to draw on and re-invent such practices in the present.

5. 2006; Pedagogic interventions

The results of the first intervention saw an improvement in the student's conceptual design scenarios. The percentage of designs that addressed a higher level of resources reduction greater than factor 10 had increased by 12%, and there were 19% fewer designs that were classified as incremental improvements. The results were also encouraged by designs drawing upon higher types of 'functional' and 'systems' innovation.

The results indicate that positive ground had been made with regards to students' understanding of the problem of unsustainability. The solutions had addressed sustainability at a deeper level. Figure 2 'A suite of solutions to reduce demand for commuting' is typical of the design solutions presented in 2006. The solution progressed to the demand-side of transport, attempting to resolve the issue via reducing demand as opposed to making vehicle more efficient. Available technology was drawn upon to create a scenario that would significantly reduce the demand to commute for work and study. The solution is successful when judged against the metrics used in the study. The alternate criteria for sustainability, combined with a well thought

through design brief assisted to create alternate ‘conceptual design scenarios’ which supported the notion that ‘how you define is how you design’.

While progress had been made in student ability to design for deeper levels of sustainability, primarily through the generation of sustainability criteria and design briefs, Industrial design’s contribution to the process appeared to be poorly understood. The concern of the author was that the process developed had facilitated design responses that forced students to design solutions representative of the criteria, which was formed on a slightly more progressive understanding of unsustainability. The learning that occurred through the process was however, shallow. Students completed the process and generated concepts; however they had not located the solutions within the context of everyday life.

The apparent shallow understanding led the author from focusing on *what* to teach to focusing on *how* to teach, and the pedagogy used in education for Sustainability was engaged with. Multiple sources converged upon deep learning as the appropriate pedagogic approach to best facilitate Education for Sustainability (Ben 1999, Warburton 2003). The key to deep learning is on moving the delivery of the unit from being teacher-centered to student-centered.

Deep learning is closely aligned to the constructive approach to knowledge, in that the teacher cannot hand out know ledge; knowledge is created through the learner via the transformation of personal experience (Dewey 1963, Kolb 1984). Learning by doing to create understanding is closely associated with deep learning, while surface learning refers to more temporary learning (Williams, 1992, p45 cited in Beatie et al 1997) often associated with rote learning. Deep Learning is therefore assumed to be the appropriate pedagogic approach for DfS where understanding needs to be decisively linked to thinking and the planning and making so integral to design. Wanting students to be engaged, enthusiastic, understanding and appreciative of the subject matter is advocating a deep approach to learning (Lublin 2007). The hypothesis was that by employing the pedagogy of deep learning, greater engagement from the students with the problem of unsustainability would be afforded, which by default would lead to heightened DfS solutions through the framework ‘how you define is how you design’.

Industrial Design is in an advanced position with regards to deep learning as the constructivist approach of ‘learning by doing’ is a staple in design courses, Industrial Design almost teaches Deep Learning by default. Yet a comparison between the strategies for deep learning and the teaching of sustainable design highlighted that the unit could be delivered with a far more student-centered approach.

Engaging in the students’ perspective forms the core of Deep learning. The interventions that were implemented as a result of this engagement centered on removing the ambiguity from the unit structure and assessment tasks, while a student-centered focus was achieved through increased peer review and opportunities for personal reflection.

Previously the structure of the unit had phases of Fry’s defuturing operating concurrently, for example students were answering a tutorial question on the historical reasons to why we are unsustainable (focusing on the past) while at the same time collating contemporary trends research (focusing on the present). There was ambiguity in not having a clear focus to the task at hand from the student’s perspective, which reduced the capacity to fully engage with articulating an understanding of the problem (unsustainability). The unit was therefore divided into three distinct sections to provide a clear structure in the past, present and future. The assessment tasks were rescheduled to support this structure, and also reduce conflict with other units. A side effect of the rescheduled tasks was that the actual time spent designing was reduced; a greater period of time was spent deconstructing the problem so that when students were finally asked to design there was a clearer framework for what was required.

To encourage a student-centered approach peer review of assessment was implemented to enhance group cohesion and further progress an understanding of the objectives of the unit. To encourage personal engagement empirical data collated from previous subjects completed by students in LCA personal journals was used to generate current trend research and engage in the student’s experience. Using past assignments is also viewed to encourage personal reflection

throughout the course and build a holistic view of education. To further encourage student reflection tasks were scheduled to allow for development and reflection. Often reflection is asked for at the end of the session when there is liitle chance for change. Asking for reflection in action as advocated by Schon (1991) by asking reflective question intersession allows students to modify the conceptual design scenarios prior to submission of the final assessment.

The majority of interventions planned for 2007 were pedagogic and related to encouraging deep learning. The same theoretical content was presented within class as in 2006, with a slightly altered delivery in 2007. However two notable changes occurred in delivery. First between the creation of the design brief and creativity tools being applied, students were asked to provide utopian solutions that fitted the brief perfectly. From the solution students were then asked how the solutions could be implemented, drawing on Mckenzie-Mohr's (2000) community based social marketing, students identified barriers and benefits to the solutions were then transformed into further design briefs that the creativity tools are applied to. This step was missing in the previous cycle resulting in strategies being presented instead of design solutions.

The second was the presentation of the final concept in the form of a storyboard of the 'conceptual design solution' context. The process of story boarding assists students to think through how there solution is integrated within society. An example was developed and presented to students from previous year's work; this also assisted in setting expectations within the unit.

6. 2007; Reconciling Defining and Designing

The results of the pedagogic intervention appeared to significantly alter the results presented within the unit. The results from 2007 saw 'conceptual design scenarios' embodying Brezets 'System Innovation' increase by 18%, and for the first time saw the majority of solutions embody a 'social' school of thought. The higher achieving students reconciled a sound definition of unsustainability (how you define) with designed solutions (how you design). The solutions moved from strategies as the concept, to strategies with concrete technical designs to facilitate the concept. Instead of presenting sharing as the concept, designs to overcome the barriers of sharing were presented. CBSM potential to generate design concepts appeared successful.

The minor change in presenting story board and designing utopian visions also appeared to have a positive impact. The example (figure 3.) presented as a storyboard highlights how the sustainable strategy is proposed (sharing), but relies on technical design in order to bring the strategy to fruition suggesting a normalization of the role of design's social agency. The poster assisted students to think through the design solution in context.

The process of encouraging students to design utopian visions is one that Andrews (2007) and Fry (1999) argue as dangerous. The utopian visions created by the early industrial designers such as Bel Geddes' Futurama and Dreyfuss' Democracity were top down visions void of humanity, they assumed the god-eye perspective of planning from above as expert, visionary leaders, yet they were complete and detailed but devoid of humanity: people were absent in the visions, reflecting a failure to grasp future social relations (Nye 1994).

The dangers were managed by; A. having an excellent understanding of why we are unsustainable through a defuturing exercise B. forecasting a probable scenario narrative (persona based and therefore human centered) on trends research, making the utopian scenario very much a response to the probable future narrative, not a blank canvas and finally C, Checking the vision with regards to barriers, desirability, implications and normalising capacity of the design solutions. The utopian visions encouraged uncompromised scenarios as the starting point, which moved far beyond the incremental improvements seen in 2005 and 2006 and the majority of EcoDesign case studies presented in the design literature. The scenarios were then worked backwards; the barriers to implementation actually created opportunities for design .i.e exploring the barriers to communal living highlights points for design intervention.

While the minor pedagogic changes when looked at in isolation appear insignificant and trivial, the impact on education is significant, the results across the three years cycle highlighted that the pedagogy of design education has an equal importance to the theoretical content delivered. This should not be underestimated. The process is testament to how Action Research can be utilized within design education.

7. Conclusion

The combination of interventions lead to conceptual DfS scenarios that better embodied the progressive sustainability theories via a better problem definition of unsustainability. This was evidenced by higher instances of systemic social-technical design solutions presented by students.

If we are to re-orientate towards more sustainable directions, enabling designers the skills to seek and define why we are unsustainable, and transform that knowledge into resolved conceptual designs is critical. If designers cannot adequately visualise an appropriate response to unsustainability within the confines of academia, then there is little hope of implementing solutions with the additional pressures of professional practice. The argument presented in this paper highlights the key role education plays as a bridge between theory and practice, enabled by the teacher as researcher. In conclusion a greater emphasis on the problem definition of unsustainability in context leads to higher designed outcomes.

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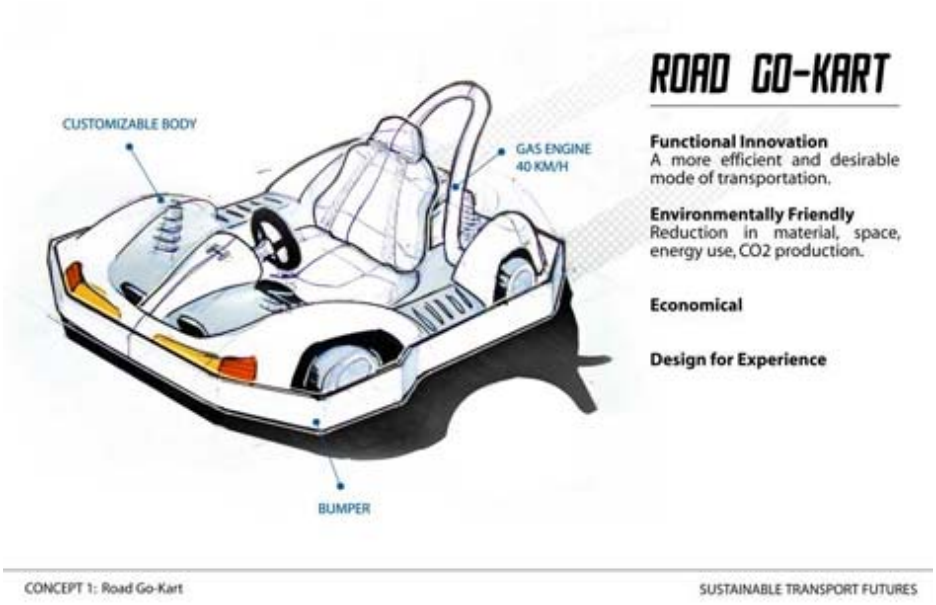

Fig. 1: example student conceptual design work 2005, *Problem Definition*; cars inefficient in fuel consumption and produce emissions. *Design Solution*: Small efficient car

Fig. 2: example conceptual student design work 2006, *Problem Definition*; commuting long distances to place of work and study. *Design Solution*; a suite of solutions that focus on removing the requirement to commute.

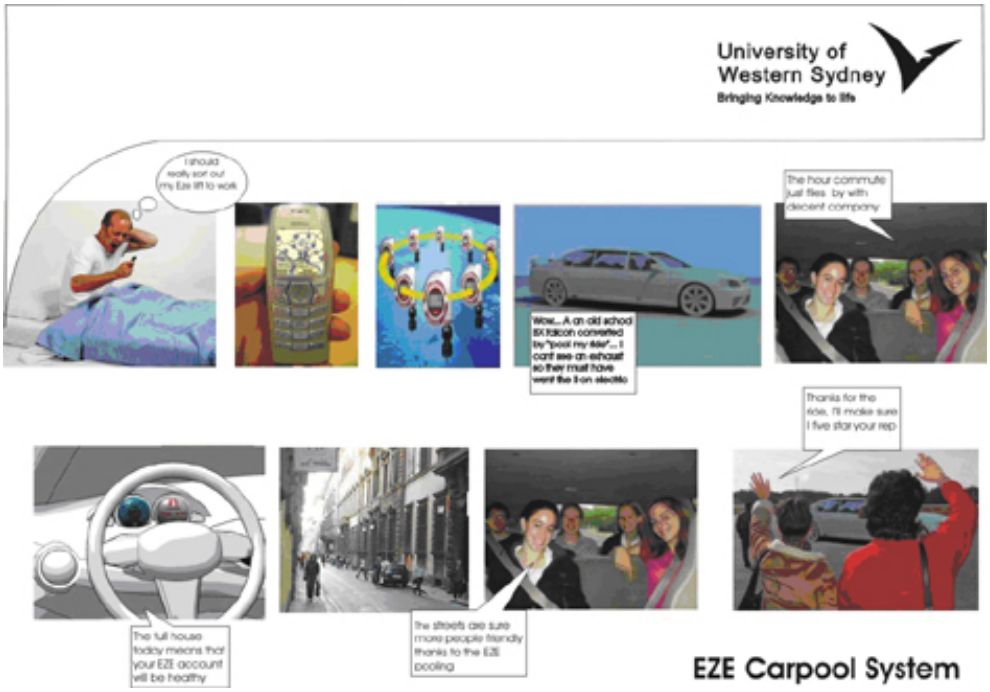

Fig. 3: example student conceptual design work 2007. *Problem Definition;* single car trips on long commutes, inadequate facilities for car pooling system. *Design Solution;* cars retrofitted for sharing and a car pooling service.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Textile Traditions and Fashion Design

New Experiential Paths

Giovanni Maria Conti[1], Federica Vacca[2]

Abstract

The approach to fashion design and system build around it must be faced in cross-sectional way; to work on fashion doesn't mean develop a dresses collection but it refers to the analysis of design processes that generate the project intention.

The paper focuses on the territorial dimension of the project, which is meant to be a resource for the development and support of local economies, helping them to increase the value of their cultural identity and their design process as well as production's know how.

Considering such observations, we can identify a new trend aiming to recover settled in time values, through the strong relationship that connects an individual to a community and manual arts to history and local identity.

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1. Introduction[3]

The approach to fashion design and system build around it must be faced in cross-sectional way; to work on fashion doesn't mean develop a dresses collection but it refers to the analysis of design processes that generate the project intention.

The research focuses on the territorial dimension of the project, which is meant to be a resource for the development and support of local economies, helping them to increase the value of their cultural identity and their design process as well as production's know how. While places and people are closely entwined and where modernity is liquid, the idea of an identity linked to "*what tradition is able to produce*" has a higher meaning, thanks to its relation to local culture, memory and spirit. The so called *Genius Loci*, i.e. what survives the unceasing changes of time, gives to the territory an indelible character and therefore makes it part of a unique and characteristic experience.

We are currently seeing the return and a new discovery of traditional techniques and manufacturing, which have re-appeared in the contemporary world with a new look and a new balance. The set of traditions, meant as material culture, can be identified with the craft manufacture, which becomes the founding element of a community's identity. As it is subject to changes in time, the set has to be interpreted as a variable heritage which should be preserved.

In some cases, the typical local "know how" has slowly been taken over by the industrial production system, which has been able to combine the craft's quality with the most advanced production techniques. This is the case of Italian industrial districts, which historically rise from a set of inherited skills concentrated on a specific territory, and are a perfect expression of an aggregative model of the most edgy Italy. Up to recent times, handicraft has been identified as something hostile to modernity, due to its dislike for standardization. Nowadays instead, it represents a model for the post-industrial production, thanks to its unique characters, its intolerance to "similarities among all products" and its exaltation of the product's personalization.

Considering such observations, we can identify a new trend aiming to recover settled in time values, through the strong relationship that connects an individual to a community and manual arts to history and local identity. The nostalgic memory of the past spreads out, together with the desire to recover objects and memories which belong to the past. If in historical evolution of Design we assist, at first time, to research and experimentation for the realization of an object, and then to research and technical evolution of the product, today we can assert of be observer and responsible in a phase of " Design Experience" where there's the new and innovative concept of design for customer. The new tendency of Design research try to emphasize all the elements that it's necessary to communicate.

Fashion and design, with Art, represent the expression of a society wish, able to understand the changes, rejecting, to the same identity need, the Zeitgeist in a precise historical moment. Continuing technological research, permanent experimentation and discovery of new declination of Design make Design able to become communicators of emotions. Today the object of market and consumption is not only the simple possession of a specific product but it is the experience, as enrichment of the subject, that the customer can live inside new worlds, according to values of the brand that create add value to the existence.

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2. Situation of the Italian Textile System[4]

"The fascination of hand-crafted objects derives from an object having passed through the hands of someone, the marks of whose labour are still inscribed upon its surface; we are intrigued by what has been created; it is unique, because that moment of creation cannot be reproduced" (Baudrillard 1968)

In recent years, the Italian Textile/Fashion industry has been facing a crisis. This is due to market globalization and to delocalization processes, which shift production to countries where labor cost is lower. In turn, this makes it necessary for companies to rethink their creative, productive and distribution activities.

The Italian textile sector, with its historical traditions, is characterized by a system of small-medium independent businesses, highly specialized in different stages of the same production process. Italian companies were able to introduce into the market a remarkable variety of products with innovative design and technical content. Moreover, the particular attention placed on style and aesthetics has been the key to the success of *Made in Italy*.

This particular business organization model, i.e. the *industrial district*[5], is a local system strongly based on one, primary production activity. In order to increase production, the companies belonging to this system tend to develop synergies.

The industrial district model has two strong points. The first is its tight connection to the territory it belongs to, based not only on shared technical/productive know-how, but also on a common entrepreneurial culture and shared values. The second is its systemic approach in developing connections between companies working within the same production chain. Such systemic approach improves the district's overall efficiency according to the *flexible specialization* model, that is, the system's ability to react to internal and external changes. For instance, we can talk of "product flexibility" when companies produce a new product or radically change their product, or we can talk of "process flexibility" when companies are able to modify the production processes employed for the realization of their product.

Thus, Italian textile industry is characterized by a high fragmentation of the production chain among different companies. Virtually all of them are small or very small companies specialized in different stages of the textile-fiber and yarn manufacturing. They are unable to compete on the market with bigger companies that can delocalize their production in more competitive and remote countries. The progressive loss of the district's expertise and specialized personnel can be an important consequence of this mechanism. In addition, its productive know-how could be transferred to emerging countries, which would become even more dangerous competitors.

Due to their difficult market situation, companies need to find new strategies and new products, as well as achieving better quality, flexibility and product personalization. This is how they will be able to enhance the value of their specific production.

The crisis of the textile sector is to be faced with a well-defined entrepreneurial policy; priority must be given to continuing research and product innovation, as these are crucial steps towards the reconfiguration of the textile/ fashion system within today's overstocked market.

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[5] In Italy the status of *"industrial district*" has been acknowledged by Law 317, 1991 (Interventions for the innovation and development of small businesses). According to this law, districts are local areas characterized by a high concentration of small businesses, and by the productive specialization of all the activities involved.

3. The recovery of tradition[6]

Today there is a renewed interest in traditional techniques and productions, which return to the contemporary world with a new aspect and new functions.

From the etymological point of view, tradition is "*the transmission of past generations' cultural heritage (i.e., laws, habits, memories, historical facts, etc.) by means of written documents or verbal communication".* It can also be defined as *"cultural content transmitted by past generations that can contribute to the preservation of identity*"[7].

The cluster of traditions intended as *material culture* is identifiable with crafts production. This kind of production, therefore, becomes a founding element of the identity of a community. As it changes throughout time, it can be defined as variable heritage that must be preserved.

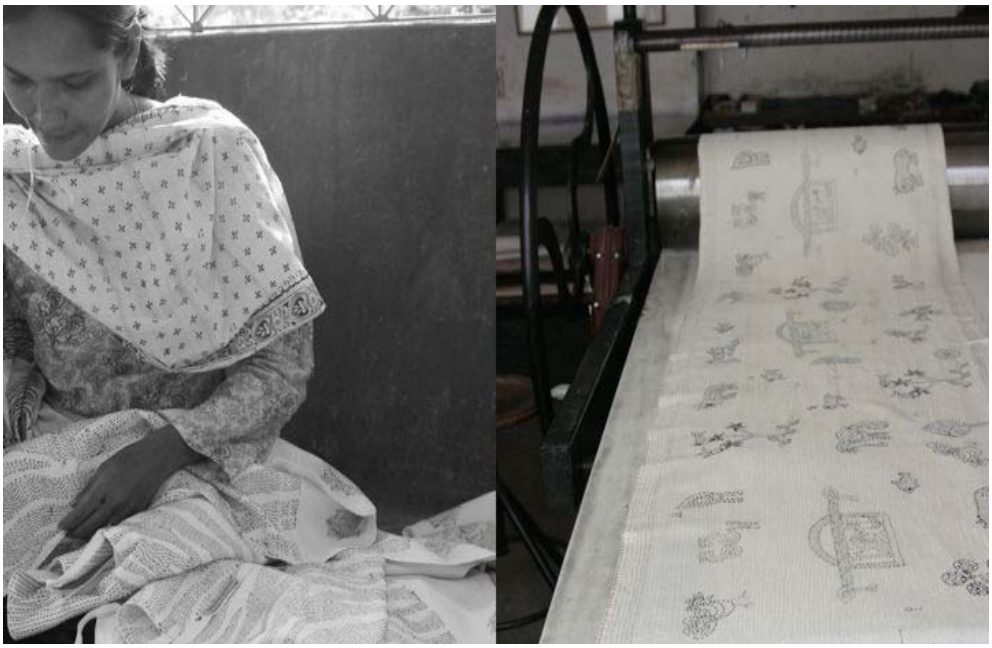


Fig. 1: Craftswomen at work on the Yooj collection.

In some cases, local *know-how* has been absorbed by industrial production, by combining crafts quality with the most advanced industrial systems. This is the case for industrial districts. Historically, they originate from a locally-concentrated heritage of skills, and represent today a successful aggregation model within Italy's most advanced region.

In the recent past, due to its open rejection of standardization, crafts activities were viewed as hostile to modernity. Today, on the contrary, craftsmanship has become a model for post-industrial production thanks to its unique character and personalized production, which rejects today's "everything is the same" mentality. Crafts help defining the cultural identity of production through their ties to culture, memory and tradition, and by doing so, they potentially become an element of innovation.

While cultural elements are often neglected by the industrial production system, they hold a crucial role in local crafts productions. Indeed, the value of the product depends less on its material quality than on the symbolic, emotional and identification meaning that consumers see in it. Therefore, craftsmanship in all its forms can be seen as "memory of habits" and "*transmission*

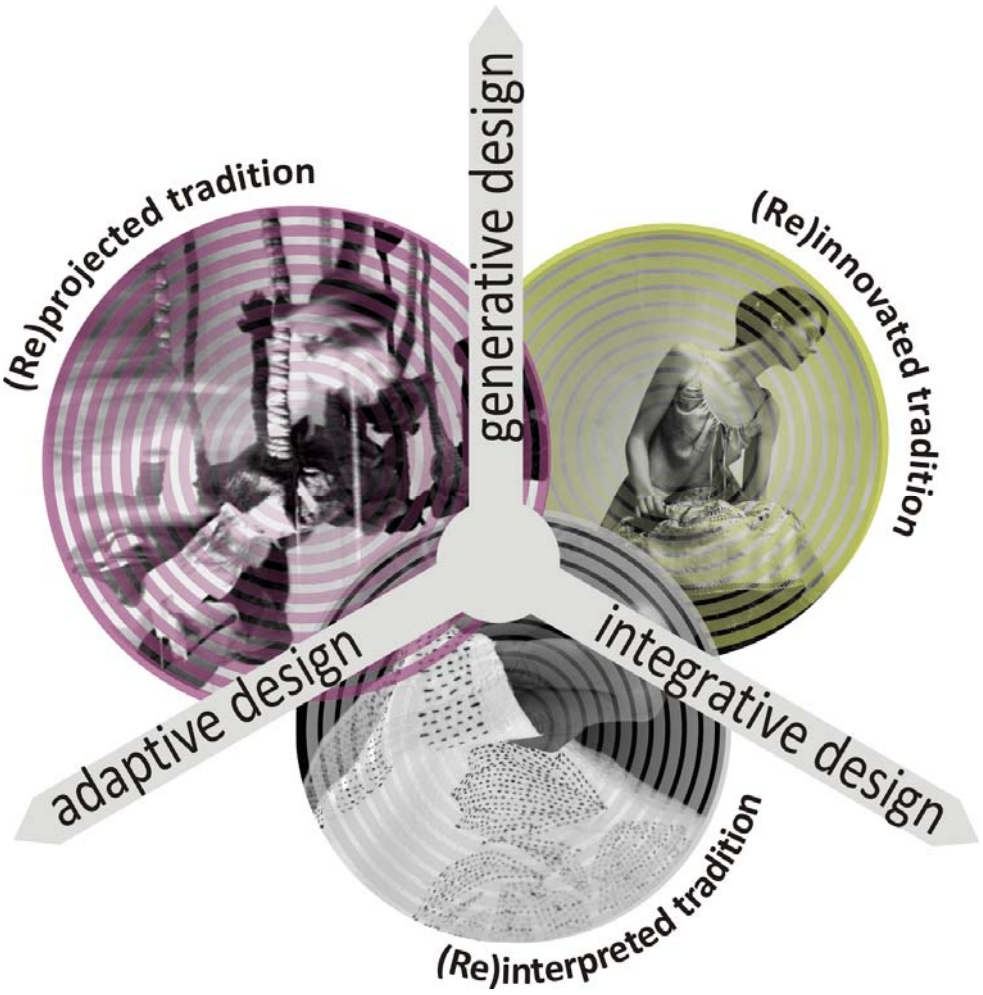
[6] By Federica Vacca, Politecnico di Milano (ITALY) - INDACO department.
[7] Definition from "Il Grande Dizionario Garzanti di Italiano", updated edition, 2007.

of meanings". It embodies the complexity and variety of a dimension which, when unable to transform itself, tends to inevitably disappear. The preservation of identity as a positive inheritance of crafts culture, as well as the transformation of planning and productive processes, means the creation of new languages that re-interpret crafts techniques with a contemporary taste, and avoid the passive reproduction of style and form. In other words, this process no longer produces traditional goods, but it produces value.

For manual arts in the textile sector, the relationship between tradition and modernity is crucial. We can talk of product innovation when a product is perceived as "new" by the market due to the way it looks, its characteristics, performance or meaning. On the other hand, we can talk "process innovation" when its aim is to cut costs, and add value to traditional processes connected to local identities, and to be more sustainable, flexible and fast in answering market needs. The analysis of planning and production processes leads to the identifications of different actions that can be performed in order to innovate the textile sector and recover local know-how by focusing on the development of high added-value market niches.

In terms of process, there are three possible interventions that can be performed:

- **adaptive** actions, that is, the adaptation of external know-how. Production is given a new meaning through the transformation of existing processes.
- **integrative** actions, that is, the integration of pre-existing know-how belonging to different sectors of production.
- **generative** actions, which tend to develop new know-how and competences.



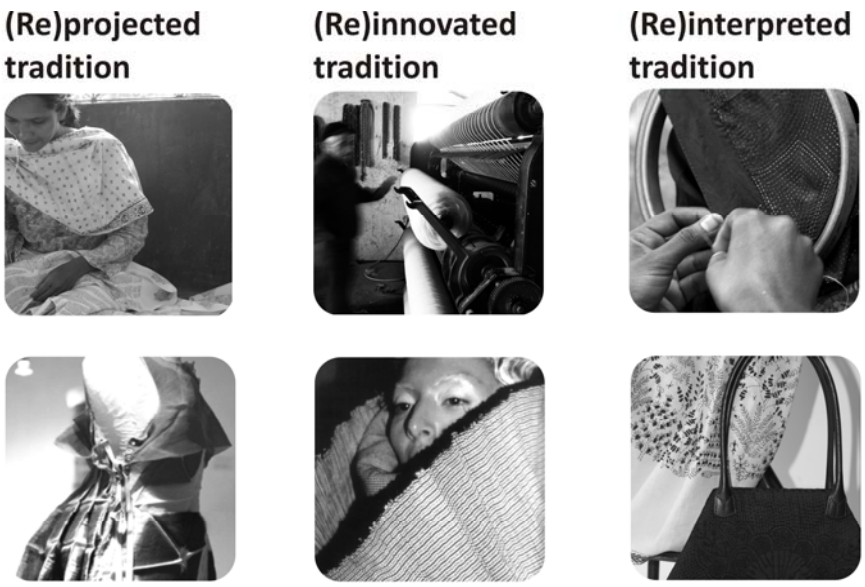


Fig. 2: Combination of interventions in terms of processes, as interpreted by the author.

Possible kinds of innovation connected to the *material culture* of craftsmanship can be obtained with a combination of these actions:

_**(Re)projected tradition:** production processes and textile techniques – from spinning to dye- are de-contextualized and transferred from the place of origin to new contexts with new codes. This is an *adaptive*/*generative* action because, on the one hand, existing crafts techniques are *adapted* to different needs, re-projected and removed from their original context; on the other hand, this transforming action can also *generate* new languages and new meanings according to market needs. As a consequence of this action, the original identity of the process is inevitably lost. The cluster of traditions and memories that informed the process identity are dissolved. Indeed, the process is no longer performed by expert craftsmen that inherited the know-how from past generations, but it is performed by new craftsmen who learned these techniques and re-interpreted them by revisiting their concept and meaning. If techniques with specific identities are passively reproduced, the importance and meaning of crafts tradition is at risk. On the other hand, this action can provide new, vital energy to techniques that would otherwise be lost due to the sector crisis, by combining them with new and more market-oriented know-how.

_**(Re)interpreted tradition:** manual traditions are recovered by partially removing them from their context. While the productive know-how continues to have its roots in the local territory, the planning process is performed beforehand by an external figure that projects the local know-how towards new results and different markets. This is an *adaptive*/*integrative* action because, on the one hand, it *adapts* handicraft productions to planning strategies different from those that traditionally belonged to the territory, thus producing innovation. On the other hand, it also *integrates* the know-how connected to these different planning strategies. In this case, techniques do not lose their identity; rather, the final product is improved by the addition of new meaning belonging to different contexts. If not supported by strong planning strategies, these techniques and the cultural heritage they come from are at risk of becoming copies of themselves. This approach is strongly oriented to the quality of the final product, which must be improved in its aesthetical form and in the codes and meanings it conveys.

_**(Re)innovated tradition:** traditional processes remain strongly tied to their original territory, therefore become an innovation tool for local communities. This is an *integrative*/*generative* action because, on the one hand, it *integrates* different processes which, in turn, generate a new process, with renovated projects and products. On the other hand, it

generates a new language that adds value to the final product. It is crucial to define a specific strategy that can combine memory and innovation according to new codes of expression. At the same time, it is important to activate processes and cultural changes that can produce innovation and development, and that have positive consequences for the local territory. Indeed, the greatest advantage of this action is precisely the involvement of local communities with shared identity. This action is highly process-oriented; that is, the process is the starting point to obtain an innovative product, both in its material aspect, improved by a specific planning, and in its immaterial aspect by adding new languages and meaning.

4. Emotional&Experience design. Designing objects or designing values?[8]

"*User's Experience is a specific reflection tool for many disciplines and activities connected to entertainment, consumption and design*"[9].

In the last few years, some aspects of consumption and entertainment have changed into dimensions where "*subject-consumers are surrounded by fluxes and inputs that make them experience something*"[10]. The continuing technological research, the constant experimentation and the discover of new dimensions for Design, lead Design itself to convey emotions.

The object of consumption is no longer identified with the mere possession of a given product; rather, the object of consumption is the *experience*, meant as the self-enhancement that the subject-user can experiment within new environments. These dimensions are coherent with the brand values and experience of a certain brand, created to add vital elements to existence.

"*Emotions modify the way in which human mind solves problems*", claims Donald A. Norman in his book *Emotional Design*[11]. "*The emotional system modifies the operative modes of the cognitive system*". Emotions are defined as vibrations that slip into the body and provoke curiosity, which, in turn, facilitates learning.

"*Emotions are the organism's answer to a change within us or outside us. They arise when something is not like it used to be a moment before, thus modifying the subject's status and provoking a feeling of uneasiness (negative emotion), or a feeling of well-being (positive emotion). Emotions arise from changes, and each change entails movements; in this case, inner movements that are then expressed outward. […]*"[12].

Emotion is therefore traced back to memory. In fact, emotion is not merely a factor influencing mystic functions, but emotion itself becomes a kind of memory. Senses are the starting point for the formation of emotions; external inputs reach the brain, which in turn responds to complex interactions. The brain's answers can be physical reactions, such as the increased heartbeat and perspiration, or behavioural reactions such as fear, rejection, joy. Emotions make us act and react according to the inputs received. Emotions interact with other systems within the organism, such as the cognitive system, the immune system and the perceptive system.

In time, the emotional component gained a very important role, especially for consumption activities. The sensorial approach has been universalized. Shops have become the place of cultural suggestion, while the *open museum* combines products sale with art, cinema and theatre. The new concept of *Experience shopping* defines an experience lived by consumers through the definition of 5 mental macro-areas: thought, feelings, action, relationship, sense. Recent studies analysing the relationship between men and the environment underline that space is not neutral

[8] By Giovanni Maria Conti, Politecnico di Milano (ITALY) - INDACO department.
[9] Simeone L., *EXPERIENCE DESIGN*, "AVATAR" n°2, November 2001, p. 37
[10] Simeone L., p. 38
[11] Donald A. Norman, *Emotional Design.* Apogeo, New York, 2004
[12] S. Giambelli

but generates mental states. In other words, different ways of organizing space have a specific effect upon our nervous system. This new paradigm provokes new experiences and interdisciplinary encounters, like between architecture and medicine, or between fashion and crafts.

5. Emotional experience[13]

"*Design will help people to live better lives by offering an emotional and functional sense to their experience. Design will help marketing companies in planning an innovative future. […]*"[14]

Pleasant objects contribute to a sense of psychological well-being, because in stressful situations our mind tends to move on to the idea of the problem. Our brain is sensitive to certain situations and reacts in a positive or negative way. Senses contribute to the brain's elaboration of emotional states. The holistic attention to sense stimulation is today one of the most interesting approaches to design. Senses as a stimulus for memory; memory as the re-discovery of inner values; senses and memory as the essence of emotions.

Emotions reflect experiences, associations and personal memories. In their book *The meaning of Things*[15], Mihaly Csikszentmihalyi and Eugene Rochberg Halton interviewed a number of people in their homes, hoping to grasp their relation with the objects that surrounded them. In particular, they asked each interviewee to show them objects they considered special. It emerged that such special objects were objects connected to particular memories or associations. In other words, "special" were those objects that evoked a special feeling in their owner, and that brought to mind stories from the past. Rarely did interviewees attribute value to the object in itself.

We tend to feel close to object if they bear meaningful, personal connections. Even deeper is our relationship with places: our favorite corners of the house, our favorite places, our favorite landscapes. "*I'm sure that buildings last in time just because they manage to absorb the emotions of their inhabitants, weather happy or sad*"[16]. What we really connect with is not the object itself but the relations, meanings and feelings that object represents. In the design field, traditional crafts and techniques change their meaning. They are no longer connected to functionality, but they embody the history and the intrinsic narrative of those who invested the object with their time, love and passion. Objects are no longer constructive elements but experiential *cultural objects*.

5.1 Experience design: visceral, behavioural and reflexive

Human reactions before an object are complex and determined by different factors. Some of them come from within the individual, from his or her personal experiences.

Every design object is destined to prompt in its user a certain behaviour, therefore an experience. Achille Castiglioni used to say that we don't build objects but behaviours. More than a given kind of design, the expression "experience design[17]" evokes a design philosophy. It is a way to think and look at design from a relational and complex point of view. Experience Design is a way of conceiving the product beyond its aesthetical characteristics. It designs emotions and behaviours for the user. It has an emotional, functional and cultural impact. This approach has its roots in the work of J. Gilmore and J. Pine. They described how, in an "Experience Economy", the relation between products, places and experiences change in its form and modalities. There are

[13] By Giovanni Maria Conti, Politecnico di Milano (ITALY) - INDACO department.
[14] Morace F. "*L'innovazione Rinascimentale. Il design ci salverà. Ma come?*", in 7thFloor, Number 11, Volume 2, 2008
[15] Csikszentmihalyi M. and Rochberg-Halton E., *Il significato degli oggetti: i simboli nell'abitazione e il sé*, Edizioni Kappa, Roma, 1986
[16] Yoshimoto B., *Il coperchio del mare*, Feltrinelli, Milano, 2007, p 44
[17] For further information see AA.VV, "*Il* design*: un'attività di generazione di senso*". Interview to Roberto Verganti, ALIdesign, Milan April 2003, Flusser V., *Filosofia del Design*, Bruno Mondatori, Milan 2003, Simeone L., *EXPERIENCE DESIGN*, "AVATAR" n°2, November 2001, Ceppi G. "Il design dell'Esperienza", in Bertola P., Manzini E. (2004), *Design Multiverso*, POLI.design publications, Milan 2004

three levels of design: *visceral design, behavioural design and reflexive design*, each of them with a distinct role in the shaping of individual experience.

Visceral design concerns immediate reactions linked to human nature. It is fully based on the immediate emotional impact. *Behavioural* design is based on use. Appearance is not very important, what counts is performance. Tactile and sensorial perceptions are crucial elements for a behavioural judgment of products. Men are biological beings provided with body, arms and legs. A great part of their brain is occupied by sensorial systems that are constantly engaged in exploring and interacting with the surrounding environment. Finally, differently from the other two kinds of design, *reflexive* design is linked to the message, culture and meaning of the objects, and to the personal memories they evoke. Reflexive value goes beyond behavioural factors, because products can be more than the sum of their functions. Their true value consists in answering people's emotional needs.

Attraction is a visceral phenomenon; beauty comes from a reflexive dimension and from conscious experience. Therefore, it can be claimed that every object has a soul, no matter if it's real or not. Every object has a value attributed to it by those who use it and by those who created it. The latter, in particular, leave on the object a permeating, unique expertise. This is the soul that makes the object "live".

But as Pino Mantovani claims[18], "*the thing is 'other', that is, we define 'otherness' as the 'thing'. Even when we cross them or they cross us, things have different life rhythms and consistency levels. This is why sometimes things intangibly float away, and sometimes they hit us and undermine our proud intangibility. Things do not belong to us, actually the contrary may be true, that is, things may own us. If we accept this, we can imagine that a path keeps tracks of all those that walked on it, far beyond the actual life-span of the last footprints…*"[19].

If we consider Industrial Design as a cultural activity which, in fields dominated by creativity and taste, can convey technological, economical and production knowledge, then Industrial Design will have a specific task. Namely that of "*not only recovering some of art's essential roles, like making the world 'beautiful', or having a role similar to critical thinking, but it could also improve the entire organization of society.*"[20].

Today, innovation is a transformation in the way problems are thought of. If in the past innovation could have been a change in color or in shape, nowadays innovation means researching and experimenting on new materials. This can be done through new technologies or by recovering sartorial techniques specific of a given sector or industrial district. Therefore, the contents of a project are not limited to material products.

A project is a primary activity with capillary ramifications in all human activities. As a consequence, it does not belong to any specific profession. This is why we talk of *cross fertilization*, that is, transfers of knowledge between complex know-how, operative methods and planning approaches. This entails interdisciplinary cooperation between different fields of human knowledge, to the aim of creating innovation.

By introducing objects into the world, design partecipates in the planning of culture. Therefore, the history of designed objects becomes the history of culture. A functional object is, by its own nature, multifaceted, elusive and full of meanings. Throughout time, every object has had different meanings connected to its origin. Regarding the world of objects, the most urgent question concerns objects' future, or the future of design and its social role. In the introduction to Maurizio Vitta's book Il Disegno delle Cose, Mario Antonio Arnaboldi describes the future of design with these words: "*Objects' evolution does not lie in the repetition imposed by mass*

[18] Pino Mantovani in *Valeria Scuteri. Canto di donna. Canto di telaio*, Celid, Torino, July 2004 (Catalogue of the Exhibition, Chieri, Palazzo Opesso, 11th September – 10th October 2004)
[19] Pino Mantovani op. cit. p 9
[20] VanSevenant A., *FILOSOFIA DEL DESIGN, in IL FASCINO DELLE MERCI* ágalma, Castelvecchi, N°1, Roma 06/2000, p. 64

production, but in their originality. Such originality must be capable of grasping and answering society's real needs"[21].

6. Possible new visions: Antonio Marras[22]

"*Tradition is not a model to be copied, but the support upon which ideas take shape. There is no modernity without tradition*". This is Antonio Marras' philosophy, an artist/craftsman/fashion designer who pioneered the recovering of Sardinian handicrafts. Marras was born in Sardinia and there is where he decided to live and work, getting away from big fashion centers like Milan and Paris, where Marras presents his *prêt-à-porter* collection and *Haute Couture* collection for the Maison Kenzo. Marras style is very attractive and based on a distinctive creativity, connected to tradition but also linked to other cultures and epochs.

Marras' style is dominated by manual skills and knowledge, and is characterized by layers of fabrics, embroideries and decorations. Therefore, the piece of clothing is often unique as the creations of ancients dress-makers.

Fig. 3: Antonio Marras. On the left, a detail of a jacket with visible seams. On the right, a detail of a *Haute Couture* dress of the fall/winter collection *Adelaisa di Torres*. Made with Sardinian traditional pleating technique.

In Marras' collections, details and decorations are so many that poorest materials become rich through intersections, additions and overlaps. Free seams and tangled threads, inspired by

[21] Maurizio Vitta, *Il disegno delle cose, Storia degli oggetti e teoria del design*, Liguori Editore, Napoli, 1996
[22] By Federica Vacca, Politecnico di Milano (ITALY) - INDACO department.

Maria Lai's work[23], are some of the elements that define the essence of *Marras' style*: incompleteness, irregularity and hand-made quality.

As a consequence, techniques are fundamental. It is important to consider the very nature of textiles as an element that supports the collection narrative. Materials lead into a kind of sensorial process based on coherent elements: the tactile and chromatic aspects of fabrics, their relation to light and their material and sensorial value in relation to objects.

Serial production cannot guarantee the attention to details sought by Marras, nor can it reproduce the infinite decoration motifs that he applies to each model. Therefore, Marras needs the handicrafts skills he finds in the women-tailors from Ittiri, a small village near Alghero, heirs of the Sardinian art of embroidery. Marras entrusted them with the manufacturing of a limited collection called *Laboratorio*. With this line Marras conveyed the most creative and experimental side of his research. Each piece of clothing is almost a unique work of art due to the exceptionality of traditional embroidery.

With his catwalks, Marras tells us about a journey through time, and about an encounter of memories; he tells us insights from his own life and that of people around him, mixed with quotations from art and theatre. Together with Sardinian culture and the recover of manual skills, these are the founding elements of Marras' unique creative language.

Marras is the narrator of his own land, of abandoned and unguarded traditions. His attitude towards the past is that of recovering forgotten elements and bringing authentic stories back to life, with strong roots in their place of origin (Mancinelli 2006).

Narration is a fundamental elements in Marras' collections. Behind them there is always a narrative cue that inspires visual connections and original encounters. The narrative potential of clothes and ornaments is enhanced by the catwalk setting, a stage that introduces the public to an emotional narrative told with truly spectacular performances.

"*When I prepare a collection, I always start from the desire of telling a story. I choose the fabrics I like and I gather ideas that are turned into what I would like to tell, as if they were a script*." (Marras in Mancinelli 2006).

7. Conclusions[24]

In this context, design becomes a necessary interface between tradition and modernity. The role of design is important in order to make crafts production more contemporary.

Two possible interventions can be outlined. In the first scenario, craftsmen are cut out from the intellectual planning process, which is under the exclusive responsibility of the designer. The design/crafts/company relation is univocal because there is no exchange nor transfer of knowledge between the parts. The contribution of design is merely formal as it recovers and re-interpret classic codes and traditional materials, while crafts are viewed as a know-how tank to be exploited. If craftsmen do not fully understand nor feel part of the process, they will not comprehend the tools, processes and skills provided by design to answer market needs. This scenario could therefore remain an extemporary experience limited in time.

The second possible intervention requires that from the very start of the planning process craftsmen are considered equal partners within the project. Thus, the design/crafts/company relation is bi-univocal because there is a connection between designers' planning process and craftsmen's skills. They therefore cooperate in the planning and development of the product.

[23] Maria Lai. Sardinian artist who studied sculpture with Arturo Martini. In the core period of her career in Rome, she pursued a very personal search for community ethics and the myth of narrative. Her interest towards feminine manual skills and towards popular culture inspired some of her fascinating works such as *Geographies*, maps embroidered on fabrics and velvet, and *Sewn Books*: at first undecipherable writings, they then become fairy-tales told through sequences of images and patchwork.

[24] By Federica Vacca, Politecnico di Milano (ITALY) - INDACO department.

Such bi-univocal relation ensures that this experience can be repeated in time, and becomes an important innovation element for crafts production. Indeed, design activates an exchange of knowledge and expertise between the parts, thus transforming the traditional production process.

In the light of what has been claimed so far, it is possible to outline a new trend that aims at recovering cultural values accumulated in time through the strong connection between individuals and their community, and between crafts and local history and identity. There is an increased nostalgia for the past and wish to recover objects and memories from remote epochs. The encounter between different approaches, such as design and crafts, produces new ideas for products with different and unique codes. Due to these intrinsic characteristics, local products are *highly differentiated* goods (Sassu, 2003), and become "*cultural objects*" because they belong to a specific local identity. (Lai, 2007). Emotion is the key to unique experiences. Crafts and design can both re-elaborate tradition in a personal and unique way. Handicrafts convey the value of quality by evoking collective memories and the nostalgia for a remote culture charged with symbols and meanings.

Experience becomes representation, a scenario created by the *director* to arise emotions in the *client*[25]. This cannot happen in the world of crafts activities, because here the scenario is a fixed element provided by the territory in which they originate. There is a sort of *Emotional Geography*[26] in which space is emotionally experienced through memory and a the desire of experience. "*An internal and external landscape, made of people, things, imagination and intelligence, is always part of narrative developments. And it is precisely this landscape that gives meaning and sense to events and characters*" (Bruno, in Brogli, 2005).

Objects become icons that testify each culture's origin. Their power is conveyed through memory. Indeed, its narrative can combine archetypical images and future suggestions within a fascinating present. *Emotional Design*[27], as intended by Donald Norman (2004), defines a specific viewpoint within the context of design, by taking into consideration the emotional aspect of the man/object relation.

"*We tend to feel close to objects if we have a meaningful, personal connection with them, if they evoke pleasant and comforting moments. Perhaps even deeper is our relationship with places: our favorite corners of the house, our favorite places, our favorite landscapes. Actually we are not attached to the thing itself, rather to the relation, meanings and feelings it represents*" (Donald 2004). Thus, traditions are not an obstacle to innovation and creativity. From traditons arise knowledge and experiences that can be the starting point for new forms of expression. "*Tradition does not oppose progress, on the contrary it is the basis for any new challenge*" (Balfet, 1981).

[25] ibidem

[26] *"Emotional Geography"* is a theory by Giuliana Bruno, philosopher and professor at Harvard University. In her *"Atlas of Emotions",* Bruno analyses the universe of our emotional experiences. *"When I talk about Emotional Geography I am thinking of different perspective about daily life, of journeys inspired by a novel, of childhood smells. Or perhaps just imagination and memory. Itineraries that generate atmospheres, feelings, emotions that can arise by walking along familiar roads or in unusual places. Perhaps not exotic places, but places whose soul we can perceive"* (Bruno in Brogli, 2005).

[27] The expression "Emotional Design" has been defined by Donald Norman in "*Emotional Design*" (2004). His analysis underlines three aspects that need to be correctly balanced:

_**Visceral Design** *"is what nature does"* (p. 64). It is a simple kind of design, connected to the *visceral,* immediate impact before an object, which we perceive as pleasant because we find it close to our own nature.

_**Behavioural Design** *"is fully based on use"* (p. 68). This aspect of design normally coincides with usability. Norman defines four characteristics: function, comprehensibility, usability and physical perception. This kind of design is analyzed in Norman's "The Design of Everyday Things".

_**Reflexive Design** *"is connected to message, culture, meaning"* (p. 82). It takes into account the personal and social meaning held by design.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Sustainable Design r&d - Geneva

Bringing University and training design towards Sustainability

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Abstract

How to introduce the visions of the sustainable development in alls missions of the university of art and design? This was the main interrogation to make this project. What should be analyse and why? What are the methods, and tools should be implement? Which roles the university of art and design to promote sustainable development can play? Finally, how to inform, to training and to integrate directs and indirects actors of the university into the process?

Teaching Sustainable issues in design professions embody a huge potential for accelerating the change towards sustainability development. New transversally action platforms are necessary. Bringing a common understanding of the sustainable development is a key condition for a successful integration of good sustainable practices.

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1. Introduction

"How can we introduce sustainability knowledge and practices in the University of Art and Design?" This was the very beginning question that the members of the research team asked themselves independently in 2004. What began with a simple aim, became an important platform that is already interacting with hundred of actors and decisions makers in the heart of the international City of Geneva in Switzerland.

The scientific goal of Sustainable-Design R&D is to search and develop specific methods, which should help integrating sustainability in education and strategic missions of the Universities of Art and Design with their specific departments and teaching fields.

This research project is financed by the strategic research and development funds of the University of Applied Sciences in Western Switzerland (HES-SO) and takes part of the competence Network in Design (RCD). The project is further co-financed by the research and development funds of the Geneva University of Art and Design (HEAD) with their strategic investment funds, and the University of Applied Engineering (EIL). An additionally contribution in form of working participation, was offered from the seven project partners.

This paper presents the research program Sustainable-Design R&D with their scientific methods, questions and results, but also to show experiences in retro perspective point of view from the research team. Those experiences can give answers to the conference aim, which is focused in changing the change.

The research team of the project was built from three distinct researchers, with the task to insure the function and management of the research and their related investigations and analysis. The punctual collaboration with partners and people receiving benefits, allowed validating and reflecting their work. The partners covered the essential competences needed in the field of study, and was chosen in the aim to have a preference for local resources. Some independent consultants in very specifics topics like history of sustainable design, teaching or eco-design, gave a supplementary support.

Context

The research activity in the faculty of Design in Switzerland started in 1995 with the promotion of Applied Art schools into Universities of Art and Design. The first Swiss research and development project in Design was published in 2001. In the field of sustainable development, the Swiss research began around two decades ago. Education as the best-known field in the investigation of the project Sustainable Design R&D, started his research activity already centuries ago.

In the last twenty years, the notions of Sustainable Development entered gradually in the society and became already popular. The preamble of the new Swiss federal constitution included its principles since 1999. This legal situation in Switzerland is found in all political levels: country, states, municipalities and public establishments. Even the University of Applied Sciences of Switzerland (HES) included the Sustainable Development in its fundamental texts.

During the last few years, the sustainability movement started to transit from the founding texts to praxis. This research project emerged in this political context and was since the beginning supported by the actors of federal and states offices. At the same time, the United Nation Organisation launches a decade (2005-2014) in education for a Sustainable Development, which was ratified in 2005 by the Swiss Confederation. This decade started with a national conference in Geneva, what is certainly not a coincidence. Indeed, the city of Calvin looks back to several movements for the improvement of human conditions and environmental issues, and developed around these topics a dynamic framework of actors and institutions.

Geneva has more than one active institution in design training. The Geneva University of Art and Design (HEAD) as a part of the University of Applied Sciences in Western Switzerland (HES-SO), is the only one in Geneva, where Design can be studied at the higher level. The

HEAD experienced important changes during the time, where the research took place. Implementations of the Bologna principals, restructure of the departments are only a few selections of their changes.

Only some 70 km away from Geneva the Lausanne University of Arts and Design – also part of the HES-SO – have the same faculty on the same level. But their missions roughly like: Geneva as a pole of Design and Art, and Lausanne as a pole of design and technologies.

2. Research programme

To manage efficiently the interdisciplinary competence network connected to the project, the research team chooses a project management witch enabled them to consult – according to the needs – their partners and the actors. In the selected structure, each part preserved its own investigation methods. Information were collected by the research team, formatted and validated by the members of the working group.

Methods

A series of different, quantitative and qualitative methods, were used to collect the necessary information. The investigation field of the case study moves around Sustainable Development, University (Missions and Structure), Education and Design. To analyse the state-of-the-art, the research team worked with the academic and Agenda21 methodologies.

The first step consisted to collect the necessary information to analyze correctly the fields of the case study, which includes administrative structures, contents of the courses, material conditions and professional practices.

According to this task, the research team built thirst his knowledge framework trough the analysis of theoretical documents, books and studies on the various topics around the field of this case study. These documents and topics were chosen within different networks and institutions active in this field but also within actors that already had some experiences in other universities. This preliminary work enable the research team to develop a series of questionnaires, which were used to collect the necessary information for analyse of the state-of-the-art. These questionnaires related to the missions of University and Departments, to the design profession, to a regular study project, to the practices of teaching, and finally to the users habits. The outcome was compared with sustainable practices and measurements and allowed by side to learn more about the actor's values and their knowledge about sustainability.

The second part of the research has to confront the actors with the sustainability process, and help them to support and apply the Sustainable Development principals.

The research team organised round tables – according to the missions of the University, the infrastructure and the teaching – gathering the specific partners in the objective to select the priority elements of the obtained investigation results. These meetings allowed to reflect the results of the investigation of different point of view and to make an appropriated selection of tool and methods, which enabled the research team to address them afterwards to the actors through Focus groups.

These focus groups integrated the actors of the University to let them participate in the outcome of the proposals. The research team organised this Focus groups in two different levels. First level: The management board of the University formed by the director, the administrative managers, the education managers and the research institutes leaders. On the second level: The department, formed by the professors and persons in charge of the department. For each Department a specifics focus group was held.

The results out of the full investigation – questionnaires, talks, round tables and focus groups – allowed finally generating and developing recommendations with the support of the partners.

Investigation field

The state-of-the-art of the different fields of study leads us to the following observations.

The Sustainable Development has already become a common notion in Switzerland. The fourth Assessment Report of the Intergovernmental Panel on Climate Change, which proved that human activity is heavily responsible for global climate change, put the sustainability in the centre of medias and discussions. That's probably also the reason why a lot of people understand Sustainability like an environmental concern. Many tools for environmental improvements are in fact arising during the last ten years, but only few concepts care about the social issue of the sustainability concept. The lake of a common understands of the sustainable principles in connection to the current issue, don't allow people to see the real challenge of this concept.

The construction of the University of applied science in Switzerland provoked a huge structural change of existing academic structures during the last ten years. These changes were accompanied by a general growth of Universities. The quick change and a complex administration structure seem to break the potential to shift quickly towards sustainability. More and more Universities in Switzerland integrate the aim to go in the Sustainable Development but only few of them have already done something concrete. In general the first faculties they started to care about sustainability are situated in the environmental fields. The new teaching program (Bologna) and the still ongoing transformation process into the new University of applied science in Switzerland, with their financing and administration, make it possible to imagine the integration of the Sustainable Development on all levels of the institution.

Since the United Nation Organisation decade in education for a Sustainable Development in 2005, some Swiss school and university had engaged them self to integrate Sustainability in all levels of education. Non-governmental and student organisations contributed a lot to accelerate the change by making programs of pedagogical to shift education towards Sustainability. Methods and research experiments in this field presents several solutions according to the Sustainability principals, where can be introduced in the design training. However, the abridged duration of the design studies can braked with a successful integration of teaching the complexity issue as a part of the Sustainable Development.

Environmental issues and some social critical approaches exist in design practices since 1960 but are still criticised or minimised from a majority of the design community. The training in design doesn't focus until yet on environmental and social issues. The difficulty of the design community to put themselves behind a common definition of their practice, make it difficult to share the goals and visions.

A sustainable University of Art and Design

The principles stated previously are those included here in the objective of defining what means concretely the application of the concept within the framework of the design, the higher education, and finally within the framework of a University of Art and Design. The application of the principles of Sustainable Development can be at two different levels:

1. Strategic level (strategic positioning, interdisciplinary, pedagogic methods, etc.)
2. Management level of the University (infrastructures, personnel management, prevention, participation, transparency, etc.)

The research team identified a certain number of points that can be used, as general principles relating to sustainability and that can be the base for a "Sustainable University of Art and Design"

Positioning of the University

- Integrate the principles of the Sustainable Development in all missions
- To use the sustainable development like a strategy for the positioning of the university

Quality

- To set up processes, management and evaluation tools
- To valorise the existing sustainable experiments

Pedagogy, didactic and contents of teaching and search

- To train all teachers in the Sustainable Development
- To integrate the Sustainable Development in the training of the students
- To promote a transversely work practices

Service with the thirds

- To integrate the Sustainable Development in the strategy of search and mandates

Participation, communication, information, transparency

- To support and promote the exchanges, the communication and the participation

Working conditions

- The infrastructure must be exemplary
- To sensitize the actors in Sustainable Development

Policies of equality

- To support legality in gender
- To support the multi culturality

Promotion of health and prevention

- To support the wellbeing and the security of students

Question of research and hypothesis

This theoretical base of a "Sustainable University of Art and Design" enables us to put the following mains questions of search:

- Does the HEAD take position to the Sustainable Development?
- Is the HEAD currently in phase with the identified principles of the Sustainable Development?
- Do the managers of the University understand the Sustainable Development concept?
- Is the Sustainable Development trained at the University?
- The university is it exemplary in terms of infrastructures and management?

Following the development of the model of a "Sustainable University of Art and Design" and with the analysis of the state-of-the-art for the grounds of investigation, the research team estimates that search must be validate or cancel on the following hypothesis:

- The university currently doesn't have a position on the principle of Sustainable Development
- There is a different between the concept of the Sustainable Development generally accepted and what make the persons in charge within the framework for their respective courses
- The stakes and opportunities related to the application of the Sustainability principles within a University are not known by the direction
- The Sustainable Development is perceived like an additional constraint and not like an appropriated development

- The management of the infrastructure is not based on the principles of the Sustainable Development
- There is no policy of purchase integrating the notions of the Sustainable Development
- The communication of the good practices is lacunars
- Impacts of flow and consumption is perceived little
- The importance of the role of the education for the Sustainable Development is not perceived
- Complexity is taken little into account in teaching
- The Sustainable Development is perceived like already trained in certain department
- The transdisciplinarity is perceived as a waste of time in glance of other courses

3. Results and experiences

The research team analyzed the validity of the hypothesis with the investigation results and experience. This provided the basis for the specific recommendations in view of a sustainable University.

Institution

Positioning of the University – The University does not have a specific positioning with respect to Sustainable Development; it intends to integrate Sustainable Development, yet without marking it out as a priority.

- To clearly define the positioning of the University.

Prejudice of Sustainable Development – People of the University have very variable levels of knowledge in terms of Sustainable Development. During the focus groups, the majority of the professors requested access to education on Sustainable Development.

- To offer training in Sustainable Development

Opportunity offered by Sustainable Development – It was noted that the lack of information on concrete actions decreases the perception of Sustainable Development. The University does not wish to put Sustainable Development at the centre of its concerns, but there is sensitivity to it.

- To communicate the actions in favour of Sustainable Development

Education of Sustainable Development – There exist no cross vision of the practice in art and design links to sustainability.

- To create a dialogue and research platform to stimulate new visions for sustainable, art and design practices

Sustainable Development, an additional constraint – Because of the short duration of the studies, the majority of actors perceives Sustainable Development as an additional constraint. Sustainable Development is not appreciated as a vision rather than a method or a technique.

- To inform on the concept of Sustainable Development

Management of the infrastructure – It was recorded that the complexity of management is induced by the sharing of competences between two State departments. The university management require a charter, which provide a clear framework in terms of management

- To define a precise charter

Policy of purchase – Cost is the only element currently taken into account for the purchases. The university management also intends to establish a clear policy on this subject.

– To define a precise protocol

Good practice – The use of good practices is already well integrated in the university. The university is not aware of this fact.

– To communicate the actions already in force and to develop them

Management of flows – The device of departments among several buildings dilutes the opportunities. The University is aware that efforts can be carried out in the economy of flows.

– To sensitize the users on the use of flows

Department

Role of teaching – Teaching can be an element in the promotion of Sustainable Development, this concept is not perceived in the university.

– To train the professors in Sustainable Development

Perception of Sustainable Development – The actors of the university do not perceive the complexity and the impact of Sustainable Development. Several people have a false idea of Sustainable Development.

– To promote common knowledge in Sustainable Development

Transversal practice – Transversal courses exist, but their utility is strongly questioned and criticised. The professors do not see the link with the complexity of the society and the need to answer it in a transversely manner.

– To reinforce the programs in progress and to develop acquired knowledge

Work process analyze

The project experience, up from the starting aim to this present final result of the research program, gives a better understanding about the challenge of introducing sustainability in an University of Art and Design.

Sustainable Design R&D is from a bottom up initiative crossed by two different personal engagements on the same place with a similar aim. The meet of this two engagements, create the initial potential for the present project.

The experience exchange with other universities allow to see, that the creation of new places in existing structures – like this research program – is a good opportunity for introducing Sustainability knowledge in a University. Without such a place, ideas and aims would keep silent or isolated and probably never reach a wider public.

The work process of the researchers was conditioned by the moving situation of the university during that time and the quick progression of the sustainability movement. This continues change was a difficult challenge for the researcher, but open them also new opportunities to improve the project. The project took one year longer as previewed – because of the number of participant and timeline casual – but it was the opportunity to helps in the same time actors to familiarizing better with the subject it self.

4. Conclusion

The project Sustainable-Design R&D enlarged the sustainability process, to the different departments and teaching fields of the Design faculty of the Geneva University of Art and Design. The project used a transversally work approach that help to recognize new potentials between the different investigation fields.

The extremely different practices, visions and approaches existing in design, don’t allow sharing properly the project experience with other design departments. That’s why the following

part of the text separates the project experience in university (mission, infrastructure and pedagogic) and education & design.

University – mission, infrastructure & pedagogic

The experience of the research shows, that the most important elements on the way to a sustainable University turns around “human values”, “knowledge” and “pedagogic” and less around technical progression and tools. The role of Universities as an example for good practices in social, economical and environmental responsibility is one of the key recommendations of the research.

A general sighting of the research allows pointing out, that there is no “best practice” in sustainable development, but only good or failed sustainable practices. In competitive systems, best practices are important rhetorical tools to convince actors. The change toward sustainability need to introduce actors in the complexity of their situation, what often faces a rhetorical difficulty.

The analyse shows that all involved actors don’t know what kind of impact they produce through their everyday activities. It is in general difficult to do something better, what we don’t know yet. The sustainable development seeks a balanced contribution to the social, economics and environmental capitals, but the actors don’t know clearly how to split their activities between these three capitals. Those problems also relate to the different sustainability knowledge of each actor, what is largely based on their values and own information sources.

Introducing personal values and ethics in professional or educational activities is not an easy task yet. Most of dialogues with actors show that their values have a secondary place in professional activities in order to protect themselves and their economical income either than a negative social or environmental impact. Convince some one to shift values and ethics refers unfortunately to religion practice or moralistic arguments what is clearly a personal concern. The researcher share the aim to let the transformation take his time in offering an example in good sustainable practice either than convincing actors with Laws and rules.

Knowledge and information can be a powerful ambassador to touch people and provide them new possibilities to act. But today in open information gates like Internet and mass medias, a new learn approach is needed to share the quantity of information. Providing and developing tools and methods to share the complexity and the quick changes we face in a sustainable everyday, is one of the key tasks for a university.

Departments – education & design

The teaching fields in design were the second investigation place of the research project. The experience and results are more specific and don’t allow easily to compare with similar teaching fields in other universities of art and design. In fact the practice in design is extremely large and depends of the actors with their local culture and historical background. The experience shows that the most important elements on the way towards a sustainable teaching and working practice in design, turns around “knowledge”, “project management” and “sustainable solutions”.

Design is probably one of the most open work field in the beginning century. The interdisciplinary work approach of designers embodies a huge potential to develop new sustainable methods and solutions. Many other professions and faculty suffer under high clustered work dogmas, and are prisoner behind their own boundaries. The risk of open boundaries in design practice are the lost of clear professional visions and missions. Especially Design departments with their specialized training should more care about the future of design and their professional integration and contribution.

Many new tools and methods appeared around the design practice during the last 10 years. Especially out of engineering and management fields in connection to life cycles and material stock management. Design departments have to evaluate their potential to give them the right place in the training of design. Especially new management tools have a huge potential to enable Designer to create sustainable products and services in a local scale.

Design history shows that the understanding and interaction of industrial or handcraft production was until thirty years ago an important part of the design project. Today this knowledge could see an important revival on a local scale. In fact local products and services become not only ethical or ecologically desirable, but allows by side the local community to create employments and new local values.

It appears clearly that technologic progression doesn't solve the current development issue. Design professions have a long tradition to refer to new technologies in way to introduce them in the everyday life through products and services. Today where technologies shift progressively to bio and nanotechnologies, designer should definitely put his capacities of planner forward and take a critical distance to emerging technologies to find the right application and scale of them.

More and more universities wish to bring their campus towards sustainability and engaging themselves in signing new network charters to share their aim in networks. Depending the size of University campus, they have specialists or Sustainability task forces to organize and guide the sustainability process. They mostly focus on environmental issues and don't have access to the different faculties. Share work experiences become an increasing need for all sustainability task forces or specialists in Universities all over the world to improve their work process.

Perspective

The general results of the research allows to see that sustainability can become an important ambassador of innovation in design professions and teaching practices in order to set new visions of the possible. Step by step, actor-by-actor, the change needs time to enter in the minds and behaviours of people. Many things can be done to stimulate and accelerate the change of actors in Universities and projects.

The introduction of sustainability in Universities and Faculties depends of new places in existing structures that can act as transversally sustainability platforms. Everywhere where are motivated people, there is a potential to change. Connecting them together independently of their position and accesses to start a movement of change or a process of learning by doing. Experiences from others actors are important references in this change and can bring a better understanding to change managers.

It's not clear yet how the experience of Sustainable Design R&D enters in the practice of the Geneva University of art and design and shows clearly the failing of the research while a temporary and optional platform in the university. The aim of the researchers is about stimulating change toward sustainability, in presenting a multitude of possibilities, ideas and solutions.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

SYSTEMS DESIGN BECOMES EASY LIKE A GAME

A travelling exhibition as a tool to communicate sustainable society

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Abstract

Systems design is a methodology that does not consider production as a linear process, but redraw a map of matter and energy flows representing inputs and outputs of the system.

The characteristics of this method can be transferred to communication process, for spreading a deep ecological thought, intended as Man's consciousness of being part of the net of Nature, not above it.

A systemic communication has been put on trial with the exhibition Innovazione&Design. By activating a system of answers and contributions from the young visitors, this operation wants to put in discussion the current materialistic social paradigm, moving the attention on relations and on the role that every single person has with respect to society and its context.

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Introduction

We are witnessing the growing fragmentation of daily experience and behaviour; we are assailed and overloaded by messages. Our natural tendency to simplify and save energy leads us to deal with this barrage of stimuli and experiences that bombards our lives by schematically grouping and dividing issues into discrete compartments. Our minds activate “short-cuts” in recognising and cataloguing tangible stimuli: these expedients take the name of heuristics, or methods of thought. This mechanism allows us to archive uncritically stimuli by analogy, with similar concepts that we have experienced in the past. Much of commercial advertising builds on these mental references, strengthening the direct connection between stimulus and response. This is why references to technology bring to mind almost exclusively electronic goods and sophisticated instruments, and why we think of fashion and the world of art when mention is made of aesthetics. The stronger these ties are, the more difficult it is to break them, which is why it is so difficult to recognise a butterfly's wings as technological, or the movement of a pendulum as beautiful.

There is an infinity of ways to establish a relationship between two elements. The most immediate way is determined by experience and habit, though alternative ways also exist, which are all the more fascinating, as they question conventional logics by establishing a connection between remote associates, or apparently distant or conflictual elements. This experience of novelty can be found in the creative and design fields, though it can also be observed in everyday life, when we laugh, for instance, at a joke: retracing the mental pathway that led to the final punch-line, we see a perfectly logical pattern which we previously would never have followed.

Looking at issues from a different perspective, and picking out unconventional logical pathways, is the real meaning of innovation, which unfortunately though is often confused and reduced merely to the technological sphere.

Individual existence, just like our collective and global existence, manifests itself as a web of relationships, in which interconnection and interdependence predominate. The question is how we can translate this intrinsic diversity into a methodology for communication.

Communication and learning

The mechanisms of traditional classroom learning are based on the linear transmission of the message. The model involves a source who encodes the message – that is, who transforms thought into a form of communication; the message is then received by a receiver who decodes the message – that is, who transforms meaning into thought.

The model has evolved over time with the introduction of contextual aspects and the defining characteristics of the three elements (source > message >receiver). A return loop may be added to this otherwise one-way transmission of information, which we call feedback.

A recent development in the mechanisms of traditional classroom learning has come from the introduction of distance learning tools (e-learning). With the physical absence of the teacher, teaching methods that exploit multimedia, interaction and the Web have had to be developed. Multimedia teaching standards are based on a block-by-block structure of "learning objects,” in which lessons are structured into chapters, with assessment tests proposed at the end of each chapter. One of the research projects at the Politecnico di Torino is aimed at strengthening the learning object. Through a systemic approach, the principles of sharing and autopoiesis are explored, giving students the opportunity to contribute to enriching lesson content, while the relationship between the issues addressed in different chapters are stressed, opening up the possibility of building a learning programme which is not tied to the linear organisation of chapters,

by exploiting the programming languages intrinsic to the Web 2.0, such as podcasts, wikies, and share tools.

Whether the tools used are virtual or real, it is not hard to gather that the most effective way to learn a concept is to put it into practice. The designer Enzo Mari describes learning as the alternation of two moments, which he calls HARD and SOFT phases. The HARD phase represents the cognitive, or knowledge process, in which information codified by others is acquired: for example, when you learn to play a musical instrument through solfeggio. The SOFT phase is the experience of know-how, that is, putting knowledge into practice: following our musical analogy, it means practising the instrument.

Schools traditionally privilege the HARD phase of learning over the SOFT phase. Recently, however, even in Italy, school gardens have begun to be planted, where SOFT phase learning consists of students directly experimenting with and managing natural plant cycles, so as to understand the concepts of growth and development.

Multidisciplinarity as a tool

Alongside communication and learning techniques, the systemic methodology builds on concepts from more remote disciplines, such as complexity theory and psychology.

IT is interesting to see how scientific method approaches reality in an abstract, numeric way, but the rules and characteristics that emerge can be described perfectly in concrete and qualitative terms, which are applicable even to design and communication projects. Indeed, complexity theory in physics and mathematics does not aim to find a solution to problems that cannot be explained through other methods; rather, it describes an approach through which problems can be addressed. While classical physics and linear mathematics describe models that can be reproduced and formulae that produce a single result, the complexity approach provides as its outcome structures, trends, and cycles, whose numerical values cannot be measured because they depend on factors that are not measurable.

A brief description is necessary of the levels of complexity which scientific research comes up against, as is an understanding of why they deserve our attention. Numerous degrees of complexity exist: simple, unorganised complexity can be found in many physical and chemical phenomena, such as in boiling water and atmospheric agents; organised complexity is typical of living systems, such as cells, where each individual component influences the whole system.

A higher degree of complexity can be found in socio-cultural systems. When humans become components of such a system, they bring with them a baggage of rules and behaviours that cannot even be represented, as the capacity for judgement, self-consciousness, and the free will of people influence the broader system in a highly non-linear way. Complexity thus becomes organised and teleological.

IT is also curious to see how humans, the most complex organisms in nature, find it so difficult to understand complexity, as we tend to reduce phenomena to a simple cause and effect mechanism. In this way, the characteristics of complex systems become a very useful tool for understanding and addressing socio-cultural issues. One of these characteristics is dynamic equilibrium. Just as fixedness and the absence of change are symptoms of death in nature, human social activity unfolds in a non-constant way, characterised by fluctuations and cycles which repeat themselves, while overall development remains in equilibrium. Another characteristic of human social activity is interdependence: each of the parts of a system stands in relationship to the others, and hence is capable of both influencing, and being influence by, the context. The properties of self-organisation emerge from this characteristic, placing open complex systems in a position to control and regulate themselves. Self-regulation is also made possible by feedback mechanisms, or loops. Such feedback loops began to be understood and developed with the advent of cybernetics, in particular by Norbert Wiener, who observed how the elements of a system form a loop, in which an initial cause is propagated and acts on each of the individual

elements in a cyclical way. The consequence of such an arrangement is that the original input is affected by the final output, resulting in the self-regulation of the entire system as the initial effect is modified each time it completes a full cycle (Capra 1996, 65).

Psychology is another discipline that can lend much useful insight into motivation and emotional involvement during communication phases. Attention levels rise when certain factors are brought into play, such as personal relevance, values, needs, abilities, and the opportunities perceived by the receiver. In short, planning any sort of communication effectively requires an in-depth understanding of the target audience, and the context in which the message will be set.

The broken windows theory can help us understand how behavioural choices by the target audience do not come solely from personal will, but are strongly influenced by context.

“Broken Windows was the brainchild of the criminologists James Q. Wilson and George Kelling. Wilson and Kelling argued that crime is the inevitable result of disorder. If a window is broken and left unrepaired, people walking by will conclude that no one cares and no one is in charge. Soon, more windows will be broken, and the sense of anarchy will spread from the building to the street on which it faces, sending a signal that anything goes. In a city, relatively minor problems like graffiti, public disorder, and aggressive panhandling, they write, are all the equivalent of broken windows, invitations to more serious crimes” (M. Gladwell, 2006).

This epidemic theory of crime can be compared positively to awareness of environmental issues, in which we do not act regularly but a line of behaviour is established.

Systemic Communication

The aim is not to question academic methods and education in a classical sense, but rather to ease the implementation of the difficult role taken on by those who wish to address issues concerning everyday behaviour and habits, through the introduction of a new tool.

The goal of systemic communication is to identify an approach in which the message conveyed is not only received and understood by the receiver, but in which the receiver is sufficiently involved, so as to become a vehicle of communication for others. This can happen where the communication project takes into overriding consideration the public being addressed, offering stimuli and concepts which do not have a closed meaning, but rather can be interpreted, discussed, reworked and questioned. In this way, communication targets participate in the formulation of the message, widening the discussion beyond the strict context in which the message was launched.

The Innovazione&Design Exibition

Open communication emerged from the need to build a tool to compare the research experiences of the Department of Architectural and Industrial Design (DIPRADI) and the Industrial Design Course at the Politecnico di Torino in the field of environmental sustainability, with those of other entities external to the university, in an effort to “test the waters” and gauge general attitudes towards environmental issues. Backed by experience gained through the application of systems design to industry, and the theoretical context outlined above, we decided to address the issue through a travelling show & workshop called Innovation & Design, promoted by Regione Piemonte, visiting primary, junior-high, and senior-high schools.

It is well known that our minds are most sensitive to external conditioning during our schooling years. It is then that we go through the process of developing sensible perception, before developing the personality that accompanies each and every one of us throughout our lives. At schooling age, we are particularly susceptible to the mentality dominating the environment in which we grow up, and we are inevitably conditioned by it.

Thanks to a capacity to understand abstract issues and a certain elasticity of thought, kids are the best audience when it comes to talking about innovation issues – without forgetting that it will be the choices of our young people today that will shape society tomorrow.

More importantly than how a topic should be presented, it is fundamental to plan what to go and say.

The issue of sustainability today has been addressed from a number of different points of view. The majority of these points of view focus on the environmental awareness of receivers. Such a strategy, however, is not always effective, as quite paradoxically, ecological issues are not always perceived as a problem that concerns us.

Raising sensitivity towards the problem is one of the goals that the show aims to achieve, because attitudes towards an issue which we know exists are very different to attitudes towards a problem which we feel affects us.

As such, understanding and interpreting the show is something left up to the kids themselves. They are presented with two scenarios which draw out aspects of behaviour, lifestyle and design from two different perspectives: one focuses on the Product, the other on Human being.

Concepts are then extrapolated from each of these two starting points, expressed as keywords which draw out a map of values, with each word placed closer to or further from the centre on the basis of its importance.

A Comparison of Two Paradigms of Thought

Each scenario is contained within an aluminium structure, four metres high by three metres wide. The map of values is represented on the ground, with posters positioned in correspondence to the keywords, presenting images to clarify the concepts.

The first difference between the two structures is in their colour. The Product scenario is yellow: a bright colour evoking vivacity and euphoria, but which can also be annoying or ambiguous, or as in the words of the film director and writer Derek Jarman, “a vision of evil, it is the sign of Judas. When yellow seeks to seduce, it becomes gold.” The Human being scenario, on the other hand, is blue, a calming, thoughtful, spiritual colour, or in the words of Derek Jarman, “I present you with the universal Blue/Blue and open door to soul/An infinite possibility/Becoming tangible.”

Near its centre, the Product scenario has keywords such as 'raw material', upon which the very existence of a product depends, 'economic value', 'ownership', 'status symbol', 'marketing', 'visual packaging' and 'communication'. These aspects refer to the commercial sphere of design, highlighting how seduction and product appeal are fundamental elements of the system. The Product must, first and foremost, enter the mind. One step down we have values which refer to the product process, in particular 'engineering', 'production' and 'logistics'. Further away we have the phase concerning the use of the product, identified by the keywords 'use function' and 'components', which acquire importance when the problem of maintenance arises. Finally, the keywords on the outskirts of the map represent the needs to be addressed once all the previous requirements are met, and when a product loses its seductive and functional value, such as 'life cycle', 'ecology', 'pollution', and 'environment'.

This scenario can be understood as a contemporary snapshot of our society, not only from the point of view of designers, bearing in mind that the manufacturing of products both influences, and is influenced by, the social context.

What would happen though if the central paradigm of our society shifted from the Product to Human being?

The change in point of view means changing our value system, restoring importance to notions such as 'biological, social and ethical life', 'respect', 'relationships', and 'real existence'. Alongside these keywords we have tangible aspects such as 'perception', 'ergonomics', and 'functionality'. Only on the outskirts of the map do we have concepts tied to 'production', 'the economy', and 'economic value'. There is, of course, no denying the presence of the product, and the associated concepts of 'logistics' and 'engineering', however they are considered of lesser importance than the rest.

One might wonder why references to ecology, recycling and sustainability are absent in the Human being perspective. At a first glance, we might expect that these marginal concepts from the Product point of view should become central when we shift perspective. If this were so, however, we would not have moved very far from our current focus on goods, as solutions for the disposal, recycling, and incineration of waste are downstream measures which are costly commitments for companies, just as project guidelines for the reduction of materials use and energy efficiency represent limitations. Furthermore, it has been seen that these solutions do not actually change consumption habits. When problems arise in the management of solid urban waste, local administrations generally choose to build new dumps, incinerators and compost plants, forgetting the importance of encouraging the community and business to reduce waste production itself.

In formulating the Human being paradigm, reference was made to a world view that does not separate human society from the natural world. If we consider the planet as an infinite mine of resources at the disposal of humans, and at the same time a waste dump without end, we remained locked in the Product paradigm, in which raw materials have central importance. Alternatively, if we consider the planet a web of open systems in which life conditions, and is conditioned by, the context, the emphasis is no longer on raw materials and waste, but rather on inputs and outputs. From this point of view, the waste output by the system can become the input of another system, promoting a virtuous productive and economic cycle.

Hence, it is not true that the aspects of environmental sustainability disappear; instead, they become implicit to the paradigm when Human beings are considered an integral part of nature.

We have always put ourselves in a privileged position when it comes to the reality that surrounds us, imposing our rules and shaping the territory to our pleasure. The evolutionary success of the human race has arguably arrived at a turning point, as we begin to feel threatened by the very lifestyle and well-being that our forebears so tirelessly worked towards. We need to act to change our habits and shift our perspective, without, however, turning back; the evolutionary process has to continue.

Perhaps in future years, the attitudes that we consider 'natural' today might come to be seen as abominable, not only those concerning our planet, but also our attitudes towards the weak and disadvantaged. Radical changes in paradigm have already occurred in the past, as Aldo Schiavone points out happened with slavery: a practice that we have unanimously judged to be degrading for less than two centuries had, until yesterday, a long, noble history in thought – from Aristotle to the Confederate publicist during the American Civil War, slavery was considered a typically “natural” institution, with no objections ever raised by the Christian churches. [...] IT happened with the condition of women, branded “naturally” inferior to men by a tradition of no less importance, and which remained by and large unchallenged until the first half of the twentieth century.

What are the prevailing labour conditions today in developing countries, and above all, who has benefited from development?

The keywords 'ethical life', 'respect', and 'real existence' seek to focus attention on these contradictions, and on how our everyday choices can influence apparently remote systems.

This arrangement of keywords and their meaning is not made directly explicit in the show, as otherwise visitors would not become fully involved, limiting themselves to either sharing or rejecting an interpretation given by others. Rather, visitors are left to freely interpret the panels and the relationship between them. The exhibition needs to be explored and lived in order to be understood: indeed, from the outside, the most evident images are the keywords on the outskirts of the maps, giving a superficial view of the issue. For instance, the concepts of 'ecology' and 'environment' are highly visible as one approaches the Product paradigm, though upon entering and moving closer to the centre, the visitor understands that real importance is held by other factors.

Placing Humans at the centre of the project is by no means a new or revolutionary concept – indeed it is quite natural to take it for granted, or even as anachronistic. In reality, for almost two hundred years now, human activity has become so focused on industrial production that it has absorbed its rules and rhythms. In his book *The Third Wave*, Alvin Toffler highlights the five principles that make industry efficient, which have been transferred to society as a whole. These principles are: standardisation; specialisation; synchronisation; maximisation; and centralisation. Without going into each principle individually, it might be said that an assembly line organisation and cyclical rhythms have transformed daily existence into a continuous race against time. Creativity, time spent with the family, and gratifying work are values which we have yet to recover fully from the end of the industrial wave, which, as we know, was strongly product-oriented.

A Network of Knowledge

The show was inaugurated in September 2007, and will be hosted in primary, junior-high and senior-high schools throughout Piemonte until the end of the academic year.

The physical structures are just the starting point for discussion with the kids. The show represents an example of applied systemic communication, as it is able to make use of a multitude of expressive forms, technologies, and communities, which broaden the network of information and opinions.

The images collected come from various different sources. Some of the photographs were taken by researchers from the Department involved in the project, while others were found on web sites dedicated to photography. In this way, specific situations experienced first hand along with choices made by others have been documented, reflecting very precisely the concepts expressed on the various panels.

Photographs from the Web were taken through the system of Creative Commons licences. This represents an example of how the difficult question of copyright can be managed, placing Humans at the centre of the project. Creative Commons are a collection of licences that set forth the rights reserved by authors over their works. The works can be freely distributed providing that they are acknowledged using the terms selected by the author and other restrictions, such as the non-commercial use of the works, the ban on modifying the works, and other specific indications that can be found on the website www.creativecommons.it.

The show's colophon lists the names of the authors whose works are used. This solution enabled us to make use of high quality photographs with a view to establishing reciprocal respect and relationships – two central values from the Human point of view.

While the kids are free to roam among the structures, the show also involves a presentation of the issues at schools and direct exchange with lecturers, researchers and students from the university. The aim of the presentation is to introduce the issues addressed by the show, through metaphors and analogies which shed light on this critical turning point in history that we are living through, namely the energy and commodity crisis, with the help of images, cartoons and suggestions. Of course the depth of the discussion is adapted to the age of the audience.

After the kick off presentation and a visit to the show, the kids are invited to express and work out their views, and give their impressions as feedback. A number of different tools are used to encourage feedback, though the kids are left free to express themselves as they wish.

One way to give comments is through Post-it notes, which can be left directly on the images displayed on the panels. These brief thoughts are a useful way to break the ice, as they are informal in nature, often quite out of place or ironic, and they can be read by everybody.

Other forms of interaction are established through a written questionnaire and a video box. The questions asked concern the kids' daily habits with regard to diet, travel, and sense of involvement in the issue. The kids are always questioned in an informal way so as to encourage sincerity.

For primary school pupils, the map of the two scenarios has been printed on paper, with a description of a pathway to follow through the panels, and a brief description, involving questions, of the meaning of the keywords.

Under the guidance of teachers, or independently, as the case may be, in the days following the presentation, kids are encouraged to produce reflective material, which can be represented in any way, and on any sort of support, from MP3 files to printed T-shirts.

A web portal at the address http.innovazionedesign.top-ix.it is also available, where the kids can upload electronic material, images, and videos, revisit the show, and share their observations with pupils from all the schools involved in the project.

The time the kids dedicate to the show is very different from the time they spend in the classroom, as they do not have to interact necessarily with teachers, and they have the opportunity of using tools and techniques similar to those used in entertainment. This encourages the spontaneous creation of networks which extend well beyond the classroom, to involve parents and friends.

The communication project is further enriched by the feedback that emerges every week when meeting the class groups, so it might be said that the project is a process of development, continuously updated, and perhaps soon it will be able to continue independently.

An exhibition to be held the Natural Science Museum in Torino, from 22nd September to 21st October, will represent an initial opportunity to organise all the material produced by the school pupils and present it to an audience beyond the schooling system. The exhibition will be an occasion to see the pathway followed, though as was the case for the pupils, visitors will be expected to participate in the event in a critical way.

Obviously, if the project does manage to shift our social paradigm, its effects will only be seen in the medium-to-long term.

The first results to have emerged from work with the pupils and the discussions held paint a rather worrying picture, as although it would seem they are aware of and sensitive to environmental issues, few of the individuals seem willing to question or change their lifestyles. It would appear that a change in paradigm cannot happen immediately, but needs time to become widespread, shared and metabolised. The somewhat disappointing reaction of the kids can only confirm the need for change.

In December 1987, the UN World Commission on Environment and Development spoke of sustainable development as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” This definition, which over the years has been modified, does not offer solutions but urges us to put Humans at the centre of attention. Nevertheless, responsibility has not been shared and put into practice by everybody, as the road to sustainability involves bans, obligations, regulations and additional costs, for both companies and individuals.

The systemic approach has already provided examples of how to apply the principles of sustainability by promoting economy and culture. Systemic communication is the key tool in disseminating this culture, and encouraging future generations to take greater responsibility in an effective and spontaneous way.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The emergence of shamanic wisdom in the culture of the modern Brazilian project

The perspective of a new rationality for design

Rosane Costa Badan[1]

Abstract

The Brazilian contemporary designers develop their projects within a rationality that is magic. This thought does not have the same parameters that define the logic of Western scientific thought. By a vision that comes from above, they work in a dimension that transcends the rational and sensory exploring the world through free associations of elements.

The aim of this paper consists in bringing to light one of the logics that does not belong to the West. The shamanic logic of Amazon indigenous tribes plays the role of this rationality.

The main goal is to provide a new reading key to the contemporary designer, which could help him to overcome the limits of materiality, giving him the possibility to renew the energies of the current design.

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1. Introduction

Contemporaneousness as a whole finds itself systematized within a peculiar dynamics and is therefore subject to continuous renovation. It tends to fluidify diverse logics of thought and creates hybrid and intermediary typologies among the various projectual scales. Designers are conscious of such a dynamics and thus move transversally among the many areas of knowledge. This offers them the advantage of appreciating a wide range of known realities and at the same time favors the exploration of other intellectualities that are structured differently from that of the West. Given the fact that there are various logics which rule the different languages responsible for the dichotomies in the world, the aim of this paper consists in bringing to light one of the logics that does not belong to the West in order to renew the energies of present-day design.

The shamanic logic of Amazon indigenous tribes plays the role of this relatively unexplored intellectuality. It is a mentality inherent in the way of thinking of Brazilian contemporary designers. The latter develop their projects within a rationality which is interpreted as magic. This rationality lacks the parameters that define the logic of Western scientific thought because it is developed on deep levels of perception and sensation.[2] In order to understand its parameters, the most adequate measure consisted in making present-day humanity look towards and follow the rising trajectory of a parabolic curve whose climax was the magic within shamanic traditions.

Within an indigenous society, shamanic logic suggests means, broadens the virtues of things, predicts effects, and fully satisfies the common wishes of an entire generation. Shamanic wisdom[3] transcends the limits of the Western worldview - which is ordered, stable, fixed - and provides resources for man to reach complex immaterial, expressive, and communicative horizons that make up an essential panorama of his survival.[4] Although shamanic and Western views differ, it cannot be denied that humanity also admits this type of rationality which is capable of overcoming the limitations of materialist science. It is, indeed, a decontaminated body of knowledge that is apt to reconcile man with Nature. A new reading key such as this may aid the contemporary designer to surpass the limits imposed by habitual materiality directions.

2. The shamanic perspective

Shamanism is not a primitive stage of religion, but a highly elaborate state of conscience and a key that human beings developed in order to comprehend the environment and to live in harmony with it (Drouot 2001, 23). Western civilization has longed to live harmonically with Nature, a return which valorizes the instinctive feature of man and gives him the possibility of integration with the whole. Certainly such a feeling of unity with existence may be reached, but it is necessary to renounce the illusion that Western thought occupies a central or preeminent place in the world. Once this perspective is kept in mind, the starting point consists in turning away from the West and penetrating the wisdom of shamanic traditions. Studying shamanism is the same as recovering the roots of human knowledge: it is the most ancient spiritual and cognitive tradition on record, one which is still present among the indigenous populations of all five continents.

Shamanic wisdom is disinterested and is structured within an intellectual way of thinking.[5] Such thought is integrated in an indivisible whole and is based on the principle which states that if one fails to understand all, nothing can be explained. This totalitarian ambition of wild mentality

[2] Sensation is the answer given by sensorial receptors and sense organs to environmental stimuli, whereas perception includes the recognition and interpretation of sensorial information (Rookes 2002, 17).
[3] The secret of shamanic wisdom resides in its access to non-ordinary states of conscience.
[4] If in the past man's proximity to Nature served as a standard to all of his actions, nowadays reestablishing closer ties between Nature and Humanity is the ensurance of human existence (Papanek 1995, 11).
[5] An intellectual way of thinking does not equate to a scientific way of thinking (Lévi-Strauss 2007, 22).

constitutes an immense challenge to the system of beliefs of modern science.[6] Whereas scientific knowledge is characterized by a rational logic that demands integral transparency to reality, wild knowledge possesses a magic mentality that intends to be incorporated to reality, a certain human density.

Magical mentality attributes great importance to knowledge and is dedicated to knowing Nature. According to indigenous shamanism, magic is essentially an art of doing which is capable of producing anything non-conventional. However, only that which was in fact believed in by an entire society is regarded as magical, not that which was defined as such by a fraction of this given society. Acts which are not repeated would not be magical; acts whose efficacy is not believed in by the entire group would not be magical; strictly individual acts cannot be called magical. The collective prevails over the individual despite the fact that magic is an isolated practice, mysterious and fortuitous, dispersed and fragmentary, arbitrary and facultative.[7] In fact, magic does nothing or almost nothing, but it makes one believe in everything, so much so that it puts collective forces and ideas at the service of individual imagination. As a complexion, magic is made up of acts, representatives, and agents: magical rites are known as acts;[8] ideas and beliefs that correspond to magical acts are known as magical representations; agents are known as shamans, the individuals who execute magical acts.

Shamans are distinguished in tribal societies as doctors, musicians and dancers, poets and story-tellers, painters and craftsmen, guardians of myths and mediators of conflicts within the community. They are also sophisticated experts in minerals, vegetables, and animals, as well as experienced travelers of the paths of the material and spiritual worlds. This communication between both worlds occurs thanks to the disposition of the universe which is generally conceived in three or four layers. A shaman seeks to be in communion with nature, not in control of it.

3. The shamanic universe and the cosmology of Brazilian design

I researched the Amazonian[9] indigenous cosmology and confronted it with the roots of the modern project in Brazil. My aim consisted in identifying the influence of shamanic thought over the mentality of the contemporary designer or in finding out whether any relation existed between shamanism and design.[10] I became aware of a correspondence between these two contexts by

[6] Contemporary science heads in the direction of overcoming this schasm. In 1986, during a summit in Venice, a written declaration stated that science and spiritual traditions are complementary, not contradictory. According to the Venice declaration there exists a new rationalism capable of overcoming the limitations imposed by materialist science and by institutionalized spirituality and of reconciling humanity with nature. It is possible to recover the link between spirit and matter which is embodied in traditional bodies of knowledge (Arantes 2005, 15-7).

[7] A magical ceremony does not occur inside a temple or on domestic altars; normally it is performed in woods – away from houses – at night and in the shadows. It is hidden even when it is licit. Even when it is forced to act in front of an audicence the magician seeks refuge; his gesture is fortuitous, his word indistinct (Mauss 2000, 18).

[8] A magical rite is normally irregular, abnormal, and dictated by necessity, not by moral obligation. Mauss named 'magical rite' each rite that is not part of an organized cult: it is private, secret, mysterious, and tends to the limit and the forbidden. Magic was not defined by the form of rites but by the conditions in which these are produced and by the place they occupy in society (Mauss 2000,19).

[9] Shamanic cosmology reveals that the universe is made up of three levels – the sky, the earth, and the subterranean world – which are linked by a central axis (Eliade 2002, 287). Below the earth's layers are the aquatic and the subterranean worlds: the former is related to aspects of creation and transformation and the latter is related to cannibalism; earth is the place of hunting whereas the sky is the world of the sun, the moon, and the stars. Each of these worlds has an ancestral anaconda which rules and represents them: the anaconda in the water, the jaguar on earth, and the harpy eagle in the sky. Shamanic wisdom and technique concern the ways of dislocating from one world to the other. The passage is represented by an opening or a hole through which sublime creatures or guardian animals of these worlds pass.

[10] The origin of Brazilian design can be traced back to European and indigenous cultures. As regards the European culture, aesthetic axioms originated from rationalist vanguard currents. As regards the indigenous culture, the principle of primitivism tended to an aesthetics of balance thanks to a system of assimilation between native culture, intellectual culture, and technology. Such elements were articulated within a syncretic cultural concept in which formal innovations promoted by "native originality" were conciliated with the universal demands of the modern spirit. Therefore some theoretical models elaborated in Europe influenced the culture of the

establishing a reading based on an artistic-intuitive reflection. This reflection produced conclusive considerations regarding the evolutionary process of Brazilian design. They indicated that this relation had a symbiotic aspect and involved a universe which was structured within European and autochthonous parameters as well as another universe structured on cosmological parameters perceived by the shamans of Amazon tribes (Badan 2007).

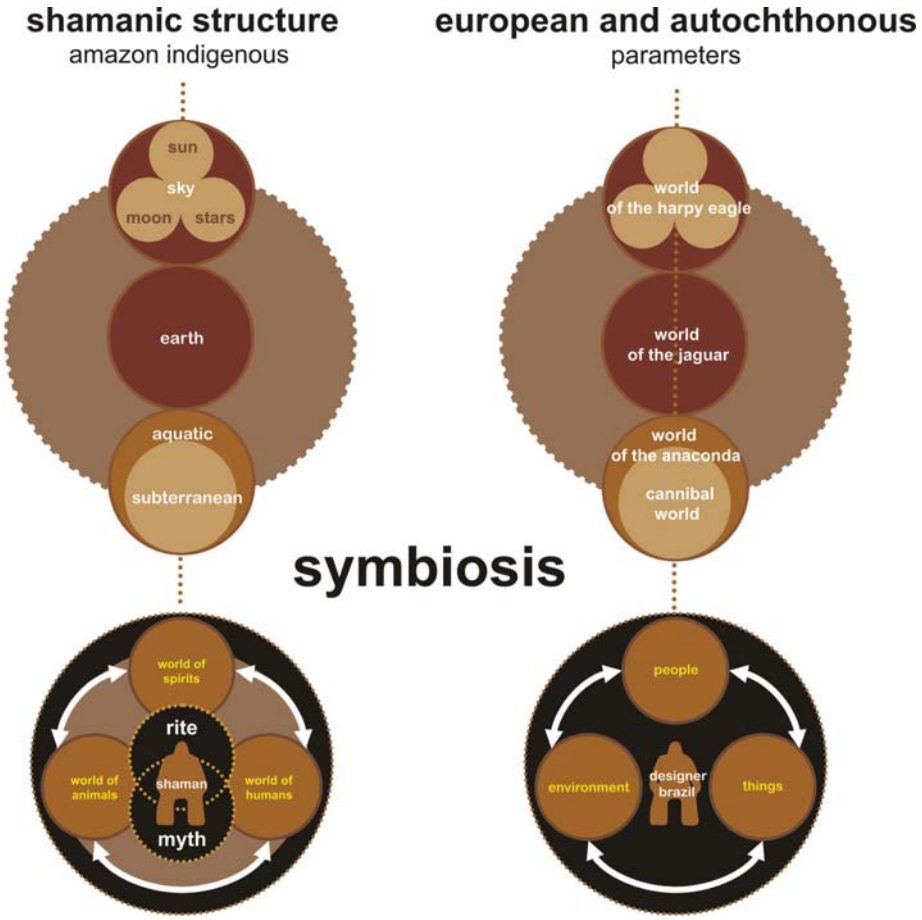

Fig. 1: The evolutionary process of Brazilian design reveals a symbiosis between the universe that was created from these two parameters – European and autochthonous – and the structure of the universe perceived by the shamans of Amazon indigenous tribes.

In order to understand this symbiosis, the structure of the universe of Brazilian design was aligned in a scheme made up of four specific worlds (Fig. 1). In the proposed scheme, the ideas congregated in each of these worlds failed to come together in terms of chronological aspects. What did bring them together were the aspects of identity and affinities which were verified, first of all, in the process of intellectual development of designers. The identity inherent to each world presupposed the persistence of a single knot, be it in the project, in the methodological coherence, or even as an acknowledgement of certain symbolic characterizing attributes.

Meanwhile, of the four worlds identified, the one to which I referred as the world of the harpy eagle revealed an intense correlation with magical or supernatural manifestations originating from the Amazonian shamanic cosmology. The designers of this world employ intuitivity and experimentation in order to carry out three basic actions within the projectual process: to recycle the things of nature, to reuse already used materials, and to recontextualize low-cost industrialized products.

Brazilian project in the same way that the image of tropical nature became the scenario and background of many modern design projects (De Moraes 2006, 6).

Eventually, in order to carry out their activities, shamans and designers decompose and recompose the world they know by exploring it through free associations of elements. By regarding experience as a direct perceptual contact with that which presents itself to mental faculties such as perception, memory, imagination, and introspection, both shamans and designers work within a dimension that transcends the rational and the sensorial[11]. By means of a top-down vision they juxtapose explored fragments and create new structures with new meanings.[12]

Having observed the development of these actions, I assumed that there were two elementary principles which established an interdependence between both universes: experimentation and contiguity (Badan 2008). The former is a principle which indicates a means of creation and makes explicit a risk of failure that allows one to recreate new things. As for contiguity, it is a principle that functions as a link between differences, allowing new relations to be created and new meanings to be produced, both for things and for beings (Gonçalves 2001, 33-4). According to shamanic theories regarding the Cosmos – all of which reveal that all things must be linked as parts of a unified universe – contiguity materializes through experimentation. Once I examined the phenomenon in greater detail, I concluded that there existed a dynamic confusion involving powers and competences within the regular state of this system (which is, in fact, magical). Each experimented thing was done so in a singular manner and each of these experiences differed in their descriptions.[13]

With the insertion of these principles in indigenous culture as well as in the culture of the Brazilian modern project, if the indigenous culture is to be valued first and foremost, several are the reports of anthropologists indicating that experimentation and contiguity support the existence of a fundamental interconnection that reunites all the parts of the unity. In this case, to experiment is the concept that reveals the possibility of transformation and continuous creation of elements that make up the Cosmos. Such a transformation is regarded from peculiar indigenous ways of producing transformation.[14] Native theories are concentrated around actions responsible for the metamorphosis that allows the transmutation to another body. If the same principles are subsequently transferred to design they may be interpreted as projectual phases of a non-conventional process constituted by the fusion of trivial elements and technological components, in other words, as phases of a top-down elaboration of products. Here the transformation does not equate to transmutation but to subversion:[15] fragments had their original function subverted so they could be used in a different context.

As a result of such dynamics, a few of the elements that were previously set in the material scenario of the two cultures "apparently" disappear without modifying the character of the final result. If such an analysis is correct, in essence, then shamans and designers – despite originating from different cultures – have developed an analogous way to arrange their universes and to act upon their worlds. Under a feature regarded as magical, both benefit from the same creative ability: more than simply perceiving connections between things and beings, they are capable of modifying the original context by recontextualizing it.

4. The aesthetic redimensioning of design in Brazil

The perspective of recontextualization has led the contemporary designer towards a vision that goes beyond the rationalist notions developed in the Western world. This new vision is based

[11] In a primary sense experience is linked to sensations and perception; sometimes illusions and hallucination are also regarded as experiences. In a tertiary sense experiences reveal a mystical basis.

[12] Intellectual assemblage results from concepts which originated in the European vanguard of the early 20th century, such as the pure vision of Cubism (synthesis, montage, and technical finish), the wireless imagination of Futurism, the irrationalism of Dadaism, and the free association of Surrealism (Teles 2002, 81-3).

[13] Experience is a mental state of an individual and reveals its own nature and way of being.

[14] The indigenous transformational tradition derives from appropriation. This means that the opening is not produced by autochthonous innovation but by exogenous appropriation – the innovation is allopoietic (Gordon 2006, 29).

[15] Subversion is here interpreted in its aesthetic sense (novelty, innovation), not in its dialectic sense.

on a juxtaposition of fragments which in turn is correlated with a reality of design mainly manifested in Brazil from the 1990s onwards. At this time, accelerated globalization contributed to the formation of a large group of professionals who acted in the Brazilian market at their own account by practising a deterritorialized production. Many of them did not have sufficient money to afford complex tools or to create their products. Such technical precariety caused these designers to carry out studies on language whose parameters surpassed functional requisites and to appeal to the use of preexisting objects. By taking advantage of their forms and colours they performed operations that would transform objects in components. Consequently, these difficulties propelled the formation of forces that innovated Brazilian design (Leon 2005, 16).

Fig. 2: Once the original matter is transferred from its natural habitat the spectral character of the world of objects is dismantled in an experimental kaleidoscope; after its reassembly, it is reverted into an allegory within a context of revalorization.

However, the act of transforming objects in components did not signify the construction of a unique language; on the contrary, the intellectual approach of superposition of elements redimensioned the aesthetic and conceptual structure of design in Brazil. The latter was no longer interpreted as a result of simple European influences or as an adaptation of preexisting codes or styles. In fact, such redimensioning was a result of a process based on shamanic principles which, by inscribing and reinscribing imagetic or cultural meanings that are non-contaminated by other languages, have promoted a new reading to objects and raw materials of daily life.

As previously indicated, these features are easily verified when various elements from a given culture are juxtaposed. This juxtaposition alters the meaning of the matter by removing it from its natural habitat and placing it in a context that doesn't belong to it (Fig. 2). By assuming

different values to those related to the preceding context the limits of comprehension linked to the new materiality emerge and are immediately surpassed, whereas the values of its fragments assume a secondary position. As expected, the recontextualization does not cancel or hide anything; it leads to the emergence of a new structure, one which is ambiguously organized by reverting the values of fragments into allegory within a context of revalorization.

If my aim consists in understanding this context more deeply, then it is necessary to extract the essence of the recontextualized object and to examine it in terms of its insertion in the cultural and social matrix in which it was developed. As far as the indigenous matrix is concerned, for instance, it is important to highlight that all magical experiences are integrated and form a real whole. The unity of the whole is more concrete than any of the isolated parts. It is not difficult to imagine that, if this same analysis had been produced within the western matrix only, each portion of this whole would have the tendency to be abstracted. However, in the context of recontextualization, the parts lose the ability to communicate their truths if analyzed on their own because, within this context, they only make sense and become necessary if essentially united. In the process of juxtaposition of fragments, the individual identification of each of the parts tends to disappear in order to reveal a visual condensation of the whole. When the whole is examined in its entirety one perceives that this object is loaded with an immateriality in its complexity, with a spiritual value that is completely different from that which formerly belonged only to its parts. It is important to point out that, as regards subversion, the original matter – in the role of components - is still easily identified in the recontextualized product; however, because of the fact that this product is submitted to diverse cultural channels, it is open to the manifestation of different emotional impacts. In fact, the transgression of the original matter incites the spectator to carry out a new reading of the object which, in turn, will lead him to express an unexpected emotion translated as mystical or magical.

For the Amazonian cosmology - whose thought is participative, mythical, symbolic, and above all emotional – emotion is a sensation analogous to all objects. Such objects reveal that Indians live in a world rich with sensations. Each object represents an integrated reality with which affectionate relations are established, therefore it is loaded with potentialities that arouse emotion. Nevertheless, in design, these are sensations which do not occur with any object, utensile, or created artefact. The energies of the designer are often turned solely to visual qualities, leaving other sensorial components out of the final project. For this reason the spectator's reaction is strictly limited to the contemplation of the present materiality. It is true that the spiritual value of a product depends on the intention of the professional who created it and on the respective use to which it is assigned. However, few objects are able to attain a projectual intentionality capable of uniting all sensorial qualities and which may imply a sacrality, in other words, an intentionality capable of involving the spectator's mental and muscular effort in the "reading" of its structure.

Synesthesic reactions serve to manipulate perception and emotion. However, emotional reactions rely on several other factors. It is clear that the designer's intention is important, but not less so than the components used. Similarly, the components are as important as the final product just as the final product is as important as the context to which it is assigned. To allow all these elements to contradict each other – failing to work in harmony - in all their extension with the aim of creating an ambiguous though permutational game may release unexpected emotions, transcendental sensations, and suggestions of the sacred in people. This ambiguous game allows the development of ludic behaviours in the minds of spectators. Ambiguity[16] is the place where the expression of thought, language, and image meet, as well as the place where art, design, and sciences converse with each other.[17] From this point of view the aesthetic

[16] Even though ambiguity may be regarded as the coexistence or confluence of two incompatible aspects of a single reality, the presence of a double meaning for things is not a negative aspect; on the contrary, it enables a total understanding of this reality.
[17] The man-artist and the man-scientist employ their own language when manifesting their peculiar thought: the language of the artist is normally synthetic, smoky, instinctive, and understandable, whereas the language of the scientist is more analytical, precise, rational, and obscure. However, in the dimension where science and arts meet, language becomes at once analytical and synthetic, precise and smoky, rational and instinctive, understandable and obscure (Caglioti 1986, 151).

redimensioning of design in Brazil is outlined within an ambiguous magical structure that has produced pleasing and original aesthetic results, with the production of authentic objects of a Brazilian matrix albeit of a universal expression.[18]

5. Intuition: from materiality to magic

The Brazilian designer reveals shamanic behavior. He creates original pieces with great expressive force and strong emotional appeal. Once disengaged from past burdens, this professional is intuitive and does not rely on theoretical models in order to develop his projects. He seeks inspiration in more ethereal worlds and reveals a natural spirit of observation, an attitude of a personal and subjective character. The starting point for the creation of his product does not follow paradigms: he thinks of things which may stimulate people's senses even before thinking of an image that will determine the object's form. Such a paradigmatic rupture finds certain correspondence in the way the shaman narrates the mythological tale. The narration of the myth does not follow the natural course of events. It must be understood in its totality because the basic meaning of the myth is linked to groups of events (Lévi-Strauss 2007, 60). In both situations – that of design or that of the myth – the perception of its meaning does not follow a horizontal path because it is more than what is revealed. The perception of the meaning goes along a vertical route: it happens simultaneously, it is integral, and it concerns all senses.

This means that the elaboration of the object is not restricted to a bottom-up approach, in other words, that of "appearance", an elaboration linked to a first glance. It considers a "beyond", a top-down approach which requires an interpretation of thought and criteria of judgement.[19] To perceive the form, colour, material, and texture is one of design's most important aspects, but the aesthetic results are not always able to account for imagination as a process. Perception does not only come down to this because there is something more. This "something more" does not refer to questions concerning the way of creating but the way of making someone feel something: it is an attitude that highlights how things may be perceived by the senses. Only through interaction of all senses would it be indeed possible to begin to see, to experiment.

As a consequence of such shamanic behaviour, the object has been conceived in Brazil as a "quasi-corpus", in other words, as a being whose reality is not exhausted in the exterior relations of its elements. This product does not only occupy a place in objective space but transcends it by establishing in it a new significance, in which objective notions of time, space, and form cannot fully account for its reality (Fig. 3). This object is not conceived to be solely captured by the eye: it includes all the senses because it is the bearer of a multimedia message.

Whenever a message to be decodified is of this sort the spectator's perceptive process clearly becomes more complex. All senses are interconnected in humans in such a way that an object's visual appearances are crossed with those of the mind. The latter establish a dispute with representations linked to experiences and to the intellect's imaginative capacities, thus instituting a dynamics that alludes to mythical and poetic allegories. At this moment a great number of sensations interact with the spectator and make him feel the object fully; in other words, the spectator perceives the object with the eyes, touch, smell, taste, and hearing. It does not stop there: this plurality of sensorial components may still be surpassed. By emphazising the details related to these sensations, what is important to state is that if intuitive creation were to be abstracted from the product, if the product were to be reduced to a mere objective body situated in an objective space, then the designer should seek only a reaction of stimulus and reflex from

[18] Aesthetic pleasure and emotion are only perceived if an infraction occurs within a preestablished harmony. This rupture is also known as originality.

[19] Top-down and bottom-up approaches have been applied in several cognitive areas, including the field of perception. A bottom-up elaboration begins with an analysis of sensorial inputs. Information derived from such inputs are transformed and combined towards the constitution of the perceptive object, in other words, information travel from the lowest to the highest levels towards the most cognitive ones, those which determine perception. A top-down elaboration performs the inverse: it is used to describe higher factors, the most cognitive factors of perception. Such higher-order information operates from the top towards the bottom and influence the way sensorial input is interpreted (Rookes 2002, 20).

himself and the user-spectator. As a result, communication would be limited to the eye as an instrument, not as a human means to see the world.[20]

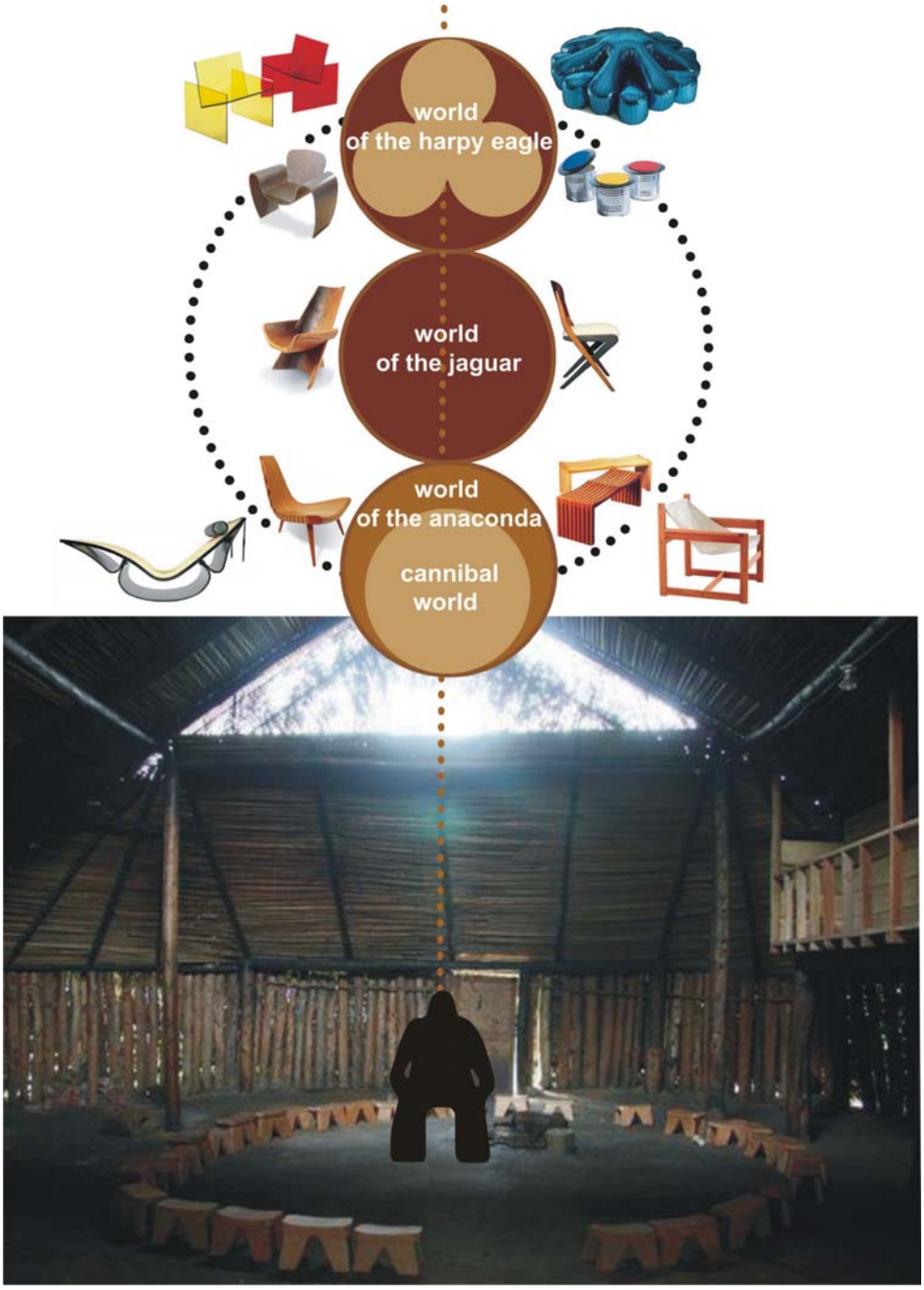

Fig. 3: The Brazilian designer conceives the object as a “quasi-corpus”, a being whose reality is not worn out in the exterior relations of its elements. In the same manner as the shamans or "pajés", Brazilian designers assume an attitude of pajés of industrial design.

Such process of interaction and integration among sensorial components remains at an unconscious level of organization in the majority of people. Only in a few individuals is there a conscious union between information that derives from the various senses (Riccò 1999, 61). According to the indigenous phenomenology of the myth of the world, this was an ability of

[20] The parallel course of further sensorial records requires the formation of phenomena in which the action of a meaning interacts with other modalities, thus modifying perception (Riccò 1999, 3).

communication which was taken away from humans, except from shamans and from those who chose to carry out works of a physical, spiritual, and psychological nature.[21] The adaptation of myth to reality enables one to state that this situation is pertinent to the designer of the world of the harpy eagle and to the shaman of indigenous tribes. Both are capable of perceiving and communicating other models of thought because they embody intuitive rituals. Whereas intuition makes them defend values that are rich in meaning and act on a more human creative scale, communicating with Nature and with materials instead of wanting to dominate them, synesthesia integrates and juxtaposes all the senses in favour of this intuition.[22]

Intuition promotes creativity by taking into account a multiplicity of points of view. As this is a prism which opens itself up in search of the new, the logic of shamanic thought – which has intuition incorporated to its conduct – appears to relate to creative thought in the strictest possible sense. Shamanic thought possesses a logic of values which allows it to communicate with the outside world. Its mechanisms encompass magic and rely on knowledge and experience, not on valid models. Substantially speaking, the parts of a given thing which are normally organized and interpreted successively in the West are provided by magic in a simultaneous way. What differs between both logics is that the Western rational mechanism guides thought whereas its shamanic counterpart serves it. Understanding the structure of this mechanism does not make one learn supernatural formulae; such understanding helps one to perceive the existence of other routes which a designer may follow in order to employ his own intellect. Therefore, once intuition has been used by designers in the search for new results and languages, the addition of the mechanisms of shamanic thought to those of rational thought might provide design with new perspectives in the present situation.

The shamanic perspective does not intend to focus only on isolated problems; it also aims to find new ideas and interpretations of reality regardless of their type. What basically characterizes this thought is the control exercised over its own proceedings. If this thought chooses magic as a system, for instance, it is because it wishes to use magic as a method, not because it refuses to adopt any other method.

Shamanic magic is not absurdly complex nor is the systematics adopted by the shaman too complicated. The monotony of its acts, the scarse variety of its representations, and its uniformity are all part of a relatively simple system (Mauss 2000, 91). In order to create new, valid, and practical ideas shamanic magic seeks simplified solutions that reveal unusual aspects of a thing or situation. Quite often the components are already available in the environment itself and all that is needed is to regroup them in a new structure. When shamanic magic relates beings and things it changes their forms and inverts their roles; it creates and recreates a world that is never complete. To produce something new from the very start is surely creative, but to make something known become unknown is also an act of creation. One way or the other, this process reveals a principle that considers things from the perspective of their totality, not from their separate parts.[23] It is the prime act of doing, a simple gesture that weaves new surfaces and realities.

In summary, shamanic thought is a kind of attitude that is materialized within Brazilian design as magic, a practice that reveals reality fecundated by imagination. Such practice of materialist inspiration highlights the complexity imposed by contemporaneousness by turning to a popular quotidian that desires a return to Nature, an integration with the whole. This practice does not aim

[21] In conformity with this myth, the sky was permanently occupied by a large luminous object towards which human devotion and admiration were turned. The planet was linked to this luminous entity by means of an access bridge whose course was changed by history at a given moment in time; this generated cataclysms and evoked a catastrophic end to this golden age. Such cataclysms allegedly shattered collective consciousness to such an extent that the spirit of man no longer had access to the thoughts of other individuals, at least not under normal circumstances. This catastrophe led man to isolation and made him lose all sense of communion with Nature, with the planet, and with the gods (Drouot 2001, 162-3). Shamanic myths speak of a time in which Nature and man lived in complete harmony.

[22] To observe nature, to produce results from senses, and to direct them towards the process of how to do things and how to communicate is an attitude which reveals a new field that unites design, science, and senses (Hara 2007, 71).

[23] Nature - when observed in its infinite details and peculiarities - reveals that elements placed in its interior are confounded among themselves instead of highlighted (Borges 2003, 148).

at reality as an undifferentiated totality but at objects and desires reduced to the status of things. The process consists of a succession of images born of the juxtaposition of material elements. This results in a panorama that mixes the unindividualized quotidian and subversion and imbricates them in each other. Here the occult forces of objects are set free by magic and, by following the simplicity of the shamanic system, they harmonize with reality by surpassing logical causality. Whereas shamanic magic seeks simple and flexible answers for things, logical causality aims to answer the complexity of contemporary society by becoming even more complex.[24]

One should warn that the risk of the process which encompasses both shamanic thought and design consists in transforming this cultural relation in a fashion event or in an elitist phenomenon. It should be pointed out that shamanic behaviour in design is more a mental form than a combination of techniques used to disassemble and reassemble physical components. The function of this mechanism consists in seeking icons, in finding new correlations, and in transforming the various elements dispersed in the world into creative expression. All this is intended to help man achieve a less materialist human condition and thus integrate him with the universal whole.

6. Conclusion

It was not the aim of this paper to discuss the functional or stylistic elements which involve the shamanic universe and Brazilian design, but to show that non-Western civilizations reveal logics that are rich in interesting energies and that are able to provide a renewing feature to current projects. For this reason, the ethnical-existential implications related to the shamanic aesthetics of Amazonian Indians and to the aesthetic mysticism of contemporary Brazilian design were frugally focused on the observation of figurative and symbolic codes during this research's analytical process. What really mattered to the analysis was the verification of the context that has outlined the new human condition of contemporary societies.

For Western societies it is difficult to comprehend that native practices of transmission of knowledge are based on that which exists, on the mechanism of copy, not on the idea of innovation (Gordon 2006, 29). This allocentric and mimetic feature of indigenous innovation promotes a sense of unauthenticity when submitted to Western concepts of originality. Parallel to this, verifying that rational thought does not seek to interpret reality in general is indeed odd. Therefore the West has failed to work in favour of true invention; instead it has worked in favour of a successive elaboration of inventions of the past. Through both situations the concept of creation in the West assumes an almost contrary connotation when confronted with the meaning of creation adopted by indigenous cultures. Originality has always been overestimated in Western societies and underestimated in other cultures because mechanisms employed by other intellectualitites have been unknown. However, the following statement must be considered: in order for a given culture to be unique and to be apt to produce something original, the culture itself and its members must be assured regarding their originality and superiority over other groups (Lévi-Strauss 2007, 31).

Situations such as this end up restricting the view of Western man and limiting his capacity to perceive the universe only within the boundaries of rational logic. The scenario that constitutes the panorama of global reality includes other possibilities. In the world we live in there are various intellectual procedures which radically differ from the logical method and which are, maybe for this reason, fecund with new ideas. In fact one logic does not exclude the other; both are complementing procedures because they are open to different perspectives, all of which are equally valid. The consideration of other intellectualities is equivalent to increasing sensitivity in

[24] This is the opinion of Wolf Prix, of Studio Coop Rimmel, regarding the "decostruzione" of architecture. According to his assertions, architecture should become more complex at the turn of the millennium in order to respond to and to express the complexity of society (Bottero 2004, 41).

favour of several points of view which originate from a certain situation; such points of view enable one to see the multiplicity of routes which may lead the designer to more interesting solutions. This means that procedures related to other logics do not cease to be satisfactory alternatives at the moment in which a logical procedure shows difficulties in finding the solution to a given problem or when it requires innovative ideas.

The 21st century is an era of discovery. Certainly one of this century's design tendencies is the attempt to understand Nature and to interact with other logics of thought that are capable of assisting man in the development of projects and of bringing him closer to a less materialist human condition. It is true that contemporary designers benefit from the same laws that regulate natural processes in order to create their products. However, by taking into account the complex phenomena of constant transformation observed in present times, designers are not too interested in carrying out definitive projects: their expectation refers to experimenting with the unknown towards suggesting systems of various kinds, imperfect and incomplete systems that must be adapted to a context interconnected with numerous logics that are responsible for the configuration of the world of today.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Is change as good as a holiday?

Using metaphysical bonds to design enduring change

Ian Coxon[1]

Abstract

Two things are necessary to recognise in a condition of everyday change. The first is to become aware of what it is about the everydayness that by contrast allows us to recognise that change has occurred. The second is the ability to determine what it is about the change that brings about a positive reaction to the perceived differential (the change).

This paper describes a new Taxonomy of Experience (*ToE*) useful for structuring and bringing to consciousness, aspects of everyday experiences which are commonly overlooked. It also presents a *SEEing* process for distilling and making visible the deepest (metaphysical) layers of meaning within these experiences. This metaphysical understanding is useful to designers as a primary change agent and for promoting stronger bonds to change. The design research methods (tools) presented in this paper are immediately useful in sustainable design activities such as design for longevity, design for social equity, universal design and many decisions affecting various stages of the product/service lifecycle.

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Prologue

Why use ‘metaphysical’ bonds and why refer to change as good as a holiday? My reference to metaphysicality is strong throughout this paper mostly due to a chance encounter with Singanapalli Balarams (1989) thought provoking paper about the power that Gandhian metaphors had in effecting change. Change being the key word in this context, not the metaphors or their metaphysicality. The metaphors Gandhi employed were not particularly striking in their physical form (his home spun white cloth, sandals, spinning wheel) but they contained powerful mythological and metaphysical qualities which the ordinary Indian people related to very strongly[2]. This has a similar resonance to the many things we are attracted to that have no great material value but which we treasure for their metaphysical value anyway (Grandmas teapot, my high school year book, a Stark lemon squeezer)

The holiday analogy is only important in establishing a different contextual perspective on how we react to change. It is as good as any other in so far as it is one which most of us are familiar with. In my holiday analogy for instance, I work and go about my everyday life then suddenly find myself (on holidays) in a different, strange and sometimes exotic place inhabited by strangers with strange habits; possibly a companion or two who I have hardly spoken to in months and now must spend every waking moment with. This mind-space is suddenly very different to my ‘every-day’ or normal life.

Over the following week or so (of the holiday) I slowly sink into ‘holiday mode’ and before I know it I am again wrenched away from my wildly exotic poolside lethargy and must return to what now appears strangely and disappointingly familiar – the grind of normal life. Is this why so many people experience depression and anxiety on return from holidays? What is it about this time away from our everyday life that fosters a positive condition, the cessation of which causes such negative withdrawals?

What is it about the holiday that offers a lesson about change?

and what does this have to do with metaphysicality?

If change (like a holiday) is to be considered a good thing, then what is it about a holiday that is good and by association[3], makes change a good thing? A holiday takes us away from the ordinary and everyday. It is the degree of difference (change) between our everyday experiences and those experienced on the holiday that make the change so recognisable and usually, pleasurable. A weekend away in the mountains or at a friends house in the country is nice but doesn’t shake our world (read perspective on life) half as much as two weeks in the snow fields or rafting down the Amazon.

Two things are necessary to recognise in this condition of change. The first is to become aware of what it is about our everydayness that by contrast allows us to recognise the change. The second is the ability to determine what it is about the holiday experience (aka. change) that brings about such a positive reaction to the perceived differential to the everyday. It is this positive experiential component that I keep referring to in this paper as the metaphysical[4] aspects of change.

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[2] Gandhi came from a privileged background and did not initially understand these metaphysical qualities. He intentionally went out amongst the people he wished to help in order to study them closely and come to understand what was meaningful to them. This same process of developing understanding through immersion and using this understanding to effect change is a fundamental premise in this paper. (Balaram, 1989)

[3] A reference to the saying ‘A change is as good as a holiday’

[4] In this paper, the terms Metaphysical and meta-physicality are used in their broadest sense without ascribing any particular disciplinary or philosophical connotations. They are used to convey spirituality (without the religious component), ephemerality, intensely emotional and cerebral responses beyond the everyday physical plane.

1. Introduction

What is the meta-question, this paper addresses?

If the degree of change in sustainability required in the foreseeable future is so great that the concept of design itself is redefined, where do we start? The broader design community[5] has been aware for a considerable time that greater acceptance and commitment to sustainable products, patterns of behaviour and modes of thinking are needed to achieve the level and direction of change required for a sustainable future. (Fuad-Luke, 2006; Heiskanen & Pantzar, 1997; Manzini, 1992; Shove & Ward, 1997). In this paper I propose that a starting point for the required degree of change lies in re-valuing the role that a fundamentally more human-focused perspective has in the design (read sustainable design) task. This proposition goes far beyond the current trend of 'greenwashing' and further than the partial amelioration offered by popular user-centred and anthropologically focused studies. A revaluing of the human perspective is beginning to gain momentum with relatively recent interest in human-centred design (AIGA, 2006; Norman, 2004). This is a turn in the right direction however, the practical reality is that in order to understand humans better especially for design purposes, we need a lot more methods and knowledge about ways of going about it.

In this paper I am proposing two new ways to help to begin this process of valuing the human dimension as a starting point (not endpoint) for designing. I contend that by understanding the complexity of an everyday experience and the strongest metaphysical (spiritual) layers within it, that designers and decision makers will understand the bonds that create the strongest attachments to the experience. This is the first step in achieving the dual holy grails of sustainable design. To provide more satisfying (sustaining) customer experiences whilst delivering this in a more sustainable manner.

How is this question answered in this paper?

Quite enough has been written that defines our current situation in terms of sustainability and designs role in leading us to this point (Fuad-Luke, 2006). And socio-technical discourse abounds with reasoning for why we are in the position that we are in (Wiebe E Bijker & Hughes, 1990; Haraway, 1991; Latour, 1994; Michael, 2000). It appears that we know what we have to do. We know we have to do it now. We are just not sure of how to go about it. The tools presented in this paper can help in real and tangible ways to achieve these goals. This paper offers two new methods[6] that enable designers (and decision makers) to understand deeper layers of everyday human experience. The first will help designers to more clearly structure and see what is there to be seen within a given experience or event (the data) . The second probes more deeply into the hidden layers of meaning contained within the available 'data'; teasing out the deepest, intrinsically motivating forces within the experience. These are the, beyond-the-form-and-function, 'metaphysical' forces, which if understood and applied back into the sustainable design process (assuming the materials and energy intensity questions have been addressed), help to create stronger bonds and commitment to the kind of change intended in the design (either product, service or product-service system).

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[5] Alludes to a broad range of sustainability and 'design' related perspectives presented by engineers, architects, sociologists, anthropologists; disciplines from both sides of the natural / human sciences spectrum. (McDonough & Braungart, 2002; Sofoulis, 2002; Stegall, 2006).

. [6] These methods while they are specific, structured and have defined outcomes are not limited to a *techne* interpretation. They should be taken as a methodological representation of a human centred philosophy suggesting ways to explore how we (as designers) can better understand what is important to all of us as human beings and so design more humanly-satisfying things (read sustainable attachment and ownership). Approaching these methods in this way opens them up to adaptation, extension and exploration – strangely, all laudable human traits.

2. In what ways can sustainable design begin to change?

Earlier I proposed that a starting point for change could be based on re-valuing the role of more human perspectives in design. Understanding a human-oriented perspective requires an understanding of what humans find meaningful and of course this raises the obvious question 'what do we mean by meaning?' This seemingly circular logic goes beyond the linguistic argument[7] so that we can address what is meaningful in the metaphysical sense. I contend that this human metaphysics is a missing ingredient in the intentionality presented in all things designed (Margolin, 2000). The meta-physicality of human experiences involving designed products/services is not the same thing as the cyborgised, socio-technically normalised relationship outcomes that are essentially unintentional by-products of design (Buchanan, 1989; Shove, 2007). Axiomatic suggestions that 'material objects configure their users' coupled with socio-technical theory (Wiebe. E. Bijker, Hughes, & Pinch, 1987) suggesting that this is a two-way relationship confuses the efficacy of current design practices wherein little is contributed from the user side other than from research after the fact. This imbalance might be addressed by designing objects that incorporate at a foundational level the metaphysical qualities valued by real-life, everyday, ordinary people.

The environmental imperative to design more for the metaphysical 'reality' of experience than the physical unreality of consumerism is well understood. (Heiskanen & Pantzar, 1997; Manzini, 2003; Shove, 2007). And the superficial and transitory un-gratification of unsustainable consumerism is at least partially due to a lack of metaphysical fulfillment (Hamilton, 2003, 2005).

I propose that this condition comes from a lack of understanding about and an undervaluing of the metaphysical aspects of experience. Until recently these aspects of experience have largely been inaccessible for lack of knowledge about how to study them and subsequently under-pursued in user-research (Green, 2001). For this reason it is important for designers to know how to understand the metaphysical so as to intentionally design stronger more satisfying, meaningful and lasting relationships (bonds) between customers and their purchases.

Stegall (2006) in recognising a lack of this type of understanding, proposes a set of four, ecologically oriented design philosophies which support 'intentional design'. The first two philosophies are very familiar and relate to Resources (materials and energy intensity) along with Form-and-Function (a 'post industrial' design approach). Further to these he advocates two design philosophies referred to as philosophies of 'purpose' and 'spirit'. One of *Purpose* promoting "a set of values, attitudes, and characteristics that designers wish to promote" and one of *Spirit* supporting a "feeling of kinship – spiritual [metaphysical] connection and sense of stewardship with the natural world" (Stegall, 2006,59-60). In order to successful employ these philosophies in sustainable designing, a designer must develop what Orr refers to as 'ecological literacy'. The methods described and presented in the next section of this paper satisfy Orr's call for methods that help to achieve this form of literacy; but they also take us beyond Orr's observational limitations, to a metaphysical level of understanding of the people we wish to design for.

> *"Overcoming this obstacle requires designers who can enter a local environment, observe and understand how its people relate to each other and to the natural world, and develop methods for improving those interactions... the fundamental skill of designing for sustainability is ecological literacy" (Stegall, 2006,63)*

[7] Refers to linguistic explorations of meaning such as I.A. Richards *The meaning of meaning* - (Griffen, 1997)

3. Tools for understanding the metaphysical aspects of events

The tools described in this section (the *ToE* and *SEEing* methods) relate to understandings of the kind described by Orr (1992) when referring to ecological literacy. They are intended for a designer to become immersed in the experience to be understood and with that perspective to analyse the data collected in such a way as to develop deep personal understandings of the metaphysical essence of the experience.

3.1 Taxonomy of Experience (ToE) : A model of experience

This hierarchical model is useful to researchers and decision makers as a general method or tool for guiding the collection, processing and categorisation of field data about an everyday experience. During trials, participants using this model, referred to the process as 'doing a ToE'

The *ToE* is a tool or model for understanding the ordinary, inauthentic[8], un-real, unconscious aspects of an everyday event. This method is useful for building a picture of the everyday and its fundamental 'everyday-ness' that by contrast allows us to recognise when something special (change) occurs. It is a method for structuring and bringing to consciousness those aspects of the everyday which are easily and commonly overlooked. In the two pronged approach to understanding the metaphysical aspects of an experience presented in this paper, the purpose of the *ToE* phase is to establish a clear understanding of the foundations on which any change might be based.

Both of these methods have been developed out of primary field research and analysis which explored phenomenological and hermeneutical methodologies to gather material and explore ways in which everyday lived experience might be probed for the deeper layers of meaning it contained (Coxon, 2007)

Findings from the initial data analysis in this research were compared to existing knowledge streams on the structure of experience from design theory as well as with disciplines outside design in psychology, neuro-physiology, sociology and marketing. These comparisons suggested that information gathered about an experience might be usefully explored if structured in the form of a taxonomy. The structure or 'Taxonomy of Experience' (*ToE*) that we have used with considerable success in university trials is shown below in its simplest (skeletal) form.

Insert figure 1 here

[8] Refers to Heideggers term for the everyday aspects of life experience "Modal undifferentiatedness, or indifference, between authenticity and inauthenticity is what Heidegger calls Dasein's 'average everydayness" (Carmen, 2003,2; Heidegger, 1962)

1. THE GUT - Somatic experience
    - Sensorial
    - Sight
    - Touch
    - Smell
    - Taste
    - Sound
    - Ergonomic
    - Aesthetic
2. THE HEART - Affective experience
    - Positively valenced affect 1 - 7
    - Negatively valenced affect 7 - 1
3. THE HEAD - Cognitive experience
    - Connation – reflective experience
    - Cognition – reflexive experience
4. OUT THERE - Contextual factors
    - Environmental factors
    - Regulatory factors
    - Social factors
    - Existential factors
    - Corporate, Economic, Political
    - Other – as determined by the situation

I will briefly explain how each of these sections in intended to be understood.

Somatic experience

Somatic aspects of an experience stimulate or directly impact on the physical body including sensorial stimuli, comfort (ergonomics) and appearance (aesthetics). These are what Donald Norman (2004) refers to as the 'visceral' level but whose descriptors often contain more complexity than simple physical references are able to convey; such as richness of colour, tactile appeal, comforting sounds.

Affective experience

In the *ToE*, Affect is treated as principally focusing on 'emotions' that is the mostly short duration, intense affective responses to experiential situations. Affective experience is sub-themed in terms of its positive and negative valance[9].

Cognitive experience

The cognitive section of the *ToE*, refers to the way in which a person 'thinks' about both internal (reflexive) and external (reflective) aspects of experiences. Cognition or 'Internal' aspects describe the way in which a person thinks about themselves (self talk), for example, "I am an industrial designer ...where am I going with this paragraph" Externalised cognitive thinking (Conation), relates to the way in which a person thinks about things that lie outside themselves, that may or may not lead to action or behavior, for example, "I must remember to email Larry the specs for that…what is that clown doing in that car? … that shirt should go nicely with that tie…"

[9] Valence - psychological value of the experience denoted in a positive Vs negative way (Reber, 1985).

The context of the experience

The somatic, affective and cognitive meta-themes described above, are all integrally situated with a contextual space (See Figure 1 above). This part of the *ToE* describes aspects of the context (the everyday life-world) in which the experiential event takes place, but only aspects that are considered immediately relevant to the people directly experiencing the event.

Summarising the Taxonomy of Experience (ToE)

The Taxonomy described above constitutes a framework for gathering and compiling data about an event in such a way that it provides the researcher with a preliminary picture of the experience through familiarity with its parts (constituted by small fragments of the experience which are essentially individual cause and effect stimuli). Through the experience of compiling and formatting data into the *ToE*, the designer (researcher) gains an initial understanding of the experience as a whole (*ToE*). This stage is similar to the data coding / analysis methods employed in ethnography but utilises the *ToE* as a flexible nodal structure instead of using predefined or *in vivo* methods (Creswell, 2007). Setting up a *ToE* of an event is a valuable establishing process in itself, which generates in the researcher a useful, be it broad grasp of the experience. This is the stage at which most ethnographic and phenomenological analysis tends to conclude. The *SEEing* method that follows, describes an entirely new approach to deeper analysis of the data contained in the *ToE*. This method takes phenomenological and ethnographic data analysis to a deeper level where the metaphysical side of an individual or group experience can be understood.

3.2 SEEing: Exploring the metaphysical essences of an experience

SEEing is a qualitative data analysis method which employs nine sequential steps through which information about an experience being studied, is gathered and reduced in a process that allows a researcher to *see* the metaphysical or spiritual 'essence' of the experience. The *SEEing* processes distil and make visible the deepest layers of meaning that uniquely define[10] the experience for what it is. The goal of the *SEEing* method is therefore to understand the metaphysical, the differential, the primary change agent, the authentic and the real.

What it is about the holiday experience (aka. change) that brings about such a positive reaction to the perceived differential to the everyday?

The moments when we are most in touch with ourselves and events in our lives are the moments when we become truly aware of being alive (Heidegger, 1962). It is this kind of alive-ness, this awareness of our being that we are confronted with in moments when we are confronted with change. On my holiday, change takes the shape of something requiring me to cope with something new, a situation that is unfamiliar or that forces me to reconsider my ability to adapt. It is in a way, mildly threatening, but it is precisely this difference to the normalness of the everyday that tells me that I am not at home, I am on holiday. Indeed, I would argue that it is the degree of differentiated-ness that I experience that defines the attachment I develop or the value I ascribe to the experience. Thus my visit to the local beach does not hold the same metaphysical value as my holiday in the Bahamas. This type of argument drives the kind of thinking that follows.

…and back to the ToE

[10] The use of the term 'define' is not to suggest any form of formula, codification, categorisation or fixed notion of the essences derived. They are and always remain fluid and metaphorically indicative of the understanding that these metaphysical essences generate in the designer-researcher

In the first (*ToE*) phase described above, the researcher establishes a basis for understanding an everyday experience (using the *ToE*) and develops a deep familiarity with the complexity of its everyday-ness through the gathering and coding of data into the *ToE*. The next, *SEEing* phase, begins to explore within the experience for the extra-ordinary, the aspects that are differentiated from the everyday base level of the experience, the ones that begin to emerge from the deeper metaphysical layers. This is the process which leads to understanding the aspects of the event which create the richest, most positive and lasting relationships to it.

The *SEEing* process like most qualitative analysis methods can not be done in five minutes. It takes considerable time to sit with the data, shifting and sifting in an iterative conversational process where data is interrogated and interpreted repeatedly. For space reasons it is presented here not as a detailed how-to, but as a summary of each of the steps in a quite simplified form so that a general sense of the process can be gained.

Step 1: The researcher learns the language of the experience through immersion in the experience. This step sets up the knowledge base which the researcher will later rely on to interrogate and interpret experiential data.

Step 2: The data captured about the experience is turned into rich text. Detailed experiential descriptions of the field data (interviews, observations, context studies) are written and used as a normalised data source.

Step 3: The text is thematically separated into its multiple general meanings by interpreting alternative (causes or effect) meanings out of the text using the researchers understanding of the language of the experience. It is placed (stored) in the *ToE* framework at this stage.

Step 4: Multiple hidden meanings are explicated out of these cause and effect meanings. Each fragment of data is further interrogated for the multiple alternate meanings that they contain. These become ‘see-able’ using the researchers’ earlier auto-ethnographic experience as an experiencer.

Step 5: The most essential (experience defining) meanings are filtered off. Meaning data that is essential or that ‘make the experience what it is’ are separated out from that which is ancillary or superfluous to the experience.

Step 6: The *extra-ordinary* metaphysical meanings within the experience are filtered off. Meanings describing basic, everyday, form and functional aspects of the experience are filtered out leaving the spiritual, metaphysical meanings.

Step 7: The researcher ranks the most intense meanings. The metaphysical meanings are not all as intense as each other. A ranking is applied so as to determine which are most important in defining the experience.

Step 8: Metaphysical meanings are grouped into themes and ranked by intensity. The most intense of the metaphysical meanings are interrogated and grouped into like themes. This clusters the more powerful metaphysics together into 4-5 key themes.

Step 9: The most intense metaphysical themes are re-expanded by describing them in terms of the essential meanings from which they came. These themes were derived out of the most essential elements of the experience and it is helpful for further communication[11] of the metaphysical essence of the experience to be able to describe them in some detail.

Student experiences and outcomes from using the two tools …so far

[11] Methods for communicating the metaphysical essence of experience have included the use of abstract manifestations, personas, storyboards and scenarios. Future research might explore the communication of this essence with virtual persona avatars acting out design interactions in 2nd life scenarios.

University trials with students in Australia and Germany have provided interesting and encouraging results using this type of development of everyday and metaphysical meaning. The Australian students' overall reaction to the trial was positive with a significant number experiencing very positive outcomes. The project succeeded in providing an experiential learning vehicle from which most gained a rewarding learning experience. The *ToE - SEEing* methods succeeded in being teachable, testable and provided a deeper understanding of the experience in most instances where due diligence was applied. The German trials of the *ToE* and *SEEing* design research methods were also very successful. Students achieved varying degrees of public recognition for their exhibited thinking, but overall there was agreement from academic staff and the greater student body who attended the final exhibition that the results were positive, unexpected and rich. While many students laboured under the existing interface and the volume of data-processing required, there was universal agreement that the process yielded surprising information from which to base their designs.

4 Conclusion

How do these methods help designers to make the desired change?

The methods briefly described above help designers to deeply understand the metaphysical layers within an experience so as to better match with human expectations of what is being designed to fulfill these expectations. They will help designers to design from more human-centred, (metaphysical) perspectives; enabling them to give primacy to these perspectives in the artifacts they are designing. It can be seen in my holiday analogy that metaphysical layers of meaning create stronger more lasting relationships (bonds) to exceptional as well as everyday experiences. Metaphysical bonds are stronger than the physical bonds offered in designs based on form, function and fashion. These types of physical (read superficial) bonds are easily broken by the 'next big thing' (the fundamental flaw in consumerism), while metaphysical bonds are longer lasting, more satisfying and culturally sustainable.

…and this can be useful to sustainability how?

It is largely our bond with the metaphysical that underwrites our attachment to things, events and even to change itself. It is the nature and strength of this bond that will help determine the direction and strength of our commitment to any changes proposed. If design is to provide the seeds for sustainable change in terms of new products, services, service systems or lifestyle changes then it must understand the metaphysical bonding agents that people will respond to and also the new bonds these new socio-technical systems are likely create within their recipients. Designers need to design experiences (incorporating the everyday and the metaphysical) which consumers want to own and value. This requires a deeper level of understanding of the conditions underpinning the change being induced and whether they are likely to create an effective and lasting bond with their recipients.

Where to from here – how can these tools be improved and more widely applied?

This paper is a first step in the process of dissemination and use of these methods. With continued use I expect they will be refined and evolve into more useful tools for advancing sustainable design. More interesting and productive ways will be found to reify the metaphysical. New media such as virtual avatars and 2nd world scenarios might be employed in future efforts to give voice to the metaphysical. The designing of products and services containing the full richness of metaphysical meaning have yet to be fully explored.

With all of these possible developments, the core purpose of these methods will remain the same – to aid the process of valuing, understanding and applying human metaphysical values to strengthen the bond between designed objects and services in the lives of people. Of course these methods are immediately useful in sustainable design activities such as design for longevity, social equity, lifestyle change, shared use and universal design however, the

understanding generated in designers using these methods is also useful in design decisions affecting many stages of the product/service lifecycle.

There is now a need for industry exemplars to show the way. Commercial industrial trials are required to showcase the benefits to sustainable innovation that these kinds of methods bring to a diversity of industries so that a general platform for change can be established. Without bridging the gap between design pedagogy and design practice these types of methods remain impotent. This will be a difficult process in a manufacturing world committed to sales volume and an economic model based on growth, but industrial early adopters and trend leaders, must be found and fostered. The concept of using metaphysical values to create stronger bonds and longer lasting relationships will not engage the imaginations or esoteric values of shareholders intent on higher economic return. However with the burgeoning shift away from monetary based fiscal accounting to triple bottom line reporting and carbon-based economic modeling, these values will very soon have a important role to play in changing the change.

It is time to discover the meaningfulness of man rather than searching for meaning in things.

If we must have things, then let them mean what is meaningful to man and not the meaningless shallowness evoked in him by things, without his knowing. Anon

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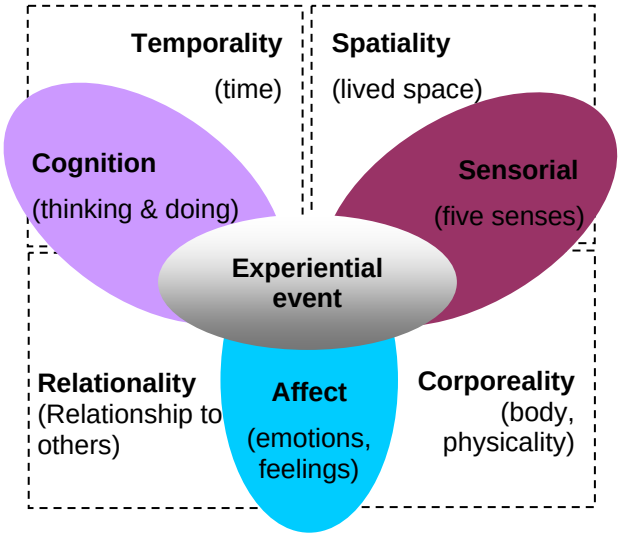
Fig. 1: Framework of experience



Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Macrocomponents

An alternative proposal for the production of home integrated systems

Brunella Cozzo[1]

Abstract

Due to the current crisis of the macroeconomic scenario, the production type approval of competing firms, but first of all the new environmental urgent needs, is rising the need of reconsider new production scenarios.

The methodological approach of the Design by components (Luigi Bistagnino, 2008), appears as one of the possible open paths to successfully face the on-going change; thanks to this approach we can redesign new typology of products/production chains as well as the system they are introduced in.

In order to improve the performance of objects we need to consider each of them as a system-object, in other words a system where components are in tight and complex relation.

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1. Actual situation

Recent European researches revealed that, during the last 15 years, the industrial production in the field of home appliances, has been dedicating special attention and investments to the reduction of consumption, conscious use of materials and performance improvement.

Data presented by the organization *CECED Italia*[2] in Strasbourg confirms an improvement in the energetic efficiency of home appliances. Representing 60-70% of national energy consumption, the improved efficiency of these appliances has contributed to a reduction of 10% in total consumption.

Unfortunately, these initiatives allowed a limited improvement of the environmental fallout: in fact, the continuous technological evolutions cannot ensure anymore an effective reduction in the consumption and in the emissions that commodities produce. Although nowadays we think we are quite advanced, we actually handle objects that could be greatly improved as far as concept and use are concerned, and above all they are often foreign and even hostile to the environment around them. Advertising tries to convince potential users with emotions, diverting them from a reality which is in actual fact full of limitations, improper uses or even deliberately misleading descriptions. As a result we can have a use/non-use, a disappointment that leads to the abandonment of the appliance which will remain undestroyed and maybe indestructible, foreign to the natural environment[3].

Due to the current crisis of the macroeconomic scenario, the production type approval of competing firms, but first of all the new environmental urgent needs, is rising the need of reconsider new production scenarios.

During a recent meeting titled *"Cambiare le regole – il settore degli elettrodomestici: un sistema integrato"* (*"Changing the rules – the household electric appliances sector: an integrated system"*), organized in collaboration with *Politecnico di Torino*, Antonio Guerrini, general manager of *CECED Italia*, underlined the need for changes in the area of white goods; research is these companies' driving force, and for this reason it needs to be continually nourished by collaboration and the exchange of ideas. In Mr. Antonio Guerrini's speech he underlined the necessity of prioritising environmental issues when considering design/production parameters, and that these issues "should not be considered a sword of Damocles, but rather an opportunity to be exploited" in order to comply with the final user's needs and with new legislation, and in order to be more competitive in the market.

2. Possible solution: an interrelated components system

The methodological approach of the **Design by Components**[4] (Luigi Bistagnino, 2008), **appears as one of the possible open paths to successfully face the on-going change**; thanks to this approach, that critically analyses all the parts of a current industrial product, we can **redesign new typology of products/production chains** as well as the **system** they are introduced in.

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[2] *CECED Italia*: association representing the household appliance industry in Italy. It is part of the European network *CECED* (Conseil Européen de la Construction d'appareils Domestiques, namely the European Committee of Domestic Equipment Manufacturers). *CECED Italia* supports the development of the sector by activating the more effective measures in order to strengthen the positioning of Italy – which is one of the world-wide leaders in this line of business – within the international market. The association actively promotes the dialogue among all the Italian interlocutors as well as, together with *CECED*, between these latter and the national manufacturers and the rest of the European/international Institutions.

[3] Abstract from Flaviano Celaschi's speech, at the meeting titled *"Changing the rules"*, organized by the *Politecnico di Torino* in collaboration with *CECED Italia*.

[4] For more details about the "Design by Components" methodology, please see the following papers:
Virano, Andrea. *DESIGN BY COMPONENTS. An operative methodological tool for the ecocompatible industrial design.*
Marino, Gian Paolo. THE SECTOR OF HOUSEHOLD ELECTRICAL APPLIANCES*. An integrated system.*

This approach that also includes the realization of charming containers where components are often located by force, was abandoned in favour of the relations existing between the internal and external elements of the industrial object.

The designer, therefore, is no longer creating a mass-produced object, and innovation does not restrict itself to act in watertight compartments, where problems are faced individually. In order **to improve the performance of objects we need to consider each of them as a system-object**, in other words a system where components are in tight and complex relation. Each system-object is, in turn, considered to be an integral element (that is a component again) of a more complex system.

The final system-object is the addition of every constituent subsystem and it may be regarded as complete (i.e. no longer an element that can be integrated and expanded) when all existing interrelationships will accomplish the performances they have been planned for.

The designer is central to this **new vision** of **design** which cannot focus solely on each single appliance, but which **has to look at the whole home environment in different terms**, using a very **systemic approach**[5]. A home which is completely redesigned according to the standards of the new millennium, where ergonomics, functionality, energy saving and ecocompatibility are all elements of a puzzle to be put together. The kitchen is the environment which requires the greatest amount of rethinking, because it is the most technological and complicated environment in the house, where a huge range of organic substances are treated every day, using fire, air and water to make them fit for consumption and for our physiology. Food culture is universally known as an Italian asset, as are the methods and the means of producing our national delicacies. The refinement of both Italian cuisine and Italian kitchens is very much appreciated abroad, and this is a solid foundation on which to build an enjoyable project which can belong to all of us. Another important factor which is an essential part of our everyday lives is that of cleanliness: personal hygiene, but also the cleanliness of our clothes and of our living environment, to name but a few. Essentially what we need to do is to exploit and promote the attractions of the Italian lifestyle, an age-old culture which is well-known and much imitated. We need to design technological appliances based around this lifestyle and on making our existence more comfortable and natural.

The path proposed by **Design by Components in a systemic vision** implies a design where the **external shape** of the object **is determined by the internal placement of its own components**. This type of design starts from the analysis of disassembled objects belonging to the same semantic category (so as to be able to understand all their constituent parts: materials and components), considering the relationships and connections between components, production technologies and physical-mechanical laws that characterize the product. It is important to consider the approach users could have to the analysed product, taking into account the different levels of accessibility the user, maintenance technician and manufacturer will have.

Each component must be considered as a final product with its own independent life cycle, and must be considered in relation to the other components.

It is subsequently analysed according to a functional scheme, where its composition is revealed by aid of follow-up abstractions, firstly in accordance with an operating scheme, and afterwards with an essential one, allowing for the isolation of the necessary and sufficient functional groups.

Acting on the basis of this criterion, it is possible to comprehend the complexity of the relationships which exist between functional groups and the system as a whole, and to recognize the various different types of problems which need solving.

[5] For more details about the “Systemic Design” vision, please see the following paper: Bistagnino, Luigi. *SYSTEMS DESIGN APPROACH*.

On the basis of the complexity of these relationships we can affirm that Design by Components intends to focus primarily on the system of which it is a part, and to which it belongs.

Design by Components is, to all intents and purposes, the up and downstream conception/planning existing behind and throughout a more complex process that looks at the finished product as the concrete exemplification of ideas, thoughts and the more diverse strategies, all entangled and interrelated into one with the others, in strict connection with the life cycle of the designed item.

Last but not least, is the concept of shared responsibility, also promoted by the 2002/96/EC *WEEE-Waste Electrical and Electronic Equipment* directive. The protagonists who contribute to the ideation, design and manufacture are designers, industrialists, law-makers, economists and final users. They will be asked to collaborate responsibly.

New products created thanks to this mental path represent the execution of relations and functions of the appliances.

Being aware that all household electrical appliances are part of an integrated system (with the territory, the society, the environment, the residential units, …) and not only of the individual production chain, will entail a new product design conception. From this perspective, research is always present inside of the home-system with the following tasks: in the analysis of the most frequently carried out activities, as well as those with the highest impact and of the toughest nature in the domestic field. The three categories which emerged were: washing, food preparation and food conservation. All these categories could be put together to create an integrated functional system.

For instance:

- the fridge will need to be placed within a “food nourishing and preserving system”;
- the washing machine will not only have to be conceived exclusively to wash clothes, but designed as part of the “washing system”;
- the dishwasher will need to be integrated in the “food cooking and eating system”.

Based on the principles thus far expressed, analysis of the washing machine, dishwasher and sink category begins with the disassembly of the products in order to understand what hides under the “external skin”; this activity shows how the different components work and what their role is in the cycles (water and power).

The next step was to define the general scheme, which is composed of indispensable components and the fundamental scheme, which is composed of ineliminable components (Fig 1).

Both schemes consider the treated object as a combination of components and functions of varying importance, an approach which breaks away from the classic aesthetic profile our culture and conditioning consider as fundamental to design development, and which puts the functional role in second place.

Thanks to these new frameworks, the design is free to express itself without formal and cultural constraints, so that the connections between the different components and their external shape can finally be seen as not as a purely aesthetic issue but as something justified by functional, ergonomic and ecocompatible issues.

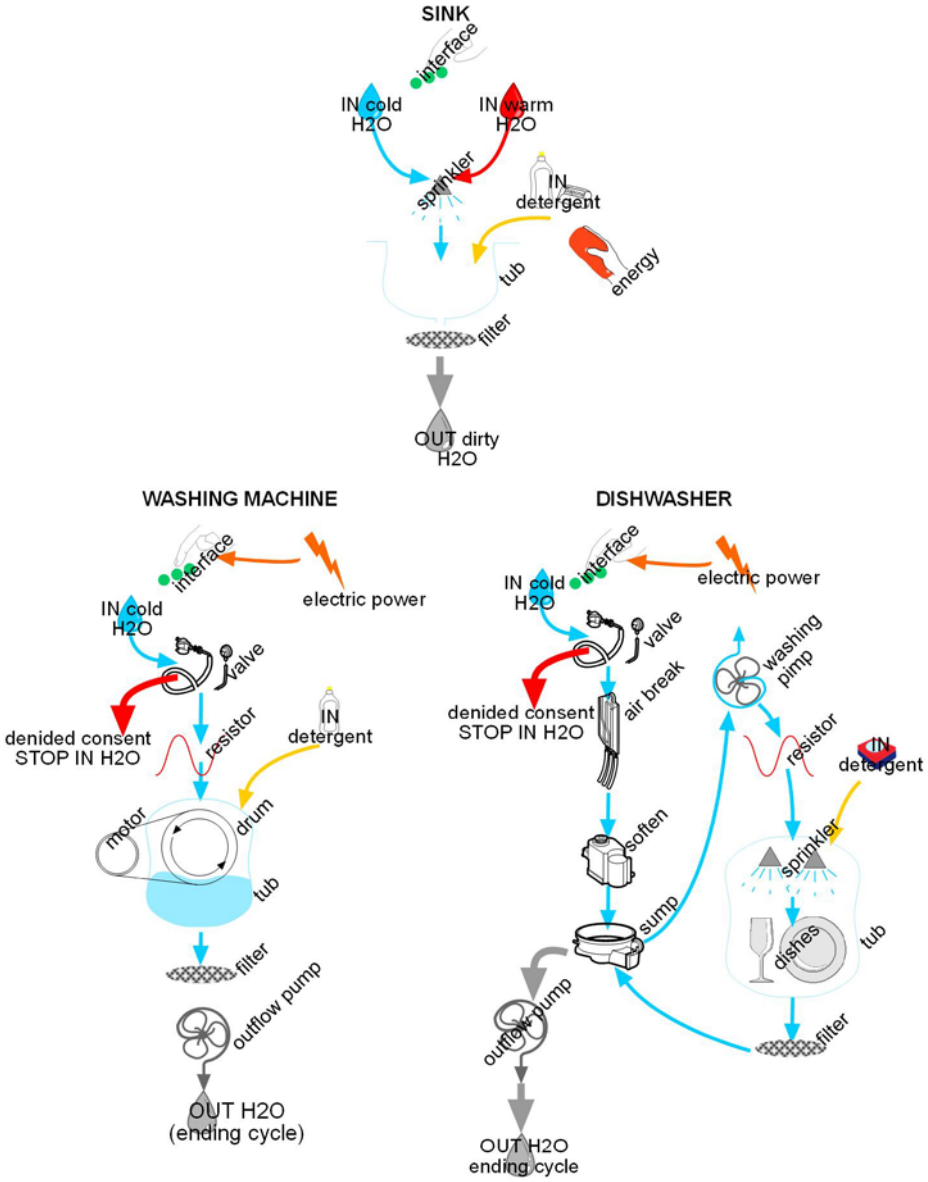

Fig. 1: General schemes underline fundamental components of the three systems, showing the relation between elements, energy and matter flows

In fact, the components do not function individually, they work together to carry out the principal action. Consequently, we can talk about groups of components carrying out the principal action.

It can therefore be deduced that the groups of key components which make washing machines and dishwashers work are as follows:

- control
- input/ adjustment
- washing/ distribution
- output

Having **defined the principal actions** carried out by a machine and the components that effect these actions both from a technical and perceptual point of view, **we have identified four groups of components**: a control group, an input group, a washing group and finally an output group.

Evidently, these actions are perceived by the user through the interface, the dispenser and the output group, whereas the discharge pump remains a secondary element from a perceptual point of view. Input and output are no longer properties of each component, but rather become those which act on the macrocomponents, where they will undergo the most important transformations.

This interpretation of machine function is what we have called *“logic of macrocomponents”*.

Furthermore, **the identification of the main functional categories makes it possible to underline the current redundancy in the production of components** capable of carrying out similar operations.

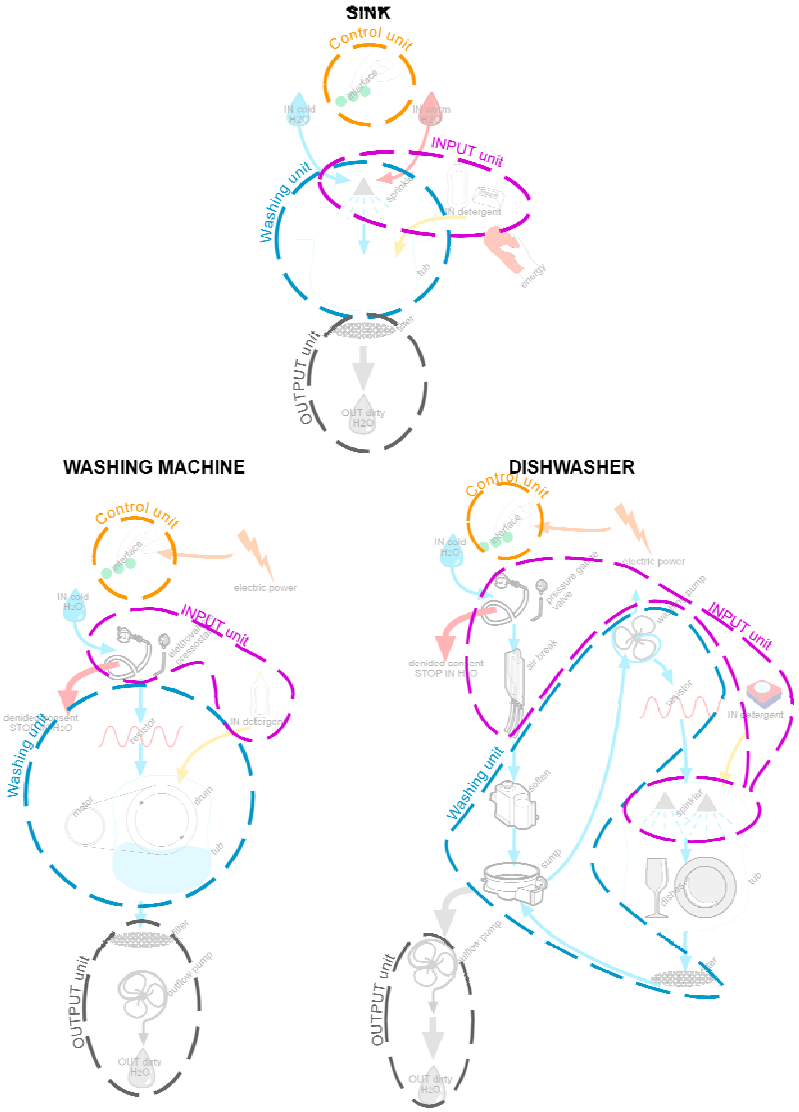

Fig. 2: Comparing the three systems can be noticed the common elements, underling the redundancy of the components of the washing system

In the specific case of white goods, it is clear that different elements are present which perform the same function. Based on the results of the analysis undertaken, it was found that it was possible to group together different elements like sprinkler, hold-up tank, filter and discharge; at the same time, the analysis also highlighted the main actions of the systems considered. The definition of the main actions carried out by the machine and the identification of the components needed in order to realize them, underlined the possibility of grouping them into families of "macrocomponents"[6], which are present both in the two home appliances and in the sink.

Reinterpreting objects according to a macrocomponent logic, it is possible to create families of products diversified on the base of the user's needs and according to household transformations in the last years. A machine designed with this vision, in fact, opens the way for a totally innovative vision of the concept of "washing machine-product". This can lead to the **creation of component families performing the same functions but with different features**, and of a machine that is designed not so much **as a unitary functional system**, **but as a product defined by individual specialized parts**. Operating in this way, home appliances won't be only simple products, standardized inside of the plant, but also objects managed during their use phase (maintenance included), in close collaboration with the buyer that will buy the necessary components in order to create its own functional system.

Taking into consideration this new logic, the research leaded to the creation of an integrable based system with some macrocomponents that can, eventually, perform the different functions of dish washing, laundry and grooming.

This kind of approach and new functional system, further than **generate operative advantages**, brings relevant environmental positive effects: **components reduction** (only the needed ones are produced, shared by different appliances), **flexibility of the structure** (by changing one of the macrocomponents you can change the general functions of the system) and **technological updating** easiness with the consequent **life extension of the product** (only one of the macrocomponents become old, not the entire product).

3. Generated advantages

This "new logic" presents some design and production advantages not only in relation to the object, but also regarding the whole production, distribution and usage plate.

The fact of designing by modules enables the production of a virtually infinite number of products of the same kind, following or creating new aesthetic expressions or offering different performance solutions with reduced costs compared with the current situation.

The transformation of the production plate could help simplify the design process, as it would not be limited to the definition of a complete individual product, but only to parts of it, and at the same time production could be outsourced to external specialist organizations, thus enabling the sharing of costs and risks.

In this case, the brand owner of the machine would benefit from the new situation, because they could share the cost of the initial investment, allowing them to focus more on marketing and service operations.

One major advantage of this kind of set-up would be the decentralisation of the manufacturing structure and the consequent possibility of exploiting the valuable know-how of

[6] Macrocomponent means a mix of relationships and components together carrying out a common function. For example, in the washing system of the dishwasher is useful to assemble resistance and washing pump in one single functional block.

local businesses such as their superior knowledge of the market and of the most suitable legislation to be applied in order to guarantee greater success of new products (flexible structure, sharing of production responsibility).

The almost global loss of the production network from the parent company and the related displacement/sharing of its “engineering/technological knowledge”, would permit the firm to focus on strengthening its brand image and brand awareness in the market. The firm would therefore gradually be transformed into a service provider in the laundry sector, in conjunction with its own products.

The **manufacturer**, lacking production lines and warehouses, could devote part of the investments, to researching, developing, innovating and running a new service which emphasizes the “macrocomponent logic”, sharing, once again, risks, liabilities and investments with the whole new system.

This “network system” operating with the local assistance centres, would provide the whole system with better efficiency.

The brand value will be enhanced and, at the same time, the macrocomponents will no longer remain anonymous but will increase in value because of having their own brand. This is perhaps the most important element of the new service, that it gives value and content to the different roles. Thus the district, the primary localization, will not be empty because the related economic value is an inseparable unit.

The maintenance staff would work in better conditions, both ergonomically and in terms of customer relationships, by being enabled to fix the machine without having to move it from its working site.

If the machine broke down it could be easily and quickly repaired by using a *courtesy module*. If there was only a minor fault the maintenance technician could carry out the repair “in situ” as is currently already the case, but the job would be much easier to carry out with the macrocomponent “in his hands”. In the case of a serious fault which necessitated a replacement part, the technician could supply the user with the substitute module and then repair or regenerate that piece back at his own shop. Finally, if there was a fault with a very expensive component it would no longer be necessary to give up the whole machine but only that macrocomponent.

Thus the macrocomponent might be dealt with all the while, in two different ways:

- either by replacing it in block,
- or by fixing it. Should the maintenance man be unable to repair the macrocomponent, the whole machine would not be dumped, only the broken part.

Technical assistance, which is nowadays demeaned because of our buy and throw away culture, assumes a renewed dimension. We can also refer to it the functional upgrading with a close relationship with the final customer.

Due to increased differentiation between product ranges, retail outlets could satisfy the requirements of a much larger group of users, managing orders more easily and generating an after-market logic, and at the same time increasing sales opportunities, thereby increasing profits. Transport from the retail outlet to the installation location would be easier and, in the case of a

fault, it would not be necessary to remove the whole machine from the premises in order to repair it.

The **end user** would profit in enjoying a great offer of products, both as far as performance and perceptive aspects. It would be easier to better fulfil and satisfy certain peculiar or particularly demanding users, than we can do at the moment.

In a sales system organized by macrocomponents, each user can go to a shop and choose the product he feels most suits his needs. This would produce a higher rate of differentiated seriality, created by the user's needs who would create his own equipment by combining different macrocomponents; but in order to make the right choice, above all he will require a greater amount of advice, for example from an energy manager[7], and assistance from the head company so as to satisfy his own customer expectations.

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Micheletti, Gian Federico. 1998. Concurrent Ecodesign, il valore del ri-uso. *Meccanica&Automazione* 44: 172-76.

[7] Energy manager: new professional figure inside of department stores. Mr. Guerrini during the meeting *"Changing the rules"* proposed this figure as the fundamental element for reducing consumes and improving performances. Wisely advised users would not risk to buy an object that could be performingly and energetically incoherent with his needs.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Crafts_Community_Design

The strategic role of design to promote local production systems

Claudia De Giorgi[1], Claudio Germak[2]

Abstract

Design can connect Crafts and Communities. Case studies from the Piedmont's region offer the opportunity to discuss roles, modalities and exportability of the model as a global/local action. Crafts, Community and Design are the three key-word to describe various design driven actions in relation to a community. Process design, in its strategic and productive forms is the medium.

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Introduction

Critical are the relations between communities and actuality, with serial and standard production methods which are now breaking on through, while trying to organise their territories. We have to go beyond the aesthetics to address the current conditions of where we live and the possibilities to build, in a globalized age, a production economy that is worthy being called culture. In sum, the stakes are the possibility to get a connection between a community, its material culture and the working procedures this community makes use of, in order to make its own living.

Objectives

The Objectives are:

- definition of approach models to typical crafts that represent diverse material cultures
- definition of accepted protocols of initiatives in agreement with the community
- definition of strategies and sustainable processes to provide this sector with autonomy, far from institutions constant assistance.

Crafts

Manufatto: manually made or even manufactured? The question might seem meaningless today, given that any craftsman, whether dealing with technology or with art, makes use of advanced technologies and works on products that were created thanks to the contribution of technology and machineries, not just one but many of them, far from the factory where each worker had his/her own task and apparatus.

In his essay *Éloge de la main*,1934, Henry Focillon claims that the hand is a universal symbol of basic men's work, *"... it grabs, it can even create, we would say it is thinking"*.

It is the tenet on which the importance of modern crafts is based: adaptation and diversification, in contrast to the standardisation of serial production. Tools, later turned into machines, have always been used to ease labor. That was precisely the task of the original lathe for woodworking in Strona Valley at the beginning of 19th century.

Riccardo Dalisi writes that *"...the hand comes from the heart: each impulse of ours activates arms and hands. Our hand is between us and the sky, between the heart and the stars. With their own two hands, people have changed the world and Giordano Bruno used to say that without the hands there would have never been any civilization."*

Our contemporary society is keen on rediscovering values in manual production and in the creation of unique pieces and, as such, it cannot discard traditional objects even in a technological future.

Crafts, the "typical and artistic" objects which we are dealing with today and which are the main topic of this research, still play an essential role in society.

They are key in a process that aims at strengthening traditional and sentimental values thus fostering a sense of belonging as well. In so doing, they attest to the central role of community and material culture.

One difficulty is to define whether these processes depend on historical and/or productive contexts.

Traditional crafts typically oscillate between isolation and reaching out to communities: this is on account of the excessive power of industrial markets and leads the system to copy its models, as long as it can. It finds comfort, however, as the market proves, in that its range of quality, reliable and long-lasting products, is keyed into direct relationships, often trough a friendship relationship with the customer.

These relationships get consolidated from generation to generation; the customer expects full responsibility from the craftsman, from the design to the maintenance of the product, and, honoured by this privileged relationship, he or she will always call the craftsman "master".

Yet typical craftsmen often complain about that when the demand decreases, as it happens, this is due to the competitiveness of serial products, as the latter are supported by a distribution chain that craftsmen cannot replicate, and a level of technological updating that a crafts workshop is not fit for.

Hence we get to the ill state of crafts: the one in which craftsmen, “try to get things done” as it is commonly said, by imitating the products that apparently rule the market, thus losing their local and special production identity. This should be the starting point for policies in support of crafts, from where to propose effective strategies.

This analysis also invites to bring the figure of the craftsman into focus.

He is originally an author and an independent figure in every specific process, very susceptible, mistrustful of his own community and third parties’ advice. Yet he acts as a mediator between material culture and innovation for the whole community.

He is not ambiguous by any means, and the analysis of the crafts system proposed in the latest conference on this theme, conversely painted a portrait of craftsman with many different facets. This is obviously not unprecedented: these taxonomies date back to the early eighties, and Enzo Mari explored them amply with a book and exhibition entitled "*Dove è l'artigiano*"- Where the craftman is (1981). Andrea Branzi also followed this avenue of research, while Ugo di Pietra carried out a series of fieldwork experiments .

More in particular, some craftmen profiles can be delineated:

The artist-craftsman. More keen on hands-on experiences rather than scholarly fabrications, Ugo la Pietra, who worked as a craftsman for long, describes the *artist-craftsman* figure as a creative person with manual skills, who cannot accept any role in the indefinite crafts sector, rejected both by art and design systems. In other words: an isolated figure.

The typical craftsman. It is the central figure for this research project; work carried out locally and with elements found on the field; he/she commands techniques, processes and languages but he/she merely reproduces past objects, without a specific project and he/she sometimes re-arranges its traditional image. A figure that has been often exploited by the touristy system of folkloristic street markets, that could not make any distinction between the independency of its own work and the will to create a community, an association, a consortium.

The industrial craftsman. He/she contributes to create an industrial product with parts that make the artefact more prestigious; or, as for Twergi, a collection of crafts products from Cusio Valleys and distributed by Alessi, which is a total substitute for the industrial process, so that skilled craftsmen can work within the company itself and focus on a part of the production chain creating a serial, more than industrial, product.

The technical craftsman. At the beginning he/she is in charge of the production of special and complex parts of projects, based on someone else’s design. Then, he/she turns out to be a service provider (models and prototypes) for the industrial system, companies and designers as well. Now he/she is interested in a new dimension: the realization of highly technological products (as for lighting technology) using serial parts, sold on the market but that can be assembled according to a person’s necessities.

The luxury craftsman. He/She works in specific sectors (jewellery, fashion, old books, restoration of precious works) where the manufacturing skills must be proportioned to the value of the artefact. Considering this highly differentiated scenario, with the preservation of some interactions, the research project presents some examples of shared action which are different in their approach, for their processes, productive and economic contexts, results and time constrains.

These regional examples have one thing in common: they are the expression of an entire community and not of a single craftsman.

Community

It may seem odd to talk about community after suggesting that one of the most important characteristics of being a craftsman is being the author and maker of the whole process, from design to product. This problem is addressed differently by those, institutions and researchers for example, who do care about crafts. Actions like Piedmont's Regional Council establishment of a brand of "*Eccellenza Artigiana-that is* Best Crafts Production" has a twofold purpose:

- it is centered on craftsmen's satisfaction, by including him/her in the most popular system.
- It satisfies the public as well, as the label confirms the quality they expect to find in a product. This is not of minor importance, conversely it is a much needed desideratum.

On a different note, processes are different if they move from the quality brand outward so as to crate a community. The actions we are interested in are bottom-up movements, with the starting point in crafts, as our research proposes. Craftsmen who gather around to form associations, consortiums, communities do not so because of any pending difficulty, but, as a craftsman from Varaita Valley used to say on his first ever community meeting *"because of the need to invest for future purposes when one can do it, not just during difficult times "*. Are we to believe him? The answer is yes, and this philosophy is in harmony with the basic rule of entrepreneurial activity.

The reasons why a craftsman needs a discussion with communities remain constant.

First, in forging relationships, communities are outlets from physical and cultural isolation, something which naturally affect craftsmen. The second reason lays in the pride of belonging to a category and sharing a project. The Italian traditional tendency to form associations, "guilds" in other words, clashes with hierarchical frameworks, and too bureaucratic and structured entities, incapable to meet individual needs. Furthermore, if the local community level enables a way to check what the others are doing, we must not forget that a certain degree of competitiveness among craftsmen is one of the system's main rules, while the association offers visibility, advertisement and ultimately communal strategies. This is the spirit according to which the main Italian and Piedmontese communities were born, even if they were initially concerned with funds allocating problems.

Communities need to share their opinions about projects, which cannot be invented. This requires an initial support from public institutions, as these initiatives must receive aid. There will not be any cultural benefit if there is no social and economic progress. Is the system sharing this vision? And, if so, to what extent?

According to François Burkhardt, crafts production methods can be re-launched on the base of recovered local identities. The problem is to match universal patterns with local culture and make them attractive. A well-known datum is helpful: a centrally planned monolithic culture, based on uniformity (industrialization), is immediately followed by a culture based on differentiation and specifity (post-industrialization). By all accounts, the opportunities are at hand .

If the community is considered as a crafts team, this is a way to present possible alternatives to serial and mass production; this will however create various responses from the craftsmen, ranging from envy to admiration.

It can be suggested that the solution is mass productions.

The "typical" crafts production can count on its own clientele, one which buys expensive but high-quality and valuable artefacts. The problem is how to reach to a wider public. The team must be investing in the research on its own origins, on projects and technology. It has to develop ideas which originate from the protection of local culture and collective interests. Schools are key in this perspective.

Design

This research assess the strategic role of design to promote the local production systems.

In particular, it presents actions related to "typical" crafts in Piedmont, where some craftsmen's communities have carried over traditions, skills and material cultures from generation to generation, despite rare occasions for innovation, visibility and market.

According to this vision, the research is the first step to investigate, analyse and promote possibilities to "create a system" where crafts, community and design coalesce.

Design, that could be the new way to "bind" them together, is the fil rouge of a tale that passes through the promotion of traditions (proper languages for local material), skills (product quality) and actions regarding the production chain.

Design plays different roles time after time: the most common is the "mediator" between the request for design by the craftsmen's community and crafts itself, when products lack a sort of identity or must be recovered (this is the case of Mondovì, Varaita Valley, Lanzo Valleys).

A more unusual role, however, is that of the "promoter" of researches generating new crafts communities or strengthening them (Turin-Marrakech, Cambiano Ecomuseum of clay, Cusio Valleys with Alessi-Twergi); and finally it is also the final target, in the close future, for local crafts productions that, once joined up in a community, can advance to the creation of a more robust identity or exportable (Castellamonte, Valenza) identity.

Some of the collaborations between craftsmen's communities and designers have created exportable models for the re-organization of processes and for the re-designing of products; some other analyse the interaction between cultures and movements towards sustainability (artefacts and food, artefacts and cultural goods ...); some others introduce environmentally-friendly solutions for the working process.

Some products are interesting because they originate from open projects, considered as "guide-lines" that the communities are free to interpret in synchrony with some shared rules: sustainable working protocols and market environments where the consumer is part of the cultural action.

Therefore the home district is the first customer for the typical crafts product: bars and restaurants, the offices of the institutional communities, shops of other typical products, like food, can be equipped with new products, thus becoming a showcase.

In the following part, a selection of case-studies in Piemonte region.

Valle Varaita

Community_DesignServiceCenter_Crafts

Craftsmen, associated to form a Community, and the local Authority make a request for Design and company assistance to re-launch local craftsmanship. The action consists of the creation of a Service Center for local and regional craftsmen.

Over 60 companies are now working with wood in Varaita Valley, mainly to manufacture furniture, doors and windows but also toys, coffins and music instruments (the famous harps by Salvi company), a supply chain system of companies cutting down trees, sawing, painting, carving, lacquering, restoring operations; they even transport and assemble furniture. An exceptional case in Piedmont and nominated Wood District in 2002 by the Regional Council of Piedmont, thanks also to the presence of a paper processing company (Cartiere Burgo) in Verzuolo.

The Valley is poised to exploit its traditional manufacturing processes again, in order to get a renovated identity for traditional wood crafts, by making use of more sustainable and technologically and culturally updated working procedures. In 1999, the local *Comunità Montana* (an association of the local alpine municipalities) in collaboration with Agenform - Consortium, was entitled to participate to a European economic project the main goals of which were technological amelioration and company logistics, activities that the Agenzia del Legno-Wood Agency was in charge of. The search for new sharable guide-lines for furniture that may combine tradition and sustainable working procedures, coordinated by the *Politecnico di Torino– Dipartimento di Progettazione Architettonica e di Disegno Industriale* –- Department of Architectural Planning and Industrial Design, and the discovery of new markets, by CSIL Centro Studi Industria Leggera – Study Center for Light Industry, provided the necessary analytical framework.

The turning point was in 2005, with the realization of a *Centro Servizi di Lavorazione Leggera del Legno* – Service centre for Light Woodworking. This center, the only on of this kind in Piedmont, was financed by European Structural Funds and it is set in an abandoned plant now organized as a campus. The area is 4,500 square meters including a manufacturing shop equipped with numerical control machines, a workshop in experimental design (with the collaboration of the Politecnico di Torino), a document center for Alpine furniture, classrooms, and finally, industrial incubators. Actually, 35 enterprises received *Eccellenza Artigiana* – Best Crafts Production brand by the Regional Council of Piedmont.

With the guidance of external advisors (Politecnico di Torino – DIPRADI for the design of new products, CSIL Milan per for marketing and distribution), in 2001 the Varaita Valley's community presented a selection of prototypes representing three new collections inspired by old styles, where design was combined with traditional material culture.

Thanks to a careful philological work, the original models were re-discovered, appropriated and illustrated. They were very different from the cliché, redundant *rustic furniture* made in pine-wood that was, somehow or another, the hallmark of the local production between the 60s and the 80s.

The old furniture in the high valley houses was extremely different, as it was influenced by a wide geographical and social area that could export and pass on typologies and languages, production and decoration processes. (In fact it is called transalpine furniture).

It is no coincidence that one of the new lines under the name of *Mezzolegno* include, (like the old wood joint technique), basic and small-sized furniture, where the main characteristics are being function and light. Prominence is also accorded to expressive details (visible joints, key-shaped elements, tension members, latch closures) as for the original models in mountain-shelters.

These furnitures were manufactured for a small series production so as to comply with the capabilities of producers from Varaita Valley. No craftsmen but small sized companies, set a

system which is open to evolution and easily usable in different home contexts, not just mountain houses.

On the contrary, the other two lines interpret *engraving and clipping* decoration systems*.*

In the first one, also called *Geometrical decoration*, the old crafts traditional engraving technique consisting of geometrical images and symbols is re-interpreted in technological terms. To do so, companies that could count on technologically advanced equipment (pantographs and numeric control machines), and Service Center, were asked to produce semi-manufactured products in solid wood with mill decorations representing enlarged transalpine symbolic themes; the panels that the craftsmen from Varaita Valley carefully assemble together.

In the second, called *Scontornatura (clipping),* the innovative idea is the re-interpretation of side decorations, a constant theme in Varaita Valley's style, to be used as a handle now, for the whole furniture. The result is a real catalogue, rich in updatable and interpretable references that was created with the aim to manufacture "expressive furniture, that can be produced on a modular basis".

A further differentiation in the production is provided by the use of solid wood, an extraordinary, changeable and living material, in its indigenous species (pine, cembran, larch, oak, cherry and walnut), not painted but treated with environmentally-friendly products only (water paints, oil, wax).

Valli di Lanzo

Community_Design_Crafts

A Community of craftsmen makes a request for Design, to give the typical local craftsmanship an identity

The history of Lanzo Valleys is one of lack of means, without any high-quality production, made up of old material cultures linked to the extraction of gneiss stone, woodworking (mainly regarding chestnut and coniferous wood) and iron working.

These activities were very flourishing in the past and now a few craftsmen continue the tradition so as to produce high-quality items that, however, are extremely similar to those produced in many other alpine valleys. This is why common goals are to be re-interpreted and a cultural and commercial reconfiguration is particularly needed.

The same craftsmen started considering this in 2005, when thirteen, now eighteen, units, which are now the High-Quality Piedmont's Crafts Products brand, formed the Artimont-*Associazione Artigiani di Montagna*- Montani Craftsmen's Association. They sought design to establish strategies, guide-lines and a new identity of Lanzo Valley's crafts.

This was the occasion to take the trditional items from those Valleys into consideration, thanks to a survey and some projects designed to support the craftsmen's community and encourage communication.

Design contribution consists of an analysis of the typical Valleys' processes, identifying their peculiar elements, strong points (the "distinguishing elements" with respect to similar working procedures in other alpine valleys) and weak points. It follows that an agenda based on "showcase products" must be included, thus advocating the following strategies:

The need to promote chestnut wood, an indigenous species which is difficult to manage (this knotty wood often cracks), is now evident, but has to be reconsidered according to the incentives (coming from the Regional Council of Piedmont) for chestnut growing in the Valleys; the expressive results of which are remarkable, where the "value of defect" is accepted. Also local companies are very helpful, in fact they are employing chestnut wood in a series of very

interesting ways - fiber processing methods that would eliminate the main defects for which it was bound to be a marginal and under-classed species: the fact it usually cracks, twists and releases tannins.

This is the first response to a Community project in favour of natural processes, to reduce working procedures and promote wood as a live material.

"Naturally", this is the temporary name for the experiment, provides products which are realized with *trunk sections and boards* looking as they were simply “sketched” or used just the way they are (for bookcase supports, for instance), with knots and parts of barks, but that may adopt new technologies (working procedures and treatments that could improve the results from poor materials).

So the level of attention is constantly high, interested in all the solutions, and in a cultural heritage that is recovered and reinterpreted in a very expressive manner: the collections of *mirrors*, minimally designed, supported by big *iron nails*, an enlarged simulation of what used to be a key - product for Lanzo Valley’s economy, where large quantities of nails were produced for a range of different uses and for military boots in particular; *hat stands and domestic accessories* in wrought iron whish are designed to look unsteady; *patchwork*, a technique that wood craftsmen are free to perform, by using the waste (fragments and small axis) to be carefully assembled, in accordance with the highly complex crafts manufacture processes and fulfilling the desire not to throw or burn anything away. The small wood, stone and ceramic objects are then used on the table and in the kitchen, created to promote local gastronomic products. These objects will be exposed in fairs, gastronomic shops, bars and Valley’s restaurants, according to a program that was drawn up together with institutions.

Valli del Cusio

IndustryDesign_Community_CraftsIndustry

Two entrepreneurs understand the Design (and Re-Design) potential for products coming from the Community’s material culture, then they commission craftsmen from Cusio Valleys with the task to manufacture and distribute them through the channels of a famous Company.

Twergi is a brand involving a large community of carpenters, carvers and cabinet-makers from the Alpine Valleys in North Piedmont; Valle Strona, Cusio and Mottarone in particular. A craftsmen’s community that has always worked to produce household and work objects with two manufacturies that had the ability to disseminate their products beyond local borders.

The first firm was Piazza Battista, founded in 1865 in Loreglia. It then moved to Pettenasco in 1888, after the mill the original factory were torn down by a heavy snowfall It thus began to get a wider range of craft products, including mainly lathe products such as pepper-grinder, mortars, coffee grinder, grater, bowls, and pots. The company with the Twergi image in its catalogues (the gnome of Walser legends) kept on working untill Ubaldo Piazza’s death, in 1972, the year the company closed down. But in 1989 a second factory, Officina Alessi, leader company in the area of Cusio and a giant in Italian design by and large, rescued the firm’s fortune by restarting the activity., in agreement with the founder’s great-grand-children.

Since that year, thanks to Alberto Alessi’s passion, the small wood or wood/metal objects (another kind of material constituting sinks and household objects, the main products for the flourishing economy of Cusio-Verbano-Ossola district) have been styled by great designers according to the spirit of Twergi and produced by the turners from Strona valley, coordinated by Piazza Battista, Alessi’s supply company for Twergi products. The products were included in the Alessi catalogue and, thanks to the company’s large distribution capabilities, they reached the whole world and they smelled like different kinds of local wood as pear-tree wood, apple-tree

wood and cherry-tree wood, and were as resistant as alder-tree and walnut-tree wood and the as fresh as beechtree wood.

These are Objects which attest to an alpine material culture that has always been shared by a whole community whose special attention for high quality production has always been remarkable. These are basic objects in technological terms, but they preserve details and features that time has not changed and if anything, improved.

Alessi, a company which is strongly connected to is roots, has made a very important choice for the current economic craft landscape. It proves that craft activities may combine with industrial processes and strategies for the future, through design mediation. In this case, craft production could be a crucial element for the industrial sector, in order to set a new global position on the market, and craft activities could also find a way to abandon the culture of dependence, at last.

Turin/Marrakesh

Design_Crafts_Community

A Designer believed that his passion for Maroccan craftsmanship could be turned into an initiative for a new inter-cultural Community of Italian and Moroccan designers in conjunction with Moroccan craftsmen.

The invitation made by Milli Paglieri in 1995 to Italian and Moroccan designers to (re)interpret Arab living style (lights, textures, furniture, decorations…) was the starting point for an intercultural project on expressiveness and semantics, materiality, and the will to recover the old Moroccan working techniques to produce the items of Hafa Collection. A collection to be “Ethnical” but immediately “cross-breed”. “Double” objects – simple and complex, spontaneous and cultivated because they inform social history and material culture.

Hafa Collection was born in 1998: some Italian and Moroccan designers and artists (Manolo De Giorgi, Marco Ferreri, Lorenzo Prando e Riccardo Rosso, Italo Rota, Jeannot Cerutti, Karim El Achak, Farid Belkahaia, Elie Mouyal, Mohamed Nabili, Charles Boccara, Massimo Morozzi, Guido Drocco, Paola Navone) were asked by Milli Paglieri to re-interpret Arabic furniture and accessories with western taste.

A real and virtual artists’ community altogether, some members of which were close and others very far away, having discussions on the best products of Moroccan crafts, one of the richest and liveliest production in African and Mediterranean areas, and studying their potential over national borders.

The Marrakech’s branch office is in charge of the objects made in Morocco – Babnet Sarl, founded in 1997 with an office in the craft district of Sidi Youssef Ben Ali, a part of the city that was consistently improved thanks to traditional craft activities that, now thanks to Hafa is becoming an on-line community.

The fieldwork conducted by Babnet consists in contracting out a number of craftsmen, finding agreements on the production and organizing it in their workshops, supporting craftsmen on the different steps of their work, and finally carrying out the quality tests on their products.

Most objects are drawing-based: the result is a mix but is never the same twice, moving from the designer’s open contribution to the craftsman’s ability to interpret a project where they are free to express their skills.

The following step, granted by Babnet, is the possibility to have tailor-made productions in every sector of Moroccan crafts, to develop drawings and projects according to the customer’s request and to cope with big orders, assuring a short-term final delivery.

The goods arrive in Turin's stocks in a few days, and they are subsequently dispatched to different destinations. In Turin the Hafa Collection products are sold in the Hafa Space, adjacent to Hafa Café, a popular milieu in the Old Roman district of Turin. There one can taste both European and Maghreb food and drinks, sitting on traditional Moroccan dining chairs and reading books on Arabic literature and history; it also organizes Arabic language and cooking courses, live music evenings and meetings to promote the culture of Maghreb. In 2001 the Hafa Hammam Collection was born; in 2006 the Hafa Hammam was opened within the prestigious NH Santo Stefano hotel in Turin, in the heart of the old city.

Mondovi'

Community_Design_Crafts

The local Community, formed by craftsmen and local authority, makes a request for Design to explore new directions to re-launch typical local craftsmanship.

In the Mondovì area, the heritage left by the ceramic production is quite conspicuous. Now picked up again by locals through different types of products, it finds applications in a wide range of media such as the re-elaboration of traditional decorative patrimony of the 19th century, clay works, training centres, and finally, important public and private collections.

Collectors, decorators and heirs of the entrepreneurs of this specific field were the first who worked on the creation of a common awereness which could give more value to this ceramic heritage. Hard work paid dividends and resulted in the release of the first book entitled "The old Mondovì ceramics" by Carlo Baggioli in 1972, followed by an exhibition the following year.

In 2006, an agreement called Manufatto Monregalese between the municipalities of the former industrial district was signed, but including also also the Municipality of Mondovì, which granting the Community requests, has been strongly committed to providing value to its ceramic heritage. This commitment will result in the building of a museum dedicated to the Old Mondovì ceramics which will open its doors in 2009.

It is therefore essential to renew the role, the outlook and the identity of the typical Mondovì ceramics. Thanks to various cultural and experimental initiatives, such as the research project which is being carried out by the Politecnico di Torino – Industrial design course – this will be possible. The course is in fact oriented toward the exploration of the first possible forms, functions and expressions through which the Mondovi ceramics will challenge themselves in the world of renewal.

In 2006 the cooperation between the municipality of Mondovì and the Politecnico di Torino - Industrial design course, academic year 2005-2006, started. As many as 150 students, coordinated by the speaker and Gabriel Adriano, were involved in the project.

By combining tradition with the new functional characteristics required by home furniture, around 40 objects were created to demonstrate the potential of the Mondovì ceramics. These projects were also the starting point for further considerations, research and deeper re-designing actions. The proposals of the students are products rich in memory and meaning, that could be produced at reasonable prices using the local traditional techniques or by starting from semi-finished existing products.

The students were highly synthetic and selective. The identity features of the ceramics could be summarized in the following elements:

one colour: blue

one form: dish

one subject (if there is one): rooster

one decoration: lace

main function: eating

An expert in traditional ceramics would be quite surprised by the disappearance of the rich decorative elements made up of animals, flowers, landscapes and characters of many different bright colours. Design had to choose the best decoration in order to strengthen the shift. As a consequence only the rooster, the most distinguishing mark in the Mondovì ceramics, is able to survive, even though sometimes the rooster is nothing more than a blue imprint marking a rapid passing.

The cobalt blue laces, which according to traditions used to decorate dishes, are made with carved sponges; they become the true features of most of the products, sometimes by exaggerating their dimensions, sometimes by reducing their presence.

Through new products, Mondovì ceramics has to cooperate considerably in order to integrate the rich local food and wine sectors, and by complying with the contemporary rituals of the consumers (food and wine tasting, happy hours…). Their role must be finessed however, to contribute to the esthetics of modern domestic space (creating or evoking relaxing ambiences, enjoying moments of conviviality...) and of the outside world (feasts, fairs or relaxing surrounded by nature). The Community becomes therefore the key to promote the typical local handicrafts, thus becoming also also become the first customer: bars, restaurants, institutional bodies, shops selling other typical products such as food and wine shops, for instance which can become the starting point for promotion.

Cambiano

Design_Crafts_Community

A Designer styles and self-manufactures handicrafts in his own furnace; this experience becomes the springboard to create an Ecomuseum working to share a culture and create a new Community of Craftsmen.

The “pioneer” is Cesario Carena, architect and furnace operator who, when employed for the construction of the new furnace, started considering clay as an expressive material to design furniture in the 80s. Carena thinks of clay and of his childhood places in his own terms, fascinated by the creative possibilities that the non-working furnace provides, which is in fact an infinite supply of raw material and interesting semi-manufactured products, and by the working furnace as well.

The individual’s experience soon turns to be, in the 90s, a group’s adventure: it includes the architects/designers Guido Drocco, Luca Barello and Simone Carena and also a former employee of the brick factory, Romano Bravo, collaborating for prototype production and small productions.

The group plays with clay peculiarities (the starting size and shrinked size after baking clay, shapes, cracks, clay powder, colours, consistency, baking phase, waste) and deepens the research on the role and identity of industrial clay products (bricks, quarries, roof tiles, briquettes, etc.), and on the possibility to use them for construction sector.

Moving from a small objects to big ones, the semi-manufactured products, part of a “product-based system”, with new additional expressive and emotional values, gain new dignity and become even more valuable.

Some new series of furniture were born thanks to the work group, one of them was “Fornace&Officina” – Fornace and Shop, the main prerogative of which was to use only elements from the construction sector: industrial clay products, iron rods to reinforce concrete, shadow

gaps and metal sheets. “rude” and poetic products that led to a renovation of clay craft products and thus promotin the unexpressed potential of that material.

The group eventually founded the association La Fornace Spazio Permanente in 1993 and bean to inform the public about their work experiences through articles and publications in specialist magazines and exhibitions/events in the evocative environment of the furnace. The Hoffmann type clay burner room where the clay products were baked was turned into a show-room to display the prototype collections, which found vast consens from the public.

The following step, in 1999, was the creation of a small craft company, Clayart, to produce, special-order, and sell selected product lines, starting from prototypes.

However the goals were more and more ambitious. The association took up a project to recover the consumed part of the clay pit; anticipating the legal norms, they invested part of their revenues to transform the consumed clay pit, thanks to the advise of a group of hydraulic engineers, agronomists, landscape architects. In so doing they recreated salt marsh ecosystems, typical of the local countryside.

The real investiture of this project, however, came about in 2000 with the foundation the Munlab-Ecomuseum of the Clay, project, supported by the Provincial Council of Turin and the Regional Council of Piedmont.

A second generation of specialists and enthusiasts altogether was to be involved thus according the association new perspectives. This new combination of material and local components gave birth to a new education-based group. In the meantime, the local *Proloco* (local associations aiming at promoting their district) associations and entrepreneurs were now the essential actors to organize complex events and projects.

The Ecomuseum was created and developed to be used as an open archive, a meeting place, an experimental and collaboration workshop where one could research industrial and craft clay products production and local “know-how”, by and large.

Next case studies that we have the aim to develop:

Valenza

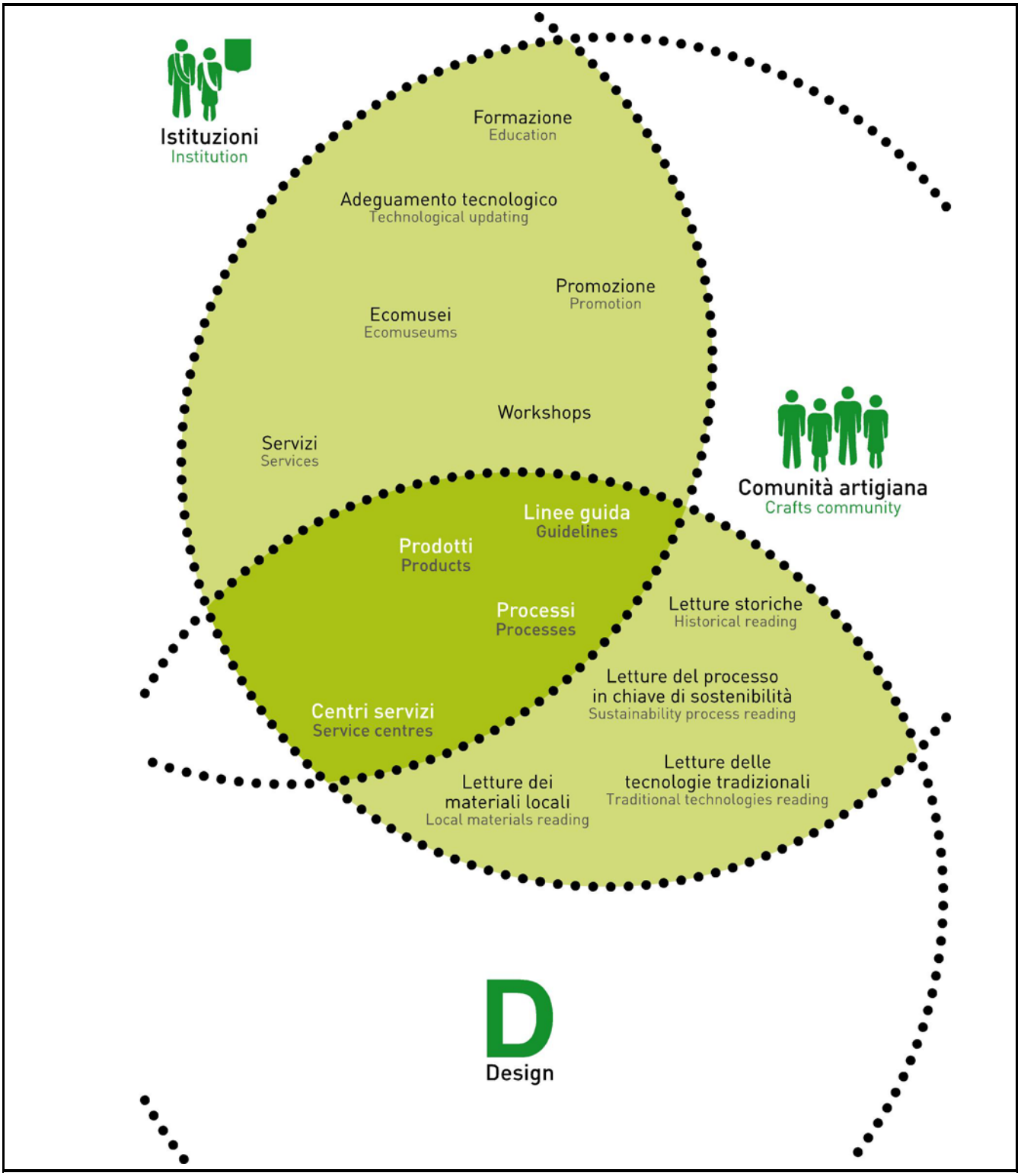
Crafts_Community_Design

Craftsmen get together in the new Community for Valenza’s Brand, to improve the traditional identity of jewelry making. Design could introduce this research into the process in a more analytical way, thanks to an open strategic project.

Castellamonte

Crafts_Design_Community

Where Crafts live based on a true icon, the ceramic stove, Design could give its contribution to exploit the market potential, perception and demand, through a new Community of companies interpreting different aspects of the same open project.


Istituzioni
Institution
Formazione
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Adeguamento tecnologico
Technological updating
Promozione
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Ecomusei
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Workshops
Servizi
Services
Comunità artigiana
Crafts community
Linee guida
Guidelines
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Processi
Processes
Letture storiche
Historical reading
Letture del processo
in chiave di sostenibilità
Sustainability process reading
Centri servizi
Service centres
Letture delle
tecnologie tradizionali
Traditional technologies reading
Letture dei
materiali locali
Local materials reading
D
Design

Valle Varaita
Community_DesignServiceCenter_Crafts

Craftsmen, associated to form a Community, and the local Authority make a request for Design and company assistance to re-launch local craftsmanship. The action consists of the creation of a Service Center for local and regional craftsmen.

Valli di Lanzo
Community_Design_Crafts

A Community of craftsmen makes a request for Design, to give the typical local craftsmanship an identity.

Valli del Cusio
IndustryDesign_Community_CraftsIndustry

Two entrepreneurs understand the Design (and Re-Design) potential for products coming from the Community's material culture, then they commission craftsmen from Cusio Valleys with the task to manufacture and distribute them through the channels of a famous Company.

Torino/Marrakesh
Design_Crafts_Community

A Designer believed that his passion for Maroccan craftsmanship could be turned into an initiative for a new inter-cultural Community of Italian and Moroccan designers in conjunction with Moroccan craftsmen.

Mondovì
Community_Design_Crafts

The local Community, formed by craftsmen and local authority, makes a request for Design to explore new directions to re-launch typical local craftsmanship.

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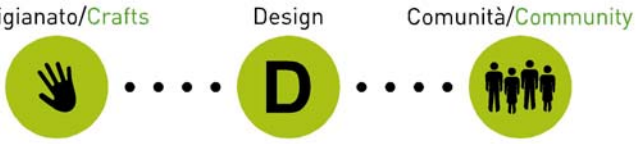
Crafts_Design_Community



Where Crafts live based on a true icon, the ceramic stove, Design could give its contribution to exploit the market potential, perception and demand, through a new Community of companies interpreting different aspects of the same open project.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design culture: from Product to Process

Building a network to develop design processes in Latin countries

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Abstract: The essay presents the results of a 2 years survey within 7 European and Latin American countries (Italy, Portugal, Spain, Argentina, Brazil, Chile, Mexico), focusing on the scientific and professional initiatives accomplished by universities and research centres in the field of design-driven innovation.

The survey shows a growing interest towards the methodological aspects of design by the observed actors and urges the formation of a "Latin network" aimed at experimenting proper design processes for Latin countries' socio-cultural and productive systems. The basic idea is that design culture, considered as a process culture, has relevant advantages in the actual relationship between production and consumption:

- Offering design a mediator's role between the crucial knowledge for sustainable development: economy, art/creativity, technology and humanities;
- Producing a "phantasmagoric" capacity (the possibility to visualize and share what is immaterial and upcoming);
- Mediating between the productive and consumption systems' interests.

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1. Origins

Design culture is originating and developing in Latin countries around the problems concerning artistic design for industry, in a context featured by the relevant and systematic use by the industrial sector of practices and skills provided by the system of professional techniques and arts, commonly inclined to develop a project vision as a result of the product culture. The contribution of the academies of fine arts, as well as the schools of architecture, and the morphological, spatial and perceptive research has prevailed and conditioned great part of this culture, outlining the profile of an artist-designer oriented to a design approach traditionally linked to the productive and industrial realities that, in turn, have frustrated a progressive and continuing permeability.

Tracing the origin of design education in Latin America, Silvia Fernández establishes a strong connection between the rapid economical growth of the 1960s and the development of training experiences: “during the 1960s and 1970s, the economies of Latin American countries, whether socialist, liberal, or conservative, generally reoriented themselves towards a policy of import substitutions and industrial development. Design was placed within this overall industry policy. The creation of the first institutions for design education proliferated” (Fernández 2005, 3). According to the author, the process of institutionalization of the discipline, closely related to the influence exercised on the local culture by the Hochschule für Gestaltung (HfG) in Ulm that “offered in this context an operative, concrete answer to the challenges of industrialization” and “championed the insertion of design into the industrial process” (Fernández 2005, 4), knew a new season in the 1990s, still active nowadays. On the other hand, the origin of the first design degree courses in Latin Europe is even younger and dates back to the last decade of the XX century.

2. Breaking elements of the historical unity

Starting from those days, the development of high level training for design in the universities of these countries has been associated to the need to rearrange, adapt to the local cultural and productive system and develop a more systematic and precise knowledge about the design-driven innovation procedures. At the same time, industrial production, primarily focused on raw material extraction and commodities production, has been influenced by the risk resulting from the development of Eastern countries (above all Russia, India and China). This obliges us to reconnect design practices to industrial and economy management, starting from the development and the possibility to share innovation models that can mainly focus on cultural diversity and on the different kinds of local production procedures.

Signs of this change emerge from the analysis of the initiatives that characterised the recent activity of the universities and professional design systems in the Latin countries.
The birth of institutions that wilfully integrate research-education word with productive-experience one and the rise of scientific contributions and specialist training programs that focus on this topic are only two among other elements clearly connected with the transit of the institutional, professional and social attention from the product to the process culture. A process that takes advantage of the possibility of valorisation and comparison permitted by the growing diffusion of intellectual exchanges between training realities, all over the world.
The rise of professional associations, networks and institutions assembling subjects in charge of making quantitative/qualitative analysis and researches connected with the productive reality represents another important sign to value this evolutionary process.
At the same time, the diffusion of European programs for the international cooperation towards innovation is an important element for the examination of the process: they have recently been and are a way to legitimate an international step towards the design process culture, but also a methodological practise for the subjects involved. The nature itself of the co-financed programs as a matter of fact imposes a high concentration on the organizational, control, and coordination

process; a strong attention to the temporal and the hierarchical articulation of the output; and finally a tension towards the documentation of the process for the diffusion of best-practices.

In addition to these “breaking” topics, we can say that today there is a global awareness of the fact that design cannot be pushed by big corporations anymore (such as the historical model of Olivetti factory in Ivrea, Italy), neither by top-down politics for organically oriented economical interventions. The actors involved have to recognize themselves as a bottom-up system in which the power of design and designer has to be auto-created.

The “breaking point” of the original state emerges from the following scheme, result of the survey that has been carried out for the last 24 months of the initiatives pinpointed by many universities and research centres from several European and Latin American countries, here by us represented. The scheme summarizes the development actions and points out possible opportunities of collaboration and real instruments put to use to create a system of shared values and practises.

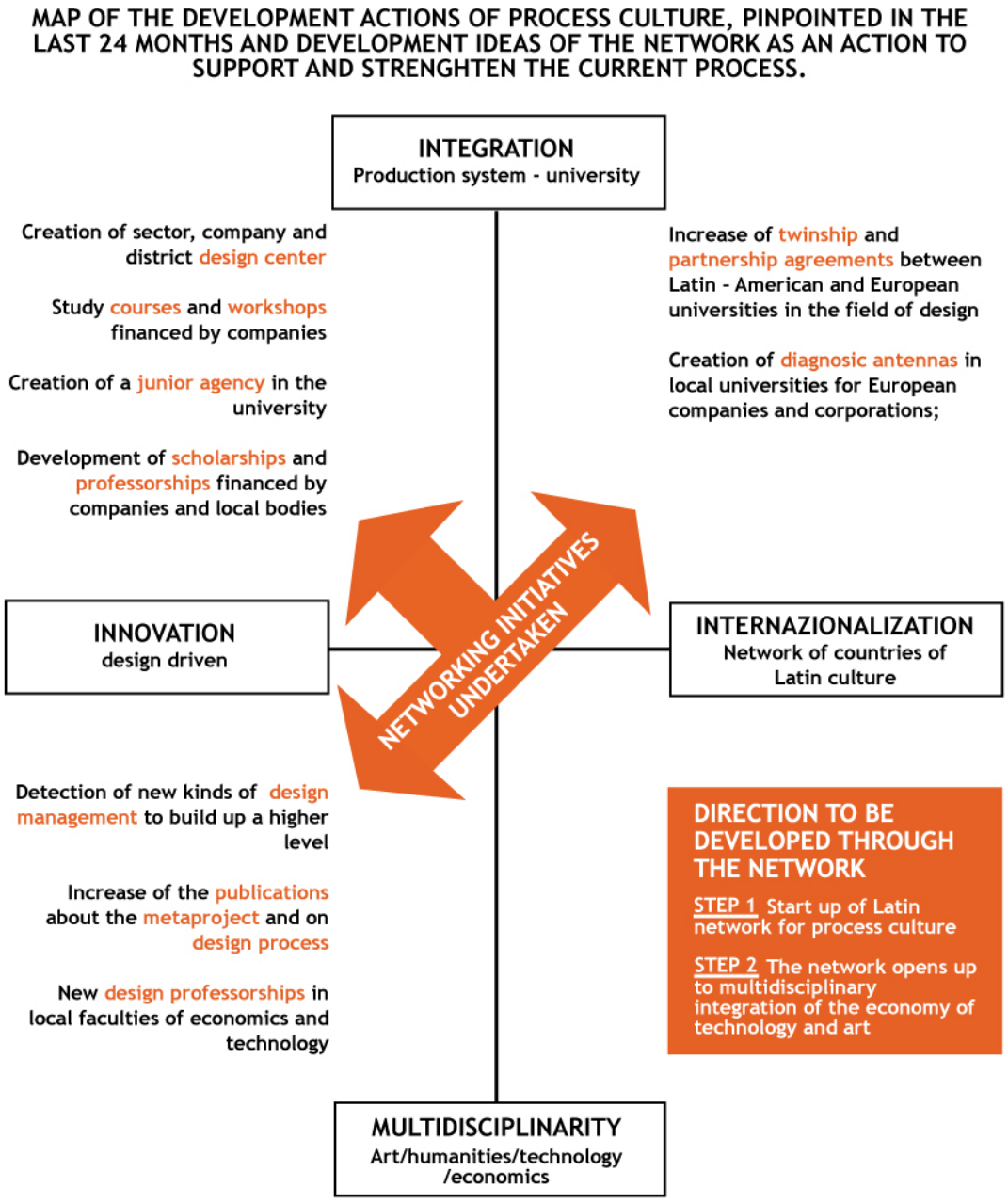

Fig. 1: Map of the development actions of process culture, pinpointed in the last 24 months and development ideas of the network as an action to support and strengthen the current process

The study implied a general overview of the main initiatives that have been divided in thematic areas based on the directions of their development. Some of the case studies have been selected as a necessary exemplification and documentation of the state-of-the-art of the research in the field of design and its future directions.

3. Integration – innovation area

Includes initiatives in which design has had a mediator role between research-university realities and the productive system. Thanks to its capabilities of transforming general knowledge into “applied research”, design has contributed to the innovation of products, services and communication instruments for businesses and agencies, helping connecting the world of research and professional consulting.

The comprehension of such ability by the productive system has favoured the birth of entities linked to universities inside businesses, production districts and associations involved in the fields of research, formation and promotion. In such environments services and laboratories are offered, in a complementary or alternative way, to implement the formation of the students, promote a design-driven process of innovation, support activities for the design-culture consolidation through exhibitions, publications, conferences and the encouraging of cultural exchanges.

Regarding Italy, we can approach the cases of POLI.design, consortium of the Politecnico di Milano that has been promoting the birth of business design centres since 1999 through the union of university and companies (Milan’s Creative Academy - Post-graduate studies school of the Swiss luxury group Richemont -, L’Oreal’s Corporate University in Rome and Gardesa research centre, a company specialized in doors and security systems), and that of the pioneer CSM (Centro Sperimentale del Mobile e dell’Arredamento), founded in Poggibonsi (Siena) in 1982 with the aim of providing the sector with a support in terms of research, innovation and professional education.
In these two cases, the design centres play a fundamental role in two directions:

- to organize activities connected with company businesses;
- to serve an homogeneous type of enterprises in terms of district capabilities.

Further exemplifications that clarify the ways of interaction between product system and university through the birth of different kinds of design centres could also be found in the Latin American context: Porto Alegre’s Escola de Design Unisinos, born from the partnership between the Universidade de Vale do Rio Sinos and POLI.design, can count upon a business consulting branch, joined with those of education and research; this academic institution, in collaboration with POLI.design, has then promoted the birth of the Cini Design Center, a research and development centre working inside the Madesa group that operates in the furniture field. Always in Brazil, the fashion and textile district in the region of Rio de Janeiro can count on the collaboration of the Cetiqt (Centro de Tecnologia da Indústria Química e Têxtil) that, in a singular structure, offers a Faculty and a Design institute, whose objectives are of satisfying the emerging needs of the textile chain production through the use of high technology.
In addition to the abilities mentioned above, design centres can also have the function of promoting design culture publicly; a model well represented by the CMD (Centro Metropolitano de Diseño, Buenos Aires). This institution assists the city’s enterprises, designers and entrepreneurs with the aim of improving their competitiveness through innovation-oriented initiatives, the application of strategic-design processes and the integration of the project in the production reality, activities well documented by publications and international conferences, among which it would be worth remembering the 2005 edition named “Diseño estratégico pyme”.
Portugal’s case study, that in 2007 saw the birth of ID+ (Instituto de Investigação em Design, Media e Cultura), represents a paradigm of the way different typologies of research and innovation centres can finally converge into a single platform of common strategic objectives.
Forces operating in the design sector in Porto’s and Aveiro’s universities have joined the CPD (Centro Português de Design) in the establishment of ID+, whose principal aim consists in the research and creation of instruments useful to the weakening of the concept of “symbolic deficit” of Portuguese artefacts (the entire range of products, systems, and services), assuming a sustainability logic as ethical reference. The structure involves actors of different nature, in the attempt of establishing a strong link between the world of experience (design practice) and that of

research (university). Appealing to the problem solving, communication and design dimension, the project tries to find the major number of alternatives for the actuation and the symbolic reinvention of Portuguese products through the creation of project groups organized on a multidisciplinary platform.

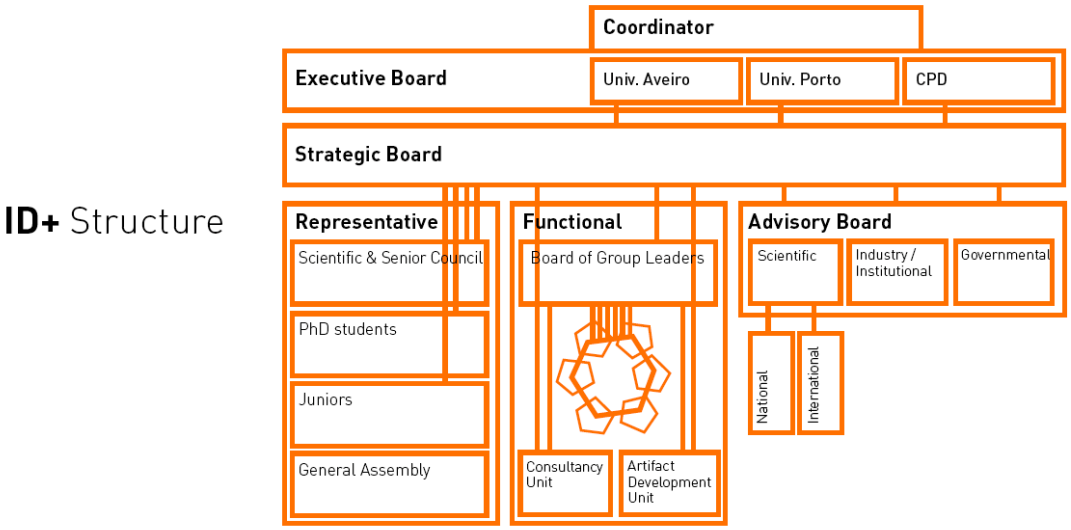

Fig. 2: ID+ Formal structure (ID+ 2007)

Along with the birth of design centres, the constructive synergy between the world of production and the academic reality has implemented projects and laboratorial activities inside the universities financed by private enterprises and public agencies. These enterprises operate in both service production and distribution sector. As examples we could mention (limiting ourselves to the co-authors of the following paper):

- Coza, home furnishing company, or Cave Gaisse, in the wine sector, which have collaborated in the 2007 and 2008 editions of the Design Atelier (second year) of the Escola de Design Unisinos, Porto Alegre;
- Cean spa, operating in the conception, project, commercialization and administration of supermarkets, has an active role in the Industrial Design Laboratory (2008) in the Eco-compatible Product Design Degree Course of the I Faculty of Architecture of the Politecnico di Torino;
- The housing chain store Emmelunga, which in 2006, also through a contest, established a synergy with the Degree Course in Industrial Design of the Faculty of Architecture of the Università degli Studi di Firenze.

In other cases, the synergy between universities and productive system has ultimately given start to the development of scholarships and professorships financed by enterprises and local agencies.

4. Innovation - multidisciplinarity area

Design, being a young and academic history-lacking discipline settles itself between four traditionally hardly-interacting knowledge systems: humanities, technology/engineering, art/creativity, economy and management.

Its attitude in catalyzing contents and synthesizing their effects in terms of form, function, value and meaning for the final user represents an essential component and constitutes the object of a growing number of studies focalizing on the so-called “metaprojectual” phase of the design process.

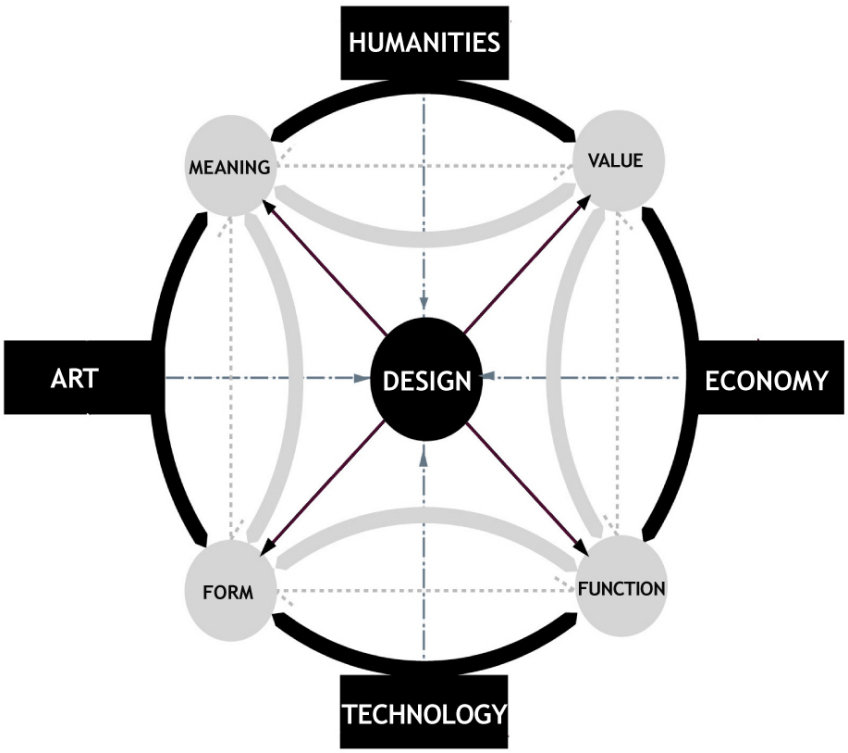

Fig. 3: Design as mediator between knowledge systems

“The metadesign is a place for reflection and elaboration of the project’s content. It originates from the necessity of multidisciplinary knowledge which will maintain and guide the activity of the project within scenery in constant mutation” writes Dijon De Moraes in his text “Limites do design” (De Moraes 1997/2008). It could be considered “the design of the design”, the phase during which we shift from a wide range observation of reality to a model of it on which it could be possible to operate projectually.
Starting its development in the 1990s, with market’s globalization and the turbulence of the context in which production and innovation processes were born and breed, the reflection on metadesign has produced a great number of publications. Other than the De Moraes’ text mentioned above (always limiting us to the co-authors of this paper and the years 2007-2008), it seems significant for us to point out the almost contemporary publication of:

- “Design e innovazione” (Celaschi, Deserti 2007), which elaborates the articulation in phases of the design project, giving particular attention to the phases of observation of the reality and the constitution of a model;
- “L’uomo al centro del progetto” (Germak in course of publication), which gathers different essays centered on the role of the designer during the process of innovation.

Metadesign is also subject of study in all of the observed countries. The survey has in fact detected the existence of courses specifically dedicated to metadesign (for example the “Metadesign Laboratory” of the Degree Course in Industrial Design of the Design Faculty of the Politecnico di Milano, the module of “Innovation, Management, Communication” of the Eco-compatible Product Design Degree Course of the I Faculty of Architecture of the Politecnico di Torino...), but also the

great emphasis given to the “design of the design”, in the field of degree courses and didactic modules in industrial design (for example the Industrial Design Course of the Universidad Empresarial Siglo 21, Cordoba, Argentina…). In some cases, the articulation of the plan of studies retraces the phases of the metadesign, progressively focusing on the methodological setting, on the “investigation” techniques, information modelling, the project and its representation, with the aim of conferring the student an “autonomía frente a un problema de diseño, siendo capaz de coordinar y tomar decisiones, un estratega que domina integralmente las variables de un proceso de diseño. Capaz de reconocer e integrar conocimientos y a otras disciplinas, aportando con desarrollo concreto a los desafíos de comunicación, gestión, forma y producción” (Pontificia Universidad Catolica de Chile. Formative objectives of the “Licenciatura del Diseno”. http://www.puc.cl/dno).

In the laboratory-oriented subjects, it is easy to find a particular and shared setting of the initial phase: the starting point of the project that is presented to the students is not a structured and circumscribed brief but rather a “problematic field” of vast entity. The initial “problematic field” is therefore broadened and enriched (a humanistic approach in opposition to the “elaboration” proper of a more rationalistic approach) to be simplified afterwards through a progressive re-modelling of knowledge: the prevision of intermediate project steps such as the “tema general”, the "concepto general” or the “scenario” is commonly used.

This attitude to the initial problematisation (which is generally dedicated the 50% of the design time) and to the self-individuation of the design theme, legacy of a historical gap in the link between design industry/world, is to be considered as a particularly significant attitude in the actual market’s context that shows a business world always more oriented into the externalization of the “research for a sense” to external consultants.

The holistic vision of the profession of the designer that derives from these reflections sets the problem of a redefinition of the denomination of some degree courses and titles of the polytechnic matrix. The “titulación” of “Ingeñero técnico en Diseno Industrial” had for example acted on the perception of the student (as detected by Malaga University’s board for Innovative Education), putting in perspective its commitment and interest towards the disciplines of aesthetical-critical, graphic and artistic-expressive matrix. The board, in observance of its denomination, has activated a series of innovative education measures with the purpose of encouraging student’s motivation through the construction of an interactive *disenoteca.*

The valorisation of design’s multidisciplinarity and capacity to aggregate and that of the designer’s strategic mission develop in a much more advanced way in the field of high education, where the promoting institutions are more autonomous and the orientation towards the market is stronger.

The very own Universidad de Málaga is taking care of the module of “Identidad, Marca e Imagen Corporativa” of the Master Internacional en Direciòn de Comunicaciòn organized by the Universidad Catolica de Murcia, which has students coming from all the principal Latin American countries.

For example the Master in Design of the Università degli Studi di Firenze, the Master in Strategic Design of the Universidade de Aveiro, the Master in Design Strategico of the Escola de Design Unisinos of Porto Alegre, the Curso de Pós-graduação em Gestão do Design nas Micro e Pequenas Empresas of the Universidade do Estado de Minas Gerais, the Maestría en Diseño Estratégico e Innovación of the Universidad Iberoamericana of Mexico City all have a management and strategical orientation.

Designers’ capacity of assuming the role of link between the business dynamics, the socio-cultural processes and the client’s desires has made possible for them to be recognized by agencies and research structures in the technological and economical fields, which have opened their very own design courses and teachings.

Representative examples of this fact are the courses instituted by the Università Bocconi of Milan (for example the masters in Fashion, Experience & Design Management, now at its eighth edition) or the program of the Gestão do Design held by the Senai (a Brazilian industrial association) in 14 states of the Federation, counting over 40 “Núcleos de Apoio ao Design” (NAD), and in 13 different industrial sectors, from the production of furniture to the industrial automation of chemical industry.

The presence of a design area in a business-oriented university such as the Universidad Empresarial Siglo 21 which general objective is “Formar líderes emprendedores, capaces de asumir posiciones de responsabilidad en la creación y distribución de la riqueza. Líderes que

contribuyan a aumentar la eficiencia y competitividad de las organizaciones, y que aporten a lograr que el país sea cada vez más desarrollado, ético, solidario y equitativo" and "Desarrollar la capacidad de resolver con investigación, los problemas que el país demande a la Universidad" (Universidad Empresarial Siglo 21. Mision de la Universidad. http://www.uesiglo21.edu.ar/Canal) is also of significative relevance.

5. Integration - internationalization area

The exchange of experiences, contents and competences between universities, professors, researchers and enterprises belonging to different national settings of the Latin area has favoured reflections on the states identities, geographical areas and actions in favour of the local development.
The increasing number of partnerships between Latin American universities and European ones can be seen as a first signal of such trend: it is significant the example of the Escola de Design Porto Alegre, born by the partnership between the Universidade da Vale do Rio Sinos and the consortium POLI.design (Politecnico di Milano) in 2005.

The progressive process of internationalization and the creation of partnerships between the Latin countries is therefore confirmed by the increasing mobility of students, researchers and professors; a process that encourages the sharing of academic models, research themes, cultural activities and professional careers. Exchange programs active at different levels of the students' career are available in all of the universities involved.

Design's role of cultural mediation in the creation of partnerships is finally evident in the constitution of associative agreements between universities, local agencies and productive systems in the pursuit of local development and valorisation of the single realities.
A shared desire to compare "las dimensiones de lo local y lo global provejéndole al diseño un espeso y fèrtil campo de validación: ser vehículo cultural en el mundo virtualmente uniformado por la tecnoclogía y compulsivamente regido por el consumo" (Cervini, Kayser 2004) is getting increasingly noticeable.
With this in mind, it seems useful to mention a few cases witnessing how integration systems at a supranational scale can contribute in providing incentives for valorisation projects at a local scale.
The first example is linked to the growing associative phenomenon that represents one of the most crucial and distinctive topics of the contemporary debate in regard to the recognition of the design's world professionalism. The ALADI (Asociación Latinoamericana de Diseno) is the only supranational design association in South America: it reunites representatives of training institutions and of professional, business, promotional and cultural associations, both of the private and public sectors. It was born in 1980 as "entidad que agrupa y representa a los diseñadores Latinoamericanos que promuoven la insitucionalización do Diseño Industrial Como disciplina tecnologica necesaria para el desarrollo social ecónomico y cultural de la región" (ALADI. Acta de Constitución. http://www.aladi-design.org/Historia) with crossing objectives developing at a political but also institutional, formative and communicational level. As years went by Uruguay, Paraguay, Dominican Republic, Porto Rico, and Bolivia (as last in 2007) joined the original group formed by delegates from Brazil, Colombia, Costa Rica, Cuba, Chile, Ecuador, Guatemala, Mexico, Nicaragua, Peru, and Venezuela in the composition of a complex map of territorial realities. Today it promotes a great number of initiatives including conferences, exhibitions, contests and even teaching programs and research projects.
To the strength which is implicit in the associative action, international research projects are joined demonstrating the extent of the synergies in design culture. We could name two examples taken from the activity of an institution that has historically developed a particular competence in the creation of communitarian and, in general, international projects. Between 2004 and 2007 the Degree Course in Industrial Design held by the Università degli Studi di Firenze, together with Florence's Isia, the II Università degli Studi di Napoli, the Ecole des Beaux Arts de Marseille and the Institute des Beaux Arts de Sousse has started the project "Abitare Maditerraneo I e II" with the

aim of contributing to the creation of an added value for the local manufactures in terms of competitiveness and starting from the definition of a specific identity. The project has counted the collaboration of institutional agencies (European Union and different Regions) and business enterprises located between Italy, Spain, France, and Tunisia, joined by didactical structures. The project has implied two kinds of relapses:

- direct (the definition of a “Manifesto dell’Abitare Mediterraneo”; the realization of about 30 prototypes developed by the joint of enterprises and designers from the two sides of the Mediterranean; the publication of a market study about the potentials of a Mediterranean trademark and products);
- indirect (the work on an alternative concept of Mediterranean based on the desire of a confrontation of people, cultures, development models; the creation of lasting relationships between the students involved; the confrontation between the project schools).

The same Graduate Course, in collaboration with San Paolo’s Universidade Presbiteriana MacKenzie and Brazilian ONGs operating in the waste recycling sector (Aldeia do Futuro, Monte Azul, Ricicla-Florescer, Arrasto), has therefore activated in 2004 the “Design Possibile” project (actually in development). The objective was reached through a complex methodological procedure that started from the creation of mixed Italian-Brazilian groups of students and made it to the realization of prototypes even contemplating the hypothesis of a distribution of these products. Finally it consisted in the helping of Brazilians ONGs operating in the sector of the recycling of production waste (jeans, tissues, wood, PVC, marketing banners) to widen their market through design.

6. Internationalization - multidisciplinarity area

Considering the documented and increasing intensity of exchanges and collaborations between the cited organizations, the formation and consolidation of a cultural bridge between the main Latin European and Latin American countries appears to be highly appropriate: a Latin net could afford in a systematic and conjoint way the topic of *design process culture*.

Despite the existence of studies and formation/conference practices promoted in the last 20 years by universities and design centres of the considered countries, these came undeniably late when compared to analogous initiatives held in the Anglo-Saxon world.

The different socio-political and economic history of the UK and of many Anglo-Saxon countries in respect to Latin countries have stimulated a much more precocious maturation of the methodological culture and a diffusion of it on a global scale, as the only available tool.
The manufacturing boom of the end of the 19th and beginning of the 20th century put into motion modern benefits and constraints for living and working. Disciplines such as architecture, town planning, engineering and product design, whose growth has always taken place alongside the industrial development, began to tackle new types of problem-solving past traditional artefact making.

The first well known public evidence of the “design methods” studies dates back over 40 years ("The Conference on Systematic and Intuitive Methods in Engineering, Industrial Design, Architecture and Communications" organized in 1962 by John Chris Jones and Peter Slain). Since then, the number of studies has increased and expanded, giving origin to a multiplicity of approaches and methodologies that share the belief in a pragmatic and rigorous method to solve problems through design, and that are commonly embodied in the generic definition *of Anglo-Saxon design process culture* (also considering the common linguistic substrate of the proposed definitions and practices).

The cited approach has generally been applied also within Latin American countries, due to the strong US influence and according to the rationalist design education of Ulmian derivation.

In the absence of autonomous and codified methodologies, the design process has absorbed, also in the European Latin countries (characterized, as Latin American countries, by a late industrial development in respect to the UK), an Anglo-Saxon setting.

The relationship strengthening between the Latin countries of the European and American area seems to be a vital opportunity for a *choral confrontation* with the “English speaking” design process culture, to understand the different theoretical and practical strands and common guidelines and characteristics and, alternatively:

- to verify the possibility of an aware adhesion of the Latin countries to the already diffuse methodologies;
- to distil, from the analysis of the studies realized up to now and of the empirical experiences accomplished by the different actors of the net in an independent or aggregated way, the characteristics of a possible common formulation of the Latin design process.

This unifying objective is extremely topical if considered as a singular case of “post-colonial study”, prospecting a progressive moving closer and “familiarisation” of countries historically playing the role of colonizers and colonized and their “coalition” in the presence of a transversal cultural *colonization* by the design process culture of Anglo-Saxon setting.

The hypothesis that supports the formation of the network (and is partially supported by the observation of the cited cases) is that it is possible to find some common elements in the design process approach shown by design professional and researchers of the Latin American and European countries. Constitutive and originative components of the mentioned approach could be inferred by some peculiar characteristics of the observed countries, such as:

- the attitude to syncretism, particularly showed by “young” multiethnic countries, such as Brazil (or Cuba and most of the Caribbean countries);
- the culture of industrial symbiosis and collective identity of the industrial clusters and local productive systems, particularly developed in Italy;
- the prevalence of a humanistic approach to the project and the emphasis on the initial stage of the design process: the "critical problematisation” (already highlighted in this paper with reference to Latin American cases) that considers the so-called “brief” as a cue for the opening of an enlarged problematic field.

The ideal scenery to which the proposed network project tends is the joint construction, in the long term, of a peculiar design process culture of Latin setting.
Possible instruments for the realization of the scenario are:

- the creation of a virtual expandable network for the exchange of information/experiences by researchers from the European and Latin American countries;
- the foundation of a magazine (printed and online) to collect the researchers’ contributions;
- the establishment of a programme of meetings/conferences to allow the frequent relationship between people and keep alive the debate on common issues through periodic deadlines for the delivery of the research advances and the celebration of the results.

First concrete result of the systemic and transnational knowledge-sharing is the birth of the Design Process Latin Network, to testimony the high relevance of the proposed issues.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Ethics and aesthetics in industrial production:

Possible ways for the design in this new century

Dijon De Moraes[1], Clarice Figueiredo[2]

Abstract

Many researchers engaged in the issue of industrialization, the environment and consumption emphasizing the importance of consumers to the success of the environmental sustainability of the world.

This reality leads us to believe that a new aesthetics related to the social and environmental sustainability of the industrial production will occur through many ethical and behavioral changes of the current population and consumers. This collective change of behavior will turn into a new reality of an aesthetic of new “clean” products which will work as an ethical reference to a new aesthetic formal reality.

By accepting the products developed inside of this model in a pro active way, the consumers would legitimize a new possible aesthetic product in the name of a sustainable planet. Moreover, the consumers will have done their share in the trilogy of production, environment, and consumption.

Keywords

Ethics and sustainability; Ethics and consumption; Ethics, aesthetic and environment.

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1. Introduction

Since the nineties, questions related to environmental sustainability have been considered as an important topic for many researches. It makes the thoughts about this subject pass through different scopes of knowledge with distinct interest and approach. The current approach concerning the triad production, consumption, and the environment intensifies significantly when the relation between the quick technological evolution, the raw material with free movement, and the globalization phenomena or the increasing of production in many countries are considered. According to Manzini, "man's capacity to manipulate materials and information never been so deep and wide as at present, but the total result is the production of an artificial environment, each time more alike with a second nature in which the laws are not clear yet, but mysterious. All of this induces a revision of this artificial world when grounds for reflection are inserted in the culture of the project and industry" (MANZINI, 1990)[3].

One attempt at rapprochement in this sense would be the insertion in a pro active way with the consumers to the debate about the socio-environmental sustainability, recognizing that they are the participants in the results that is actually known about the environmental impact. In fact, a lot has been done to actually desensitize the consumers to denied products that come from a polluting production. In the same way, a lot of effort was wasted looking for the spread of consciousness consumption. Indeed, a lot has been done looking for the control of the discardable after the use of the goods semi durable and diary household consumption.

But the actual stage that the world industry is presented as a quick productive dissemination and the significant increase of the consumers' number that requires other actions must be applied, while looking for the sustainable preservation of the environment since the increase of the consumption from the Newly Industrialized Countries population, and in particular the population from the Southern Hemisphere, has to be recognized.

In the same way, it is believed that the socio-cultural influences has an important contribution to the industrialized products conception, weather every product unconsciously or not is a product from the interaction of the actors involved in the conception of the art crafts with the socio-cultural reality. This fact is more clearly defined when we turned back to the popular art crafts production. Indeed, the art crafts have been the result of man's conviviality with their autochthonous culture, traditions, beliefs, and religiously processed into spontaneous material culture.

In the material culture that comes from the industrial culture, even though in a tacit way, it is also possible to observe the culture influences specially in the urban territory thru the huge scale of industrial products. In this way, the Design as discipline that consider the aesthetic as part of the contemporary industrial production will be able to use its attributes as a strategic discipline and a tool of projectile culture to insert to the consumers the possibility of absorption of new aesthetic that consider the ethical environment principles as aesthetic reference of the industrial production to the third millennium.

The aesthetic has been understood as a reflex of man's behavior as a social person, here understood, as a collective group about their conduct and human attitude. It means that the ethic that is able to influence the aesthetic of our material culture. So that, it is possible to be said, for example, that exist a military, native and religious attitudes and behavior of different types of social groups.

Moreover, through ethics it is possible to feel new types of aesthetic sensitivity not only as images, but also as a metaphor of a conjunct full of meanings or concepts and significance or

[3]MANZINI, EZIO. *Artefatti*: verso una ecologia dell'ambiente artificiale. Milano: Domus Academy, 1990, p.50.

values with which companies can associate. Because of that, aesthetic formal codes offer recognizable styles, as example Bauhaus, Streamline, and Ulm. They had a strong theory, culture, behavior basis concepts which are in accordance with its aesthetic, what this means is that that they used to follow behavioral esthetic and conduct that they believed and defended.

Methodology

Through the dialectic method's affinity with the complexity phenomena and its laws as "reciprocal action" where everything is related and "dialectic changes" where everything is processed are considered as references to this study. "Therefore, to the dialectic things are not analyzed as fixed objects, but in movement nothing is over, always transforming and developing. The end of a process is always the beginning of the other.

On the other hand, things do not exist isolated, unconnected with each other, and independent, but as a total, together, and very consistent. Not only the nature, but also the society is composed of objects and phenomena are organically connected to each other, interdependent one on the other at the same time, conditionally to each other. Stalin (In: Politzer et al., s.d.:37) refers to this interdependence and reciprocal action as the fact of why that the dialectic method considers that any nature phenomena can be comprehended when it is observed separately or out of the phenomenon around. Because any phenomena from any nature can be converted in and against sense when it is considered out of the conditions around. When it is out of these conditions, on the other hand, any phenomena are possible to be soluble with the phenomena around. When it's considered as it is that are conditioned thru phenomena around" (MARCONI e LAKATOS, 2003)[4].

Text
Modernity and Industrialization

It is impossible to despise the industrial production which is inside of the modernity context lived has become one of the biggest problems to the environmental sustainability of the XXI century and because of the modernization of the XX century became a synonym of industrialization, but no method was introduced in the modern projects looking to decrease the consequences that the development brought intrinsic to itself. According to Bonfantini, "our environment today is composed essentially of colonized and transformed territory due to the good and to the bad by man, their activities, goods, goods market, industries, machines, and the garbage are types of pollutants, weather desired or not. But, all this came from the human colonization and in the end, the whole world is made of arts and crafts" (BONFATINI, 2000)[5].

But if the contemporary world was also made by arts and crafts and industrialized products that for some way it completes itself, we must know that the destiny of the waste from the development of the industrial production was not considered. The result of this world's modernization processes is the good and bad things that were brought through it to the humanity of the XXI century. As the modern legacy remains through the technological evolution and through the quick productive spread around the world, however, some action is necessary to maintain in an acceptable way the world's progress through industrial development and environment.

It is interesting to observe that the modern, rational functionalist project that is in the logic of the progress established with its formulas pre dimensioned should have a better organization of the social order. As consequence, its benefits would be spread out to the humanity. This

[4]MARCONI, Marina de Andrade e LAKATOS, Eva Maria. *Fundamentos de metodologia cientifica.* 5ª ed. São Paulo: Ed Atlas, 2003, p.101.
[5]BONFANTINI, Massimo. *Breve corso di semiotica*. Napoli: Edizioni Scientifiche Italiane, 2000, p. 09.

project with its structured and consistent concepts guided the world's industrial and technology development of the strongest countries in the Occident, as well the communist countries during the XX Century.

The control under to the downfall of the humanity destiny made part of the modern project. "According to Jeremy Bentham and Michel Foucault the flow under to the downfall of the control and the fact to turn the action to supervise a professional activity of high quality were things that unified many modern inventions, such as schools, military places, hospitals, psychiatric clinics, hospices, industrial parks and jails. All these institutions were factories, and since all the factories were localities with structured activities seeking looking for to obtain pre established results" (BAUMAN, 1999)[6].

However But the modern project with predictable control about the human destiny looking forward to a better life seems to not have accomplished its whole mission. The dream of a modern world following a clear and objective logic pre established where all the people or a big part of the people would have access to a better life through industry and technology did not work. Nowadays it is clear to observe its disability to not have expected the effects and consequences of the huge industrial production the environmental problems. It is interesting to remember that presently, nowadays because of the quick spread of the world productivity, the environmental problem and the unbalanced nature has not localized interest in everywhere independent of location and geographical position in an entire context way.

Therefore, this new reality contest the objective and linear modern logical showing that the consumers were not called as participating in the world industrial destiny, even though having been the users of disposable objects and nondurable goods. It means that in the modern project with a large control and foreseeable ordination was not considered in neither an environmental education or the ecological consciousness in a systematic and collective way.

The debate about the shortage of natural resources, the estimates of the environmental impact, the control of the consumption of nondurable goods, and the conscious discard was not part of the education that constructed the modern society.

The Ethic Dimension and the Environment

The word ethic has origin in the Greek as *ethos* which means the study of the judgment assessment concerning human behavior. It a way of being is the way of been and behavior. It is the real character. [7]

Philosophically ethic is defined as means what is good for the person and to the society, and its study helps to establish the nature of duties in the relationship between the person and the society, so that its values are realized by the world. To live in society means to respect the moral and ethics to the peaceful living looking forward to obtaining overall harmony.

It is already known that moral values from a social group develop a normative mandatory character. So, the moral can be understood as a conjunct of the crystallized practices from the habits and conventions of a historical society. So, the ethic explains our moral behavior. According to Sanchez Vasquez "the ethic is the theory or science of the moral behavior of man in society; this means that the ethic is the science, in a specific way, of the humans' behavior". Continuing his explanation, just as the moral theoretical problems do not identify with the practical problems, even though they are much related. It is true that we cannot be confused between the moral and ethic. The ethic does not create the moral, at the same time all the morals suppose some principles, and behavior rules, but it is not the ethic that establishes it in any community. The ethics is faced with an experience historical social in the moral territory, it means that with

[6]BAUMAN, Zygmunt. *La società dell'incertezza.* Bologna: Ed.Il Mulino, 1999, p.102.
[7]HOLANDA FERREIRA, Aurélio Buarque de. *Novo dicionário da língua portuguesa*. Rio de Janeiro: Nova Fronteira, 1986.

many moral practices being used and from it the necessity to determine the essence of the moral, its origin, the objectives and subjective of the moral attitude, the basis of assessment, the nature and function of the moral judges, the criteria to justify this judgment, and the principle that command the changes and succession of different morals systems" (VASQUES, 1997)[8].

The ethic objective is to determine what is good for the person and the society. The ethic human being is to do something that benefits the other. It means do no harm the next. It is the cultural codes that obligate us to a certain way to behave, but at the same time it protects us. The ethic is an observer of the humans' behavior pointing out the positive and negative, the good and bad, the fair and unfair, and the mistakes. The ethic point out of the basic principles in which the human being's behavior must to be subordinated. It is considered to Marcus Acquaviva as a "dignity moral philosophy" [9].

Nowadays, the discussion about the ethic brings with it a concernes, about as quality of the life and the quality of our planet. Ethical possibilities are non existent if people do not understand their responsibilities for their actions and omissions. According to Francisco Albuquerque, "the ethic is translated on the search for the knowledge of how to construct what has to be" (ALBUQUERQUE)[10]. It means that the ethic is a vital element to the production of the social reality where is expected that man turns responsible for the evolution and development of the present and future generations.

According to Gabrielle Caccialanza, "In other directions the science is connected to ethics [...] In front of huge challenges is when the humanity of the third millennium faces the ethic anthropology disorder that goes with the modernity construction and actually progress. Think about these values that in each year is devastated a surface of forest equal to 150,000 Km or a half of a country as the size of Italy. A situation in which about 40 species disappear per day. It is obvious that science is mindful to establish a pact of collaboration with an ethic without less anthropocentrism and utilitarianism" (CACCIALANZA, 2005)[11].

So, the ethic would be the key to environmental preservation and conservation in many meanings and ways possible to the protection of the humans' dignity with their culture and values. It means a sustainable life in the Earth. The project of changing this way will be consolidated when we observe the ethics' concepts. For that, it will have to have an effective collaboration of the whole society which means a collective construction to redo the actual scenery as a new humanism planetary.

Ethic and aesthetic in the industrial production

The historical approach way of the XX Century shows that there is always a parallel between the vanguard artistic movements with the style and aesthetic of the art crafts thru the industrial products in a material culture space. It is able to point the Art Noveau as reference of the life style and habits of the European people from big cities during its expansion at the end of XIX Century and in the firsts decades of the XX Century when the productive ways, still in a consolidation process, looked for in the flower references of the Orient as its main aesthetic element. The life style "outsider", the colonies exploited with its forests and savannas, the movie, the photography, and the reproduction through Graphic Arts would spread the aesthetics of The New Style which finished with the past and started the modern era.

It is interesting to understand that the relation between ethic and aesthetic in the *Art Noveau* movement was not conceived in a consciousness and systematized way through the

[8]SANCHEZ VAZQUEZ, Adolfo. *Ética*. 25°ed. Rio de Janeiro: Civilização Brasileira, 1997, p.12.
[9]ACQUAVIVA, Marcus Cláudio. *Dicionário Jurídico Brasileiro*. 9°ed. Rev. Atual e ampl. São Paulo: Editora Jurídica Brasileira, 1998, p. 571-572.
[10]ALBUQUERQUE, Francisco Uchoa et al. *Introdução ao Estudo do Direito*. São Paulo: Saraiva, 1982, p.132.
[11]VALLE, Luciano (org). CACCIALANZA, Gabriele. *Ri-Abitare la Terra*: la scienza, l'etica, l'ambiente. Como/Pavia: Ibis, 2005, p. 54-55.

industrial production, but it happened through a natural and spontaneous process between the life style of the epoch and the mechanic manufacturing process in a greatly increasing phase mainly in at the European Countries that named it differently such as *Jungendstil*, *Sezession* e *Liberty*. All these are translations of this style that was the first to be applied in Arts, Interior projects and then in daily objects such as jewelry, furniture, and etc.

In a way more structured and international, it is possible to quote the Bauhaus experience as the first school to present a consistent and close relation between the shape, function, and the production of industrial goods preceded by an ethic and behavioral theory established before. According to Bürdek, "except of the writer Gerhard Marx was chosen by Gropius only abstract artists or from the Cubism painting such as Professors from Bauhaus as Wassily Kandinsky, Paul Klee, Lyonel Feininger, Oskar Schlemmer, Johannes Itten, Georg Muche, and László Moholy-Nagy. Because of the development of the industrial production in the XIX Century, the union united between project and production was separated. The fundamental idea of Gorpius was that in Bauhaus the Art and the technique should become a new and modern united unity. The technique did not need the Art, but the Art needed the technique which was the emblem phrase. If the Art and the technique would be united, the notion of social principle would have happened resulting in the consolidation of the art and the people" (BÜRDEK, 2006)[12].

The proper term "to consolidate the art in the people" show us the ethic position of the ideal professionals of Bauhaus. The project of this school (1919 to 1933) that started right after the First World War where the poor and divided Europe started its reestablishment of their process must be considered. Therefore, the style recognized as "Bauhaus" begin from a social conscience which was looking for the elimination of the superfluous decorative things that existed in the industrial products, whichever the constructive and productive manufacturing facilities. The proper Bauhaus Manifest, because of the union between artists and artisans and the common good of everybody which means Architects, Sculptors, Painters and everybody should go for the Arts and Crafts [...]. Arts and people should construct a unity. The Art can not be a pleasure for a few people, but the happiness and life of the most of the people and finally having the happy union between "Art and Technique", as the Manifest stated. It is through, that it is possible to find in the *Deutscher Werkbund* (1907) of Hermann Muthesius and in the Neo-Plasticism of Theo van Doesburg, thru the *De Stijl* (1921) movement ethics principles similar to these found in the Bauhaus school. But the Bauhaus school had the merit to better sediment and translate lessons in a didactic way the ethic concepts applied on the industrial production of the XX Century.

According to the theoretical Peter Hahn, analyzing the Bauhaus' first years (1919-1923) which were decisive years to consolidate the final model and configuration of to the school. "It is suspected that if the Bauhaus had become a world culture event, it would have happened because the school knew how to translate and really practice the ideas that already had been debated at other places in a theoretical level and even at a utopian level. In fact, during the Bauhaus' first years, many heterogeneous chains occurred happened or ideas that talked about the politics and society, the economic world, industry, Arts and Crafts, Architecture, Arts, Pedagogy, and finally Philosophy, but on the other hand going to mystic and esoteric thoughts" (HAHN, 1996)[13].

The described text above also confirms the vast big theoretical knowledge that existed as the basis to the "pure" and "sober" style of the Bauhaus school which shows its commitment to give life to an aesthetic code that goes to search for find the cause and the reasoning of the moment lived by Germany and the entire Europe. According to Hahn, "When the Bauhaus begun it meant that it was the sunrise of a lost war with politics changes or the revolution of November of 1918. Misery, hunger, disengagement, and inflation were the epoch words in which political attacks and extremism was the order of the day. At the same time, the hope of a beginning radically new increased [...]. It would be impossible to imagine that the Bauhaus' students come

[12]BÜRDEK, Bernhard. E. *Design*: Historia, Teoria e Prática do Design de Produtos. São Paulo: Blücher, 2006, p.28.
[13]HAHN, Peter in MICHELIS, Marco De; KOHLMEYER, Agnes. *Bauhaus 1919-1933*: Da Klee a Kandinsky da Gropius a Mies Van Der Rohe. Milano: Mazzotta. 1996, p.37.

from the environment of young movements of protests as the *Jugendbewegung* in which their minds would have new ideas to redo their own life such as the return of nature, the vegetarian habits, fasting, nudism, nature medicine, and the common life with *Wandervogel* [...]. Many Bauhaus' students came from the war. Because of that they were full of patriotic enthusiasm and had participated as volunteers saving lives. To ensure for the social life of the Bauhaus' students was a duty for years to the school and it was done in a way that the students used to have free food" (HAHN, 1996)[14].

So we can understand that scenery was ready to the appearance of a new aesthetic code that would go within the social and behavioral reality of a people which means that it was reciprocal to its ethics conduct and behavioral that would come. The Bauhaus' Professors and students were capable of translating the moment with perfection living through the Bauhaus' ethics principles and aesthetics a legacy to the world material culture.

On the other side of the world in the United States of America another experience deserves our attention. Differently than in the post war Europe, the U.S.A in the beginning of the XX Century had an industry in expansion and it begun its process of techno manufacturing through the world. The strong immigration which occurred for a long time made it possible for the influence of many cultures and new possibilities of styles and aesthetics from within inside that Country. The tradition of an oriented product to the market and the huge spread of the consumption made the American Design at the first decade of the XX Century to have a strong emphasis in its sales and in the obtaining of market success. In this way, the American Design used the objects' shape and style more as a sale strategy than an intrinsic content to the industrial product. In the American concepts, the Design was something that could be inserted after the production as a cosmetics final make up.

In this way, the recognized "styling" appeared in the U.S.A. which is the basis after the 20th century until the 50th of the highest glamour and recognition of the "Streamline". This movement had as basis in the aerodynamics principles that came from the efficiency of the organic shapes of fishes and birds, as well the drop of water applied to the trains, shapes, and airplanes' design which had the velocity as projectile reference. It is interesting to observe that this practice also influenced other products that were far way from the aerodynamics products such as radios, cameras, and office machines. It was a symbolism content without any functional motivation.

Therefore, the "streamline" begun as the American modern translation, as well as indicating to the world of its productive capacity through a strong line of industrial context. According to Burdek "The Designers used to see their work as a way to make the product more irresistible which means looking for interpreting the users' hidden desires and hopes and to project it on the objects in a way to stimulate the purchase. Separated from his technical solutions, the designers were employed only to solve these kinds of problems" (BÜRDEK, 2006)[15]. At this time, the designers' performance that helped to consolidate the "streamline" deserves featured who are Raymond Loewy that made the expression what is made does not sell, Henry Dreyfuss, Norman Bel Geddes, Orlo Heller, Richard Buckminster Fuller and Walter Dorwin Teague.

It is noticed that the performance of the American Designer at the beginning of the XX Century was to insert the design into the industry as a way to increase the sales and the search for the commercial success to the companies. According to Heskett, "to show the velocity and modernity as a symbol of power and did not decrease the efficacy of an object, even though did not express the function" (HESKETT, 1990)[16]. If we add the fact of the being of a huge mass of consumers that appeared through a strong medium social class we could understand that the formula was ready where the induced consumption would feed the sales and also increase the production that encouraged the consumption. The ethic behavior of the time made a "Streamline"

[14]Idem, p. 38-39.
[15]BÜRDEK, Bernhard E. *Design*: história, teoria e pratica do design de produtos. São Paulo: Blücher, 2006, p.181-182.
[16]HESKETT, Jonh. *Industrial Design*. London: Thames and Hudson. 1990, p.120.

aesthetic to appear in a consistent way with the reality lived, which resulted in means the American industrial and economic expansion.

Returning to Europe, other experience has to be highlighted that contributed a lot to the design to consolidate in that continent mainly in the academic context which was *Hochschule Fur Gestaltung - Hfg*, The Ulm School (1946-1968). Just like what happened to Bauhaus, the pioneer's professors of the Ulm School and his firsts Rectors had its origins in the 'Concret Art Movement' who are Max Bill and Tomás Maldonado. According to Giovanni Anceschi, "Maldonado worked at Universities for more than 50 years since 1954 and made part of the Academic Professors of the Ulm School, The Hochschule Fur Gestaltung heir of the Bauhaus' dialectic. In a few years he turned to be the President of the Bauhaus School and its guide intellectual. Before it all his education of culture was developed at the humus culture, ethic and civil of his hometown which is the most European one of the South American's cities, Buenos Aires" (ANCESCHI, 2001)[17].

It is well known that the Ulm School just as what happened to the Bauhaus was established after a huge war having Europe once again as the main scene. At this time it was the Second World War. In this way, it comes to Europe's light through the Ulm School some concepts such as rationalization, functionalism, economy, normalization, and neutrality. To Andrea Branzi, "the methodology proposal by Ulm to impose at that time followed away of an objective rule indisputable, which would propose a new way to a Germany and Europe looking for certainties after a lost war and so many horrors and wrong dreams. What was the main Ulm's theorem? Which approximated strategy is the proposal to a universe of his industrial objective? In fact, the school proposed a substantial cooling of its own object, a naturalization of its expressive values and signs through formal codifiers of a big purity, in which, at the same time prevents the visual and mechanic arrogance" (BRANZI, 1988)[18].

Therefore, it is noticed that rationalism proposed by the Ulm School would meet the modernity project increasing in Occident and brought forth from it as collaboration of the scientific and methodological rigor applied to the design activity. Inside of the lived scenery Ulm brought intrinsic to its projectile model the concept of benefit dissemination of industrial production to everybody and even expanded the design performance to the medical areas, to the disabled persons, the transports, the work tools, and the communication. Ulm intensified the social function of the design and inserted its fundamentals, the debate about the peripheral and underdeveloped countries. According to Bonsiepe "the test about the relevance of the Ulm's model in the peripheral countries predicts therefore the main characteristics of this model. Certainly the international composition of the Hfg Ulm's Professor and students was not casual. In fact, the program had characteristics that expended out of the intern situation of Federal Germany. It does not mean that the Ufg Ulm wanted to have an international value. It was conceived by the industrialized countries, the center or metropolis center, but it also met the Countries which the industrialization as an instrument to reduce its own technological dependency to generate wealth and wanting a modern culture standalone […]. The rationalism was opposed to the poverty and exoticism that prevented the paternalism behavior of the simple social assistance" (BONSIEPE, 1995)[19].

In this way, we can attest that the ethic and theoretical concepts of the Ulm School agreed with the aesthetic results of its production conceived into the material modern culture. The aesthetic developed, decodified and practiced in the Ulm's model even though it had been conceived in a "Center" and its reality lived was accepted and amplified as a periphery context. Ulm put in the center of the debate of the aesthetic antithesis that extols the consumption and

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[17]ANCESCHI, Giovanni in BUCCELLATI, Graziella; MANETTI, Benedetta. *Ad Honorem*: Achille Castiglioni, Gillo Dorfles, Tomás Maldonado, Ettore Sottsass, Marco Zanuso. Milano: Hoepli, 2001, p.159.

[18]BRANZI, Andrea. *Learning from Milan*: Design and the Second Modernity. Cambridge: MIT Press edition, 1988, p.41-42.

[19]BONSIEPE, Gui. *Dall'oggetto all'interfaccia*: mutazioni del design. Milano: Feltrinelli, 1995, p.130-133.

refers to the superfluous, and inserted in the context of the culture a new aesthetic that came from the rationalism and the functionality. The Ulm also claims as reference to the project the productive facility, the manufacturing technological and its methodological rigors and in the theoretical way that is closer to the reasoning and positivism.

Conclusion

It was observed during the development of this article that the ethic as a model of behavior and life style, and the aesthetic as formal decode of the meaning, and the meaning of the human's social behavior always maintained a reciprocal relationship with each other. Moreover, it completes each other in a constant state of mutation. It means man as a social actor and the industry as an agent of production of goods of mass consumption that works in scenery where the ethic behavior is used as reference to the industrial production and it is based in the human necessity to the conception of new arts and crafts.

The historical way of the relationship between ethics and aesthetics shown here and presented through 2 cases such as *Art Noveau, Bauhaus, Streamiline*, School from *Ulm, and the interesting experience of the Russian* vanguard demonstrate and prove that the close interrelation exists. In the same way, the environment and the human's socio-culture in relationships through their behavior and life style that are presented as elements to be codified as aesthetic references of the industrial production.

As complementary scenery, the discovery of new materials, as well the appearance of new productive technologies also influenced the conception and the aesthetic shape of the industrial products. Nowadays, as never ever seen before the evolution of the productive technology, as well the appearance of new raw materials offer a real revolution in the use and shape of the art crafts. Plus the socio-culture influence as a determinant fact to the formal configuration and condition of the products inside of our material culture. With this sum of factors and attribute, the objects begun nowadays of being developed not only through the functional and productive aspects, but also through the aesthetic factors, which are related to sensitivity, emotion, and feeling.

It is legitimate to say that through the appearance of new polymers such as the polymers, thermo polymers, thermoplastics, composites, light alloys, synthetic fibers, and others made it possible to decrease of the easy production process' time and the number of components of the product bringing, as consequence to the consumers new ethic messages, new aesthetics references, and new consumption experiences. Due to the capacity of new materials of today, being soft, light, transparent, translucent, and others, as consequence new products have arisen, which bring the people new values very difficult to measure before, such as emotion, the value of like, and perceived quality.

But this same technological capacity that got to know how to introduce a revolution of the habits of the XX century, one another hand did know at the same way to establish new sceneries that pointed to a environmental socio cultural able to be between the ecological and environmental ethics. The application of a linear mechanics and rationalist model to the modern world project as well the distancing of the relationship between the industrial development and the environment has, as result the water, air, and earth pollution, the ozone hole, the greenhouse effect, deforestation, desertification, and the increase of the nature phenomena or catastrophes. The environmental philosopher Luciano Valle complete like that "about the relation with nature, the modern man stepped back in comparison with big religious and philosophic traditions of the past, it was not known how to maintain the environmental knowledge that can be synthesis

through the Taoism statement which says: *that the wise man lives in harmony with the earth and the sky*" (VALLE, 2005)[20].

In the limit f the XXI Century only started, it seemed appropriated to talk about others possible relation onside of ethic and aesthetic trilogy and industrial production. The aesthetic of the new Millennium in this context would be directly attached to the environmental ethic in the way of looking for to interact with the social behavior and sustainability of the planet. The thinking and debate between the ethic, aesthetic, and consumption are already mature to have its own personality or even an own epistemological way. But, about the industrialization, environment, and consumption is evident in the same way, the importance and the place of the consumer as a protagonist and main actor to the success of the environmental sustainability of the planet. Only thru the consumers the appearance of a new aesthetic consistent with the reality lived actually will be able to be legitimated. It means that the challenge that look for the environment preservation and the life quality to the future generations. This new aesthetic would have as basis different compositions of reusable plastics, the dot and line colored of the packaging papers, and recycling objects, and even the monochromatic of the products made of a unique material en renewable

In this new aesthetic model pointing as a possible way to the XXI Century which meets the environmental sustainability of the planet would have place for imperfections of products made of new and different types of raw material produced with clean technology of low environmental impact or even semi crafts. According to Manzini, "the development of clean products can come with clean technology, but it certainly requires a new projectile capacity. It is very possible to get clean products without specialized sophisticated technology. Inside of this contest, the design paper is highlighted that can be observed as an activity that unifies the possible technique with the ecological necessary promoting new social proposal culturally appreciable" (MANZINI e VEZZOLI, 2003)[21].

When the developed products were accepted in a proactive way inside of this model, the actual consumers in the name of a sustainability and clean planet would legitimize a new possible aesthetic to the design of the third millennium, and to do its part in the trilogy of the production, environment, and consumption. But these concepts are recognized and did not makeup part of the exact values and objectives of the subjects that built the modern strength of the XX Century. So, this generation must use the industrial development gathered from the modern project and insert it in this context with the production of products eco sustainability and eco efficient having as reference the environmental ethic and aesthetic to the conception of new arts and crafts of the industrial production to a second modernity to be built during the XX Century.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Supporting Communities

Design led collaborations exploring the creative and economic potential of materials made from waste.

Jakki Dehn M.Des. RCA[1]

Abstract

This paper describes findings from the research programme; 'Creative Resource' which focuses on the sustainable development of materials and the design process. The work examines the material connections between design, culture and environmental preservation.

Interviews conducted with designers, manufacturers, retail outlets, environmental managers, the waste management industry and government organisations from Europe, USA and Asia, form the basis of case studies describing design companies and manufacturers who are testing the significance of environmental concerns as a stimulus for design innovation and commercial success.

This paper considers the idea that we cannot sustain our future without industry and technological advance. For industry to survive, we need to make sure that appropriate innovation is recognised and that the supporting communities are nurtured.

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• Introduction

I am a reader in Product and Furniture Design at Kingston University in the UK and I have a background in the design industry and education. I currently direct a research programme called 'Creative Resource', which focusses on the sustainable development of materials and the design process. It is work that I have been involved with for over 10 years, the two main outcomes currently are an international travelling exhibition and a virtual and physical sustainable materials library housing over 1,200 samples from 14 countries, many of which are made from 100% recycled waste.

This paper considers the idea that we cannot sustain our future without industry and technological advance. For industry to survive, we need to make sure that appropriate innovation is recognised and that the supporting communities are nurtured.

I would like to talk today about:

- The importance of designers' involvement with the development of materials and products made from recycled waste.

- How the design process is evolving in order to maintain markets, whilst sustaining well being and using less primary resources.

- The impact of this work upon local communities.

- The importance of education in understanding the value of materials.

Almost everything we do creates something that we throw away. The result is bulging landfill, fewer natural resources and catastrophic environmental strain that compels us to take stock of what we care about, what we value and what we discard. Up to 90% of the material that we throw away is recoverable. Someone somewhere has the imagination and the ingenuity to transform this rubbish into a resource.

"Across the board, most studies show that recycling offers more environmental benefits and lower environmental impacts than other waste management options". (Georgsen. 2005)

Since 2000 there has been support from the UK government who have invested hundreds of millions of pounds into the Waste and Resources Action Programme (WRAP), not only to reduce waste but to turn it into a valuable resource. Contrary to public perception their research now shows that recycling is environmentally and economically viable.

There has to be no greater concern for designers and producers today than the environment. But even though the implications are so far-reaching. the concept of sustainability is not well understood. Legislation about the use of materials and hazardous substances means that unless designers develop sustainable design and construction processes, the manufacturing industry will not be economically effective.

"Historically people have been wary of recycled products in that they feel that they're not as good quality". (Cooper. 2005)

The public's perception of recycled materials seems to still be more negative than positive. Some industries do not bring recycled content to the consumers' attention; others endeavour to use it as a marketing ploy.

As part of the Creative Resource research, funded by the Arts and Humanities Research Council; over the last four years, 40 interviews have been conducted with designers, manufacturers, retail outlets, environmental managers, the waste management industry and government organisations from Europe, USA and Asia. These form the basis of case studies describing design companies and manufacturers who are testing the significance of environmental concerns as a stimulus for design innovation and commercial success.

The purpose of the travelling exhibition, Creative Resource, was to highlight these case studies and to give the wider public an understanding of the potential economic and creative value of the materials that are often thrown away. The hope was to change the public perception that recycled is lesser value by showing a sophisticated range of materials and products containing recycled content, which do not necessarily make you visually aware of it. To date the exhibition has been visited by several thousand people aged 5 – 80 years old and it has also been used as a backdrop to seminars and debate with local councils and the recycling industry.

- ## Creative Resource Exhibition

This exhibition is about the value we place on materials and the design innovation that can transform our perception of waste.

It comprises of five free standing material sectors. The products on display here show that using recycled materials makes business sense. The benefits are not always immediately apparent but, for many designers and manufactures, that's the point. Their products have a direct impact on quality and consequently on waste reduction. There are about 230 material samples on display which can be touched and 110 products containing recycled content.

From looking at this chair designed by Phillipe Starck, you would not know that it is made from recycled aluminium, the material looks no different to the original. Phillipe Starck's involvement means that the form has changed significantly from the original cans, which has added substantial value to the product.

- # Importance of designers' involvement

Designers understand the importance of taking a risk and exploring both the use and content of materials and they realise the benefits of collaboration. I would like to talk about some of these case studies and describe how work with materials that would normally be thrown away has supported economic regeneration in areas depressed by the decline of traditional industries.

- ## Plastic case study: John Elson, JEDCo, UK

Fig. 1: Scaffold Plank. Recycled Polyethylene and waste fibreglass. Developed by Jedco, manufactured by Uniq Extrusions, UK The economic, environmental and practical benefits of this product over the traditional wooden plank have created new markets including the off shore oil industry.

“I think that it was probably our enthusiasm that carried it through to the latter stages, it became apparent that we could economically use recycled materials……the costings were always slightly better than using virgin plastic.” (Elson. 2004)

John Elson of Jedco, a small product design consultancy, was approached in 1997 by a group of entrepreneurs to develop a plastic scaffolding board. During close collaboration with the plastics industry to develop the right material in the right way, it became clear that the majority of the board could be produced from a mixture of recycled polyethylene reinforced with waste glass fibre. The main impetus was not environmental but economic. It would cost less to manufacture in recycled materials and could address the needs of a wider market. It can be used in sensitive interiors where the dust and debris of the traditional scaffold board are not allowed.

The resulting board introduced in 2004, has many advantages over the traditional wooden board: -

- It is 20% lighter and unaffected by wet conditions enabling more efficient transportation, faster erection and dismantling.
- No splinters, sharp edges, warping, knots or rust.
- Dust free for use in sensitive interior environments.
- A safer, non slip surface.
- Greater resistance to salt water, oil, solvents, and acids.
- Lasts three times as long.
- Lower maintenance.
- Can be colour coded and have company names for added security.
- Conforms to all European platform loading standards.
- It is 100% recyclable at the end of its life.

The manufacturing plant in Wales has reached its capacity of 240,000 boards per year. They will purchase new equipment to increase capability for a growing market, the off-shore petroleum industry. The fire retardant used in timber on oil rigs reacts with the salinity of the sea water causing rapid deterioration, requiring it to be replaced every few months. This plastic plank, totally fire retardant and unaffected by the sea, makes it a safer and longer lasting alternative.

They are considering building a new plant in Dubai as Saudi Arabia exports very little and container ships leave empty all the time. They could use this capacity to sell scaffold planks into the southern hemisphere.

Jedco employ about five people, through their innovative work (the environmental implications of this project enabled finance from the Welsh Development Agency, for a specific factory to be built in South Wales,) they have enabled susbstantial economic regeneration in an area depressed by the decline of the coal and steel industry. Having taken the risk, the product has been extremely successful and major new markets have been found.

- **Glass case study: Jim Roddis, Paul Chamberlain and Gary Nicolson + Sheffield Hallam University.**

"If I was outside academia, unless I was in a cash rich company that dealt with waste glass, I would never have been able to address this problem. The thing about academia is that used in the right way it can be a positive boost for commercial industries." (Roddis. 2004)

In 1994 Professor Jim Roddis of Sheffield Hallam University collaborated with product designers and fine artists; in answer to a call by the Department of Trade and Industry to develop commercial markets for the growing quantities of green glass collected in this country.

"When you look back on the development; the idea and potential application came in those first 2 or 3 years but it's taken the last 6,7,8 years to make it a real product. It's been a hard slog… seeing it through to reality. Getting patents, sorting out the production and that's where I think that a lot of other materials probably fail." (Chamberlain 2004)

They developed TTURA; a cast composite which is 85% recycled container and automotive glass cullet mixed with a water based resin. The material was developed with local manufacturers, Resin Build, so that the commercial benefits would have a direct impact on the economy of the region.

After years of collaboration and testing TTURA is now a commercial success and is licensed to manufacture by four companies. It is used both externally and internally for cladding, paving, flooring and corporate and domestic furniture.

This material is the result of a successful collaboration between designers working in education and local industry which has made a substantial contribution to the regeneration of in an area suffering badly from unemployment.

Professor Roddis is now developing a translucent, recycled glass brick which will hold light for a time after a power failure to guide people out of a building.

- **Textile case study: Siem Haffmans; The Netherlands.**

"It's a second hand material and here we tried to upgrade it to a fashionable top market product." (Haffmans. 2005)

Siem Haffmans is an industrial designer based in Amsterdam. After meeting people working with plastic recycling within the poor neighbourhoods of New Dehli in India, he began collaborating with Ellen Sillekaens, a design graduate, to design a bag for the European market made from recycled plastic bags.

"We made the brand Rag Bag to make it recognisable…. through this brand we also try to communicate the story behind it" (Haffmans. 2005)

Ragbags are fashionable products made from recycled plastic bags and sold in Europe. The production is handled by a women's cooperative in India who wash and clean the collected plastic bags, then press and make them into new products.

Thanks to the designers' involvement, the Rag Bag project has a direct social and economic impact on the local community creating jobs for about 50 people and giving rag pickers higher rates of pay for better quality plastic bags. This product highlights the global impact design can have on employment opportunities as well as helping to change the perception that recycled is lesser quality.

- # How the design process is evolving

  - ## Textiles case study: DesignTex + Steelcase, USA.

"We were trying not to have any compromises aesthetically in the product, we knew that there had been textiles like hemp or organic cotton… we wanted something that was sophisticated and was going to appeal across the board to all of our customers, not just the customers who were keyed into sustainability." (Derby 2006)

Larger businesses such as DesignTex, a subsidiary of Steelcase understand the importance of sustaining markets by working with the needs of their customers. Their size gives them the potential to collaborate with international experts, to become leaders in developing sustainable materials and ways to conserve virgin resources.
Their core business is supplying surface materials to commercial interiors.

They collaborated with Rohner Textil, a mill in Switzerland, looking for a way to dispose of their wool and ramie waste and Ciba Geigy, to develop non toxic dyes. McDonough Braungart Design Chemistry gave them the overview, checking material sourcing and production and developing ways to conserve petroleum, energy and water. The outcome of this early work was Climatex™ a mixture of wool and ramie whose manufacturing process reportedly leaves water cleaner after the process than before. By going on to mix wool with lenzing a type of viscose with an inherent flame retardant; they were able to produce Climatex lifeguard, a sustainable, biodegradable flame retardant fabric.

"Almost all of the panel fabrics that we create these days have recycled content". (Derby 2006)

DesignTex are now working to produce a Sustainable Textiles Standard to help the industry and the consumer evaluate and compare textiles. They understand that recycling is part of a wider view and are hoping to develop a material from the post-industrial waste plywood from Steelcase.

The Think Chair with 47% recycled content is a sophisticated mass produced product and a good example of the benefits of international collaboration.

3.2 Ceramic Case Study Gifu Prefecture, Japan

Fig. 2: Olivia Tableware 20-50% recycled ceramic clay. Manufactured by Gifu Prefectural Ceramics Research Institute, Japan By increasing the recycled content of the clay, the firing temperature could be reduced, which in turn reduces CO_2 emissions, saves energy and fuel costs.

"So everyday there are people from the northern to the southern end of Japan sending broken ceramics to our press. If it was aluminium cans or newspaper they would not send it this far. But ceramics is something people have a big attachment to; so they don't want to throw it away". (Hasegawa 2005)

In the late 16th century in Japan, unique techniques such as Shino Ware, Oribe and Kizeto were developed. This meant that ceramic pieces were fired at a high temperature and would not decompose in landfill. Today the ceramics industry is an important part of Japan's gross national product. They mass produce ceramics and have repeatedly dug, fired and disposed of the local ceramic clay.

The technology required to recycle ceramics has not been given much consideration in the UK. The Waste Resources Action Programme has viewed the market as minimal and left it alone. In Japan the view is different. The history of ceramics is built into their culture, something that they have a big attachment to. In order to sustain the industry; they have felt that it was important to introduce recycling technology.

"95% of people said that they would not mind buying recycled ceramics, as long as it was well designed and functioned well." (Hasegawa 2005)

To investigate the possibilities of reducing their environmental impact several manufacturing companies linked with a logistics company who began by talking to the end user. They discovered that people had no problem with using recycled ceramics as long as it was not from sanitary ware and was well designed.

Local industries collaborated with research institutes and scholars; working for the reduction of the environmental burden at all stages of a products lifecycle, not just the manufacturing and recycling. They wanted to shift peoples' values from material concerns to the human heart and hoped that the warm feeling of clay would help this to happen. They organised workshops where consumers could experience recycled clay at first hand, either by making musical instruments or through tea ceremonies where participants could make their own tea bowls. The project was so successful that in 1999 they started collecting waste and selling recycled ceramics.

As a result of their environmental concerns the industry discovered the following unexpected benefits of working both with designers and recycled clay:

- Ceramic products are only made from one material which makes them easier to recycle.
- Recycled tableware is as durable and heat resistant as newly produced ceramics.
- By increasing the recycled content of the clay, the firing temperature can be reduced, which in turn reduces CO_2 emissions, saves energy and fuel costs.
- The main CO_2 problem is caused by washing the dishes which the manufacturers cannot

control, but the designers have tried to make the texture of the ceramics such that it does not retain so much dirt and so uses less water to clean it.

They have now linked with an organic food producer, 'Radish Boy' who will collect ceramics for recycling when they deliver their food.It is interesting that this material driven, local and interdisciplinery collaboration has given an indication of future sustainable working methods.

- **The importance of education in understanding the value of materials**

Many of the interviewees participating in this research had links with education and felt that this was a vital part of their work. Using case studies to continue to look at different working practices, I would like to describe how designers have found ways to integrate their environmental concerns about material value within the educational process.

4.1 Glass case study: Maria Ruano, Bedrock Industries USA.

"We wanted a beautiful product that would appeal to people whether or not they cared if it was recycled". (Ruano. 2005)

I first met Maria in 1994 when she was just starting out, it was good to meet 10 years later and find out how she had developed such a successful business. She said that it took about three years, getting glass, getting it crushed, getting kilns made and then finally realising that it was going to work.

She describes herself as an activist, she was keen to produce tiles, but wanted the work to have more of a purpose; she wanted to use a waste product. In 1993 she started manufacturing 100% recycled glass tiles with a facility producing 35 / 40 tiles a day. The early business was sustained by diversifying into the gift market. For maximum efficiency the staff are all trained to do each other's jobs when necessary. Now they have the capacity to produce over 500 tiles a day.

Maria gives school children tours of her manufacturing facility and runs a 'Bottle Drive' to generate material. Bedrock pays 20 cents a pound for cleaned, label free bottles. Children have funded school trips by collecting bottles, which gives them a clear understanding of the potential value of these products that would previously have been thrown away. People on welfare can engage with this activity and make money without having to claim it. The working practices of this small company has a positive impact on the local community.

St. Christopher School, UK.

At St. Christopher School in Letchworth in the UK, each year the children are invited to design and produce garments around a particular theme entirely made from waste products. The resulting fashion show highlights innovation, making rubbish look stylish

and raises funds for charities of the childrens choice. Here the children gain direct experience of turning rubbish into an economic resource that can have a positive impact on other communities.

4.2 Plastic Case study: Richard Liddle, Cohda Design, UK.

Richard Liddle's research grew out of a concern for the amount of waste plastic packaging that he saw being thrown away and a frustration with working with conventional recycled plastic material, which was only available as flat board, when plastic can be moulded so easily into three dimensions.

In collaboration with Colin Williamson from Smile plastics, the Welding Institute in Cambridge and the Royal College of Art in London, Richard has developed a process to extrude recycled high density polyethylene (HDPE) at the point of waste collection, such as a supermarket car park. By recycling waste instantly, he hopes the process will raise awareness about the value of the material. His extrusions have the potential to take endless forms and will create a different aesthetic in furniture using recycled plastic.

His idea is that at the same time as shopping in a supermarket you can make yourself a chair from your waste. He also hopes to demonstrate the potential of this process in schools.

Fig. 3: RD4 Chair Recycled High Density Polyethylene Design by Richard Liddle of Cohda Design, UK. His Extrusions have the potential to take endless forms and create a very different aesthetic in furniture using recycled plastic.

4.3 Environmental Design, Case study: Professor Fumikazu Masuda, Open House, Japan.

"One day I was walking beside a beautiful river in Kyoto and found something just thrown away, just dumped by the river, this beautiful environment, I was upset and soon after I noticed that it was a washing machine I had designed a couple of years ago." (Masuda. 2005)

Professor Masuda says that he was so shocked by this experience that it compelled him to think more about the consequences of design. In the past traditional Japanese craftsmen knew everything about materials and he felt that it was essential for designers to go back to their understanding of materials. He spent three years developing this range of 'Sustain' stainless steel. A material which already has some recycled content, is long lasting and has a coloured surface which requires no additional application. When the steel is melted down again, the colour which is produced by an oxidised layer disappears.

A few years ago his company bought a rice field and twice a year he goes with his work force and students from Tokyo Zokei University to plant and harvest the rice which is then shared amongst them. This experience gives them an understanding of materials and the environment and how the land works so hard to sustain us.

4.4 The Banana Textiles Project, Tama Art University, Tokyo, Japan.

“Ecological design’ refers to a type of design that is developed based on traditional values and by learning from the lifestyle nurtured by our ancestors who lived in harmony with nature”. (Tama Art University. 2008. p18)

Finally I would like to describe a project at Tama Art University in Japan, that I saw earlier in the year when I was asked to participate in a public critique and seminar about the textile students work, developing product from waste banana fibre. This project describes a future way of working with waste in order to develop material and product that will in turn support communities.

Tama Art University believe that it is vital in the field of Art and Design to re-examine the relationship between people and nature, they understand that studying environmental issues must be part of the regular curriculum. Supported by the Ministry of Culture, Education, Sports, Science and Technology and the government of Haiti, the project was to consider the use of fibre from banana tree branches to design environmentally friendly products. The goal was to produce commercial products that would contribute to a more sustainable world as well as cross cultural communication through the introduction of specific design and technological information that could be used in developing countries.

The students learned at first hand from one of Japan’s living national treasures about the tradition of producing basho cloth (woven cloth made from banana branch fibre used for kimonos). This craft takes years to learn and starts with growing the actual banana tree. They also had specialist instruction on the extraction of the fibres and making paper. Their final designs exhibited earlier this year, included fabric, clothing and products which were beautiful, desirable, innovative and useful. The traditions of textile manufacturing techniques were evident but the concepts were based firmly in the 21st century.

“I feel that the number of people who really care about the environment is still very small. I was among those who didn’t care. However, I realise that one’s mind can be changed by learning and experiencing. To promote genuine environmental consciousness, we should provide people with opportunities for touching and feeling”. (Yoshimu Ohtsu. 2007. P18)

The educational environment is a good place to experiment with these ideas. Students can work with industry to test the significance of their design concepts, whilst educators can talk about cultural and material values. If designers understand their traditions and the value of craftsmanship, if they are open to interdisciplinery collaboration, innovative business can be developed from locally sourced materials that will continue to support communities.

5. Future directions for Creative Resource.

I am now updating the research project web site www.rematerialise.org This database was produced in 2001 giving free access to about 80 less resource hungry materials. We are now adding the new materials so that the architects and contractors involved in producing the temporary structures for the 2012 Olympics in London can access and use the information. I am hoping that the updated website will be live by the end of the

year.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design, local development and fair tourism

The EKIT project

François Dupont [1]

Abstract

Already quite widespread, tourism has entered an unprecedented phase of growth. Along with the intensification of tourist flows predicted by forecasts arises the issue of tourism's harmful effects upon indigenous populations. Hence the birth of "fair tourism," a practice enabling rural communities to accommodate foreigners and thus benefit from a complementary source of income. However, difficulties to adjust - affecting both the travellers and the local populations - hinder the progression of this new trend and prevent it from spreading out.

My project addresses health and intimacy issues that hamper the well-being of travellers, without shaking village habits too brutally nor imposing heavy infrastructures. It opens paves a way towards a progressive improvement of these conditions while being based on local resources and uses that each one can accept.[2]

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1. Introduction

To complete my five-year course in product design, I decided to work on a final project related to fair tourism. I thought it up as a means to contribute to a more fair and sustainable development in developing countries. This personal will stems from a reflection I have been leading since my previous project which brought me to the Andes where I worked in collaboration with an anthropology foundation, and during which I had the opportunity to discover isolated communities some of whom are turning to specialized tourism.

Following a six-month stay in South America - in Bolivia - I indeed engaged in a deep thought process which led me to question the very bases and values of the massive consumption-grounded society we live in and to question my future job as a designer. I decided to choose a project theme that would allow me to keep on taking stock of this outstanding experience. A trip during which I found the key to priceless treasures in the economically poorest country of the South-American sub-continent planted the seed that would later grow into my new project. Thus the different topics derived from my main theme and the decision to study responsible travelling i.e. fair tourism - a notion based on an economic logic fostering support to economically challenged populations - came to me almost naturally.

2. Tourism : weight and stakes

Opening up to tourism by coming up to travellers' new expectations is a way for developing countries to become integrated into the world and to find their own voice. Attracting foreigners can also be a development factor in that it promotes the assets of the territory and the good qualities of its inhabitants. However, the increasing importance of this activity is but little known and its consequences remain largely unsuspected. To engage in a project related to tourism is thus a way of contributing indirectly to these improvements, taking both its positive and negative impacts into consideration.

The tourism-related tidal wave

Tourism has obtained impressive results bearing witness to its broad scope. After an outstanding boom that lasted all throughout the second half of the 20th century, it recently entered a new phase: far from slowing down, the growth of tourism is about to make an exceptional leap. Social crises, political conflicts, economic issues, nothing seems to be able to hinder the development of this already overwhelming sector that keeps increasing year after year, sometimes even exceeding the estimated results announced by world institutions.

Some indicators enable us to better evaluate the ignored but nevertheless spectacular situation of tourism. First of all, the benefits generated by tourism exceed (or equal) those generated by oil exports, foodstuff exports or by the car industry. Moreover the rise in tourism-induced benefits is higher than the growth of world economy. Finally the number of international arrivals (i.e. the number of travellers in a foreign country) is constantly increasing. From 25 million in 1950, they upped to 800 million in 2005[1]. Over the past three years, they increased by more than 20%. But the most significant example of the incredibly dynamic progression of the tourism industry lies in the forecast for 2020. Indeed, the World Tourism Organization predicts 1,6 billion international tourists per year by 2020.

Thus, tourism will double and soar up to the rank of most important industrial branch. This news, which paves the way to many development prospects while foreshadowing worrying consequences, lets us guess that we are about to witness a true tourism-related tidal wave !

A weapon against poverty

The dynamic nature of tourism represents a new economic opportunity for developing countries who invest more and more in this sector. Travel agencies keep proposing more and more trips to such destinations in order to meet the requirements of customers more and more eager to travel to developing countries. Today, some of the weakest economies are largely dependent on tourism-induced incomes, which bear witness to a real interest in this sector. Indeed, world organizations and local players are currently going on a crusade against poverty by waving the weapon of tourism. The priorities of the UNWTO are consistent with the United Nations' Millennium Development Goals defined for 2015[2], three of which undoubtedly involve tourism :

- objective 1 : "Eradicate extreme poverty and hunger"
- objective 7 : "Ensure environmental sustainability"
- objective 8 : "Develop a global partnership for development."

The fact that tourism requires a wide array of skills directly and indirectly entails the creation of many jobs, for example in the fields of hotel trade, construction or local arts and crafts. In rural zones plagued by the exodus of the young towards urban centres, tourism can be one of the main ways to cope with the disappearance of traditional economies. Thus it is an important factor of economic and sometimes human development, that many developing countries are determined to make use of.

Harmful effects

But tourism is a two-edged weapon. Indeed, worrying drawbacks give rise to particularly harmful sociological and environmental consequences.

First, despite the fact that developing countries receive more and more visitors, developed countries still benefit more from tourism-induced profits than developed countries do. Indeed, according to the UNWTO, between 1990 and 2005 there was a close to 12 % increase in market shares for international arrivals in developing countries. Tourism incomes increased by 76% in the Last Developed Countries while other countries record a 41% average growth in tourism-induced profits. However, Francoise El Alaoui, a French expert in tourism management, stated that at least 60% of this money returned to developed countries who now have total control over this sector[3]. Western agencies impose prices on players of the host regions. Between underpaid workers of the South who work in conditions sometimes very close to notorious exploitation and operators of the North who enjoy with impunity much more than them by benefiting from the resources of the developing countries, the gap is little by little widening. Thus the first report is a very strong inequality.

On the other hand, tourism generates serious instability issues. The arrival of foreigners in the most traditional environments tends to erase essential cultural features. This is one of the

instability factors addressed in our project. Considering foreigners' growing wish to visit rural areas, native populations propose excursions which still are often unsuited or stays which have an only partially controlled impact. Beyond material difficulties, the presence of accompanied tourists and independent travellers sometimes disrupts community harmony: though Western tourists do not harbour any evil intentions, native populations can sometimes be disturbed by inappropriate behaviours they are not familiar with. When completely different (or even antagonistic) cultures meet under such conditions, the damage done to the cultural heritage and the identities - undoubtedly the greatest richness of these people - lead local populations to a critical situation. But this loss can also be brought about in many other ways : More generally speaking, both folklorisation and deeply ingrained stereotypes reinforcing prejudices and letting wrong ideas seep into the tourists' fantasized vision of faraway cultures are other common factors in which this problem is rooted. Caricatured standards are then sold throughout the world as the setting of a play in which one can see predictable and predicted scenes enthralling clueless foreigners.

Moreover, the ever-growing number of environmental disasters such as the disappearance of animal and vegetal species, the disruption of ecosystems or the increase of natural resource consumption due to the flow of tourists is also an issue. This project also takes this point into consideration.

Finally, a great paradox could be observed: the expectations of both tourists and local populations become contradictory. The former, though eager to enjoy the most authentic (preserved) aspects of their host countries, have a hard time renouncing the material comfort typical of their own smooth way of life. Trips are thus often adapted to their Westerners' needs. Under the weight of their increasing number, they thus involve the destruction of the cultural shift they were looking for. As for the latter, they try to attract tourists in order to have a new means of subsistence but they mistrust these foreigners, whom they see as a real threat invading the lanes of their villages with their alien practices that natives generally don't anticipate and can't legitimately accept.

Thus, tourism paves the way to an inequality and an instability made obvious through economic and social consequences. Far from fighting against poverty, it contribute to its increase !

An ethical concern

For a few years now, all the players of the tourism industry have started to realize that only with a preliminary questioning of its traditional operation and its organization could tourism lead to a fruitful development through poverty reduction. Thus, following the example of fair trade, the sector tries to evolve towards more balanced and fair practices. Indeed, some speeches now integrate an ethical dimension and the actual shaping of tourist activities is seen in a more respectful light. On October 1st, 1999 the General Assembly of the World Tourism Organization held in Santiago, Chile, approved the Global Code of Ethics for Tourism[4], which defines guidelines to contribute as early as today to Millennium Development Goals. Many associations also follow this trend. In France, it is the case of UNAT (National Union of Tourism Associations[5]) which created the ATES : Association for a Fair and Responsible Tourism[6].

Vis-a-vis with the crushing weight of tourism, with a new phase of growth stronger and more durable of this sector, with the expressed objective to reduce poverty thanks to its development, with the threat of a critical increase in inequality and instability which clearly limit its effectiveness

by involving already for a long time contrary effects to those required, this new orientation based on ethical concerns is the first sign of some efforts aiming at establishing a fair and more sustainable tourism activity rooted in local development specific to regional territories.

Notes :

1 : Rates given in the article « Another record year for world tourism » - 29 January 2007, Madrid, http://www.unwto.org/media/news/en/features_det.php?id=611

2 : We can find information about Millenium Development Goals (MDG) on the following website : http://www.un.org/millenniumgoals/ and on the MDG monitor website which has been launched on 1st November 2007 : http://www.mdgmonitor.org/

3 : Françoise El Alaoui is an expert in fair tourism and is a master degree holder in tourism management (Ecole Supérieure de Gestion – France - 1999). We can read her memoir « Le tourisme équitable, mémoire de recherche sur la problématique d'application concrète du concept de commerce équitable au secteur du tourisme » on her website : http://elalaoui.free.fr/

4 : Resolution A/RES/406(XIII) adopted by the 13th General Assembly of World Tourism Organization

5 : UNAT – Union Nationale des Associations de Tourisme (French National Union of Tourism Associations), http://www.unat.asso.fr

6 : ATES – Association pour un Tourisme Equitable et Solidaire (French Association for a Fair and Solidary Tourism), http://www.tourismesolidaire.org

3. Fair tourism

Under the impulse of some players, tourism has changed. Efforts to reduce negative consequences and to stimulate the positive effects of this sector have led to the development of a new economic strategy based on local development. Moreover, tourism is organized to respect an accurate value system and to meet the expectations of a new category of travellers, thus contributing to a fair and more sustainable internationalization.

Local development

Local development is also based on of sustainable development[7] principles and is focused on involvement by local players. It requires a collaboration process and the pooling of various competences and means. It makes use of specific and localised territorial resources, but regional populations use their own heritage often exploited by external powers which have more material, financial and political resources. In developing countries, local development thus restores the balance and reduces the colonial-like effect of a highly hierarchized development controlled by foreign players, that is the case of tourism such as it is currently organized.

Local development is an alternative trend against some capitalistic policies allowing only a happy few, to benefit from a country's riches. Thus, it offers lower class populations in developing countries a new source of income and also new possibilities of valorisation.

A value system

Fair tourism is driven by people gathering together to share and defend values such as exchange (between people), respect (of cultures and populations), responsibility (of travellers),

solidarity and equity. According to UNAT, fair tourism "centers travel upon human beings and encounters while taking part in a territorial development effort. The involvement of local populations in various phases of tourism-related projects, the respect of each individual, of cultures and of nature and a more equitable distribution of the resources produced are the foundations this kind of tourism is based on."

A different type of globalization

Fair tourism defenders are striving to give a real voice to economically challenged ethnic groups, excluded and left aside in the world of today, by refusing to be a part of their gradual disappearance in a society that brings down boundaries between peoples but unfortunately also harms them by disaggregating traditional native identities. Fair tourism tries to help local traditional cultural identities find their own voice on a worldwide scale. The aim of fair tourism is to avoid erasing and freezing endangered cultures so as to let them evolve. We must avoid both getting lost in the propaganda of a futurism ruling out "ancestrality" and taking refuge in a prostration for a past fixed for ever and ever.

This fair alternative tourism thus refutes as much single-cultural impoverishment as cultural inertia, and refuses both "ultra-internationalist" speeches and "anti-internationalist" ravings and rantings. It stands up for a real "alter-globalization" (an alternative for a different kind of globalization).

Fair travellers

In spite of information and accessibility issues, a new category of tourists was born and has already shown a real interest in recent proposals. Travellers who are aware of stakes or of some stakes hidden behind tourism exist, although they still represent a minority. Their interest is still quite significant: according to a survey conducted by French institute TNS-Sofrès[8], 72% of French travellers are interested in this new type of tourism. These new tourists rather define themselves as travellers[9]. That shows a desire to travel respecting a harmony they don't want to disturb (49% say that they want to travel in another way[10]). Experience is one of their most important expectations. The desire to travel differently is today expressed in a very straightforward manner. For a fair traveller, meeting traditional people and coming into direct contact with resourceless populations in developing countries is a way to fulfill their search for authenticity, that is to say for a preserved traditional way of life. A vast majority of associations familiar with the issue say they are interested in fair tourism, especially people already participating in human and social actions.

As an unprecedented boom in tourism is under way and as ethical awareness is rising in this field, travellers are growing more and more interested in the idea of an alternative to mass tourism. 93% of them declare they are ready to meet local populations so as to reach a better understanding of their culture and environment, to pay more for their trips with a view to contributing to local project funding, or to taking part in social action[11].

Some specialized agencies came to life and now propose specific offers. Tamadi[12], a Franco-Belgian association, organizes stays in rural zones in Mali and Madagascar. Their support was of great help in defining the EKIT concept.

The limits of fair tourism

Fair tourism is still limited due to the fact that numerous conditions are necessary to set up projects related to this concept. It is also strongly limited because there is no response to certain real persistent problems. The tremendous cultural gap between natives of isolated traditional communities and travellers remains one of the most significant issues. Lack of information hinders the prevention of involuntary behaviours which could confuse indigenous people and could be considered as unrespectful or even insulting. Moreover, fair tourists are sometimes confronted with the difficulty of adjusting to daily gestures and lifestyles sometimes too remote from ours, as in the case of stays organized in rural villages where health and intimacy issues have not been solved yet. Lack of compromise in certain daily uses which can neither be fully experienced by travellers nor be completely rejected, are a threat to the viability of fair tourism.

Notes :

7 : For more information about sustainable development, see Brundtland Report « Our Common Future », established in 1987 by the « World Commission on Environment and Development » and chaired by Gro Harlem Bruntland. The sustainable development definition is given at the beginning of the second chapter « Towards a sustainable development ».

8 : TNS-Sofres – French survey institute - http://www.tns-sofres.com

9 – 10 – 11 : Rates given in the survey « Les français et le tourisme solidaire » (French people and fair tourism) realized in March 2007 by TNS-Sofrès.

12 : Tamadi, http://www.tamadi.org

4. The EKIT concept

Though it does not claim to solve all fair tourism-related problems, the EKIT project provides an answer to certain frequently encountered difficulties. EKIT stems from a design approach adapted to the particular context of developing countries and contributes to a more sustainable development for traditional rural communities willing to engage in harmless and beneficial tourism-oriented activities.

Currently, organizing fair stays in rural villages comes up against basic health and intimacy issues. Very often, solutions unfortunately in contradiction with fair tourism principles impose themselves, like architectures with heavy facilities in very traditional and isolated regions. We can notably consider the example of tourists who have rooms with showers with running and heated water. That represents a great contradiction regarding traditional native ways of life who wash in the river or with much more simple means. Moreover, for travellers, living here according to their western habits strongly limits the traditional life experience they were looking for. On the other hand, tour organizers such as Tamadi try to improve health conditions in residences so that villagers can host travellers in their homes ; a practice beneficial to both families and tourists. However, solving these issues is a gradual and lengthy process far from being completed yet.

Bought (or possibly manufactured) by local village associations, EKIT is a personal hygiene kit for travellers. This solution can be used anywhere in any type of environment because it doesn't have any architectural impact and because it is composed of common objects. EKIT is a compromise between two different cultures (that of the foreign tourists and that of local populations) and between limited means (as well material as financial) and minimum health and hygiene needs. Each family can borrow and use this kit when welcoming foreign travellers in their

house. Usually, only those whose dwellings have been transformed can host tourists. However, modifications are always reduced to a sum of small installations, like for example cemented grounds in spaces used to wash oneself, and are too expensive to be made in all houses. Moreover, generally, modifications are accepted only if they are minimal, that strongly limits these architectural solutions. With EKIT, host families can change according to periods, by taking turns in borrowing the kit and all villagers can thus benefit from the repercussions of the fair tourism organized in their community. Finally, avoiding creating too brutal a rupture with their customs, these objects can also be used by villagers : when the kit is well accepted, they can indeed adapt themselves. Each tool is also conceived in agreement with local cultures.

EKIT is thus presented as a pragmatic solution, which enables tourists to test conditions close to the native daily life. Each tool induces essential gestures and is easy to use. Moreover, EKIT fosters awareness and respect of the constraints related to water consumption. In areas where water is sometimes a rare and very precious resource, no waste can be tolerated. It thus enables us to keep track of the volumes consumed and spurs us to throw used water (which often stagnates in house yards or on the streets) far off residential areas. It is then used to water plants which produce an entirely natural soap, which then replaces that imported from the cities, coming in bottles the accumulation of which represents a serious ecological threat in isolated regions. Using natural soap enables one to re-use water to also cultivate vegetable species employed in a traditional way or by the pharmaceutical industry to produce specialized remedies and medicines. EKIT offers at the same time equity of a respect of host communities, better health conditions, a reduction of certain environmental issues and the stability of customs in harmony with a natural and culturally traditional environment.

The kit is composed of a small vat to wash oneself, of a graduated bucket to draw clean water, of a container to collect used water so as to throw it elsewhere or to re-use it, of two minimum water consumption sprinklers to wet and rinse oneself and feet between which a wire can be hanged to protect oneself from glances like behind a folding screen.

All the items of the EKIT solution are manufactured with local resources and techniques and made of a natural material : wood. So, this kit is affordable for rural communities who can gradually use more and more of these small personal hygiene devices so that in the end each family can benefit from this solution.

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Preview of the EKIT kit

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Sybaris

Fast good food

Fabien Vesseron[1]

Abstract

Sybaris is new kind of fastfood whose purpose is to help people to develop a sustainable behaviour toward food.

Inspired by modern habits about the way we eat and various regional events concerning traditional food. Sybaris is the result of a design approach which combine sociologic facts, a true development's will, uttered needs and existing technical solutions.

So as to build in everyone's daily routine with as few matters as possible, design has to step in and formulate a solution by cristallising through materials, links between people and mores to set a brand new conduct.

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Introduction

Food issues take an important place in our contemporary World. They are related to all of the four components of Sustainable Development: economy (food markets, purchasing power), society (health, life style), environment (agricultural issues, wastefulness) and culture (traditions, rhythms). Regarding to food issues, the world is going wrong and this is true as well in the poorest as in the richest of the countries.
In Europe, we now know that the ongoing change in food practices is leading to problems: environmental problems, health problems, cultural and social negative changes. Design has taken part in this negative change by proposing attractive products whose effects are harmful. A special role in that matter is played by the fast foods. How can Design, who took part in creating this infatuation, reverse it now?
A solution could be in creating highly attractive places, proposing attractive services but avoiding every negative effect that exists currently in “traditional” fast food. Those places would highlight local and seasonal products through quality and pleasure among life's rituals.

Aims

Starting from this point came up the project named *Sybaris*. The name is from the world sybarite who defines someone who likes sophisticated and sensual pleasures, particularly about food.

The project *Sybaris* takes the shape of a space located in town centre, committed to tasting local recipes and/or buying natural local products in order to cook at home. Its specific designing proposes answers to five main issues of development:

Sustainable supply chains

Nowadays, we are used to eat products from all over the world and anytime of the year. We forgot seasons and don’t care about the distance the products crosses to reach the ladder. The effects of this behavior are disastrous for the environment and detrimental for the local economies. Most of the supermarkets and fast-food restaurants follow the trend by proposing the same products all over the year without regard to the environmental cost (Patrick MIGNARD, 2001[2]). While the customers seem ready to break their habits, hypermarkets and popular fast foods seems to ignore it.

How can design serve the new trend? *Sybaris* proposes to highlight a sustainable approach to supply.

Inspired from the french AMAP (a consumer order in advance a basket of chosen seasonal vegetables to the producer and take advantage of it whatever the picking is), the aim is to involve local producers in the project by signing in a charter who certifies responsible farming and sustainable supply. This way *Sybaris* ensures the consumer that the products are coming from the region, are cultivated in a responsible manner and also that the producer was properly compensated. All the specific needs of a restaurant will be provided by this actors, for the basic ones, *Sybaris* will work with suppliers like Metro cash and carry or Pomona for the grocery.

[2] Patrick MIGNARD, march 2001, in http://www.alter-france.net/article.php3?id_article=903

More than enjoying a famous regional meal made from fresh local products, the consumer will also have the possibility to buy fresh products from the first to the fifth range (natural state, ready to cook, etc.). Mostly the same products that will be used in the recipes proposed to the customers. So as the Slowfood movement promotes it.

Health considerations

People, especially 30 to 50 years old, now tend to realize how important is the relation between food and health (Credoc, 2005[3]). They ask for more transparency on what they buy (LSA n°1996, 2007, page 78[4]). In times of doubtful climate, food safety tends to be a primary consideration. The attention is special while considering children when consumer enquiry shows that it's hard for young generations to reckon fruits and vegetable as a pleasure. Last but not least, the weight problem tends to be worrying. The average percentage of obese reach about 14% of the adult population. Moreover, a report from the IOTF (International Obesity Task Force) in 2005 announced that obesity concerning children has increased from 5% to 18% in 25 years. It is mainly due to unstructured alimentary behaviors toward an overmuch offer. Inadequate food in inadequate quantity without enough sport, and with the modern plague named stress. *Sybaris* proposes to its guests, during the midday service, three different sizes of plates. By the way, he has to choose between a large plate, a medium and a small or three smalls. He may privilege the quantity or the diversity. Of course the size of the starters and dessert is related to the main course. Plate's size is calculate contingent to a certain glucidic portion that is required for an adult. The dinner service is no exception to the rule, but the difference is in the meals served. A lighter menu than in midday is put forward, as it is recommended by healthy measures.

Legacy's revival

cooking traditions are part of local identity… and one of globalization's first victims. For instance fast food is a global trend that ignores local recipes and products. Especially city dwellers are aware they're losing a part of identity by living far from the countryside which is closer to traditions (IPSOS insight, 2000[5]). Many dishes, vegetables and the way to cook them are forgotten and one of the consumer's wishes toward supermarkets is the ability to buy products of local producers (TNS-Sofres, 2007[6]). Furthermore, cooking as a "do it yourself" activity is more appreciated, various emergent television programs and their success witness it a lot. Sybaris offers two possibilities: the same menu composed by traditional recipes of a large selection of regions in every place or to focus on the very region specialties by proposing a deep immersion with very specific recipes.

The project involves the intervention of food designers and regional cooks in order to give a new aspect to traditional and local recipes using design approach on strategy. People such as Ferràn Adrià, the chemist Hervé This or the French chef Pierre Gagnaire are actually doing a whole

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[3] Credoc, 2005, N°186

Catherine Gaignier and Pascale Hebel, Health's weight in French food

[4] LSA n°1996, may 3th 2007, page 78-79

Jean-bernard Gallois, Casino challenges specialists

[5] IPSOS insight, july 17th 2000, http://www.ipsos.fr/CanalIpsos/articles/543.asp

Florence Gramond, French are very attached to their farmers

[6] TNS Sofres-Asterop for LSA, october 4th 2007, N°2014

Opinion poll: Amongst you can find in it, what would make you come again in supermarkets?

questioning of traditional cooking by adding new techniques in their meal composition. The aim is not to copy such a work, but renew the old grandmother recipes in order to make it lighter, more contemporary.

Sustainable materials

The design's role is also to combine both modernity and tradition in a real furniture design knot. By the way the graphics of the restaurant is inspired from the old massive wooden table and bench, all-sharpened, with stone-appearing cliché of the old farms. The result is a soft, rounded furniture in MDF in order to decrease the environmental cost that a noble essence would have brought on. A Zebrano veneering covers this material in order to follow esthetics of wooden veines and give a natural aspect to the pieces. Instead of stone, Corian is used for every plane work surface due to its durability and efficient molding properties. The main graphic charter is inspired from wood, with dark and light browns, a butter cream yellow and a deep blue used to replace the traditional biological green. The utensils are designed in two different kinds, the first one is permanent, and sees glasses in true glass, stacking plates for each portion, and inox cutlery covered with a poplar essence grip. The throwable one is used for the takeaway and enjoys a glass in polylactic acid, which recycle better than a classic polyethylene, plates in sugar cane and cutlery in compressed corn, all new sustainable materials which satisfies to environmental norms DINCERT-CO and EN-13432 about biodegradable tableware.

Social changes

Our ways of life are deeply changing, especially eating habits. Today we spend from fifteen minutes eating to hours, depending on the time we have and the people we are eating with. Moreover we tend to be less regular in our meals (Credoc, 2006[7]). Based in this observation *Sybaris* is adapted to our new habits, combining two atmospheres: a first one close to the very principle of fast food. Somewhere you can eat quickly, depending on your hunger and the time allowed to your lunch, something good which will keep you full of energy until the end of day, and a second one unfolding in the evening and revealing a restaurant-like place, both proposing the same products. The designing of the space has to take into consideration those actual behaviors by adapting the furniture and the space. As it is said on the very beginning, *Sybaris* will take place in the heart of every region's main cities. It is dedicated to an active and quite young part of workers in search of an healthy place to eat quickly, and to have fun in the evening. But it is easy to extend the kind of customers to seniors and families.

By combining these themes, Sybaris wants to be the first national movement encouraging a healthy regional identity devoted to a global and responsible development through a fast-food chain competing with "traditional" fast foods.

[7] Credoc, september 2006, N°196

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Credoc, september 2006, N°196

Fanette Recours and Pascale Hebel, New generations scared by regularity

Fig. 1: Sybaris' table and benches on a midday service aspect

Fig. 2: Sybaris' table and benches on a dinner service aspect

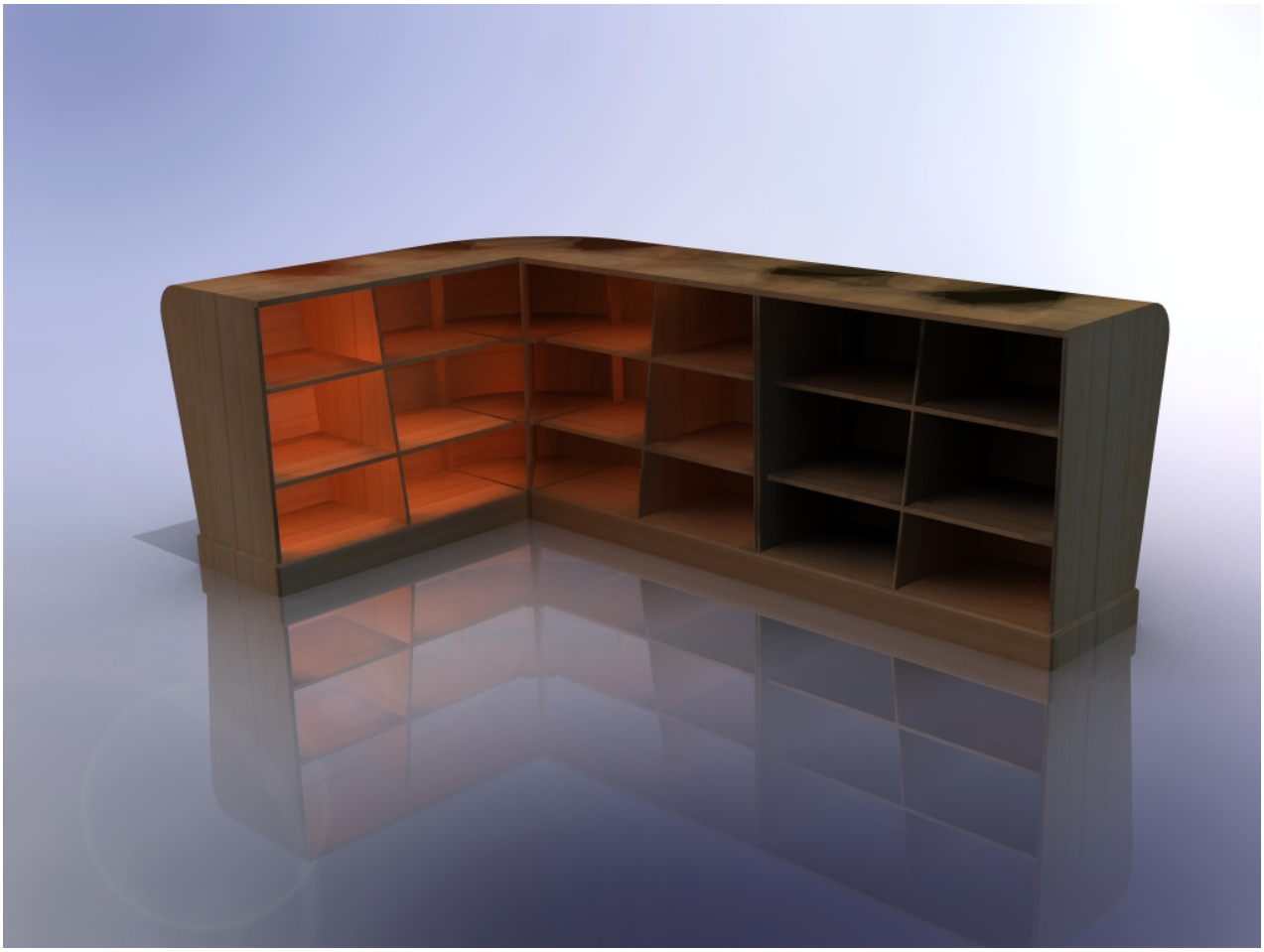

Fig. 1: Sybaris' modular counters set together

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Is design the answer to cultural acceptability of waterless toilets?

A collaborative approach to design research

Dena Fam [1]

Abstract

The adoption of waterless toilets could potentially reduce domestic water consumption in many western countries by approximately 20% (ABS, 2001) but this reduction, and the environmental gain it represents, is strongly dependant on the cultural acceptance of this technology by the end-user (and openness to the behavioural changes its operation would require). As Verbeek et al have noted, *"The environmental crisis is not only a technological problem, but a cultural problem as well" (Verbeek & Kockelkoren 1998)*, which suggests the need to redefine the role of the designer beyond the development of technical considerations and finite solutions to the facilitation of more systemic social change (Morelli 2007) where users and stakeholders are considered important collaborators in the design research and development process.

[1] Supervisors - Dr. Cynthia Mitchell, Dr. Juliet Willetts & Dr. Abby Lopes

Introduction

The traditional focus of design research has been product oriented, market driven and focused on finite technical solutions to problems. As Papanek has noted, design emerged as a profession in the early 20th century with the primary purpose of analysing, creating and developing products for mass production (Papanek 1984). So it is no surprise that one way design has responded to sustainability has been to 'commodify the environment' as seen by the proliferation of 'green products and technical solutions' on the market (Shove 2003). Consumer-oriented product design is centred around a narrow set of economic concerns and although it may be politically sensible to promote green consumption of products and services and 'green' ways of living, the question is whether consumer choice is the best way of encouraging behavioural change (Shove 2003).[2]

Behavioural change strategies are increasingly being linked to product marketing campaigns that do not require engagement which directly challenge a consumer's values about consumption. Rather 'green' behaviour is built into technology or products such as water efficient toilet cisterns, low flow shower heads and energy efficient light bulbs (Crompton 2008). The benefits of 'behaviour steering technology' is not being discounted here as a means of reducing resource consumption. As Jelsma has noted, technical devices have the potential to script and enforce the user in environmentally positive ways (Shove 2003). But the benefit of scripting behaviour through technology fails to engage users in the need for significantly reducing consumption[3] and the broader issues of sustainability required to cope with the emerging environmental crisis. Christensen has noted:

> *"…designs at the level of individual items or systems, however efficient they may be in various respects, do not add up to a sustainable whole." (Christensen 2005)*

There is evidence to suggest that any adequate approach for tackling environmental challenges, will require "engagement with the *values* that underlie the decisions we make and a sense of who we are" (Crompton 2008, p. 5), not just a reliance on technical efficiencies and green marketing strategies that bypass the need for significant behavioural change.

For significant behavioural change to occur there needs to be an alignment between *practices* of everyday living and the *values* that drive those practices[4]. Research into Self Determination Theory (SDT) conducted by Brown et al suggests the reasons why ecologically responsible behaviour is adopted is important for the behaviour to be maintained and pursued (Brown & Kasser 2005). For example, if an activity is adopted to uphold a set of *intrinsic* values, such as,

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[2] This is not to suggest that 'green consumerism' should be discounted as a way of influencing front-end purchasing decisions but rather to suggest that perhaps it is the role of the designer to look at the broader system within which these purchasing decisions are made and the net effects they may have.

[3] Ecological footprint studies show that we need a significant improvement in how we utilise resources (as much as 90% less energy and materials - a Factor of Ten) to meet human needs equitably within our planet's carrying capacity. (Schmidt-Bleek 2008)

[4] It is important to note that there may be a combination of values or contradictory values occurring at the same time, for example the desire to save water but the enjoyment of having hot showers, therefore the user may buy AAA shower heads to save water but feel less conscious about having long showers – creating a rebound effect of overall increased consumption. The rebound effect in relation to technically efficient systems has been noted by Schmidt-Bleek (Schmidt-Bleek 2008)

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personal growth, emotional intimacy or community involvement, the behaviour is more likely to be steadily adopted, as opposed to an activity pursued to uphold a set of *extrinsic* values, such as social recognition, financial success or material attainment (Brown & Kasser 2005, p. 351) This implies that introducing new technologies that require significant behaviour change, such as composting toilets, will be more readily adopted within specific social contexts where users' values dispose them to change everyday practices in the use of the technology. It is not the technology or cultural values alone which will influence behavioral change but rather a combination of the available technologies, values, existing habits as well as infrastructures that support the acceptance of a new technology (Knot & Luiten 2006).

Transitions in practice – A case study of composting toilets

The embedded habits of use associated with the water flushing toilet have been the generally accepted norm in many parts of the industrialised world for the last 100 years. This method of disposing of human waste raises serious environmental concerns not only of the amount of water used to flush and treat waste but also the amount of faecal sludge that is discharged without treatment into waterways.[5] Therefore the problems associated with water borne sanitation does not only relate to the amount of water used but also the amount of grey water contaminated by black water from the toilet. It is estimated that a person produces approximately 400-500L of urine and 50Kg of faeces per year and is flushed away with an estimated 15,000L (approx. 20% of domestic water consumption) of potable water before being combined with an additional 60,000L of grey water from the household. Therefore the relatively small amount of faeces and urine (550L/person/yr) is allowed to contaminate more than 75,000L of water per person per year (ABS 2001).

A critical factor to consider beyond the amount of water used is that considerable energy is required to remove faeces and urine from the water stream prior to disposal or reuse. Carbon and nutrients in faecel sludge are viewed by the existing paradigm as wastes and pollutants but are in fact resources that could be recovered and reused in agriculture.

Considering the expected rise in the global population[6] paired with the prediction that nearly half will face water shortages by mid century (UN-Habitat 2003) this resource intensive sanitation system seems an unsustainable option not only for industrialised nations but importantly also for developing countries where it is not affordable for the vast majority of people and does not offer an approach ensuring sustainable societal growth (Winbad & Simpson-Herbert 2004). Urban sanitary practices of industrialized countries have greatly influenced the aspirations of developing nations where the flush toilet is generally perceived as the most desirable form of sanitation. Therefore the demonstration and use of ecological sanitation in industrialized countries has the added benefit of raising the status of the technology in both contexts.

Ecological sanitation options such as 'composting toilets'[7] which function without water offers a way of potentially reusing the nutrients of human waste and are possible alternatives to the flush

[5] "In Europe, 79 major cities out of 542 are estimated to have full treatment of their sewage. For example, as late as 1998, Brussels—the political capital of the European Union—had no treatment whatsoever on 70% of its sewage prior to directing it into the waterways" (Rosenquist 2005, p. 335)

[6] There is an projected rise in the global population from 6.7billion to 9.2billion by mid century (UN-Habitat 2003)

[7] A composting toilet is a dry toilet that does not use water but rather composts the waste aerobically for up to 12 months before being sanitized, free of pathogens and safe enough to potentially be reused to fertilise soil.

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toilet. But no matter how technically sustainable these systems may be, uptake depends on the acceptance by the intended user. Although waterless solutions are technically functional there is a gap between the current availability and the cultural acceptance of the technology in many western countries[8].

The general lack of acceptance and limited diffusion of the technology can be attributed to certain technical and institutional factors which has led to the path dependency of the existing system and the technology of the 'flush toilet' (Quitzau 2007). As defined by Rip and Kemp 'path dependencies refer to the interrelatedness of artifacts with other artifacts, infrastructure and routine' (Rip & Kemp 1998, p. 354), configurations of which make extreme changes in the direction of the technology complicated, thereby limiting alternative socio-technical developments (Rip & Kemp 1998; Shove 2003).

The historical development of waste water treatment in many industrialized countries has been a result of the co-evolution of infrastructure, technology and practices over the last century (Panebianco & Pahl-Wostl 2006). Technological development evolved as a way to deal with water pollution and subsequent outbreaks of diseases such as Cholera and Typhoid. The engineering solution to the problem originally perceived the social dimension as an external factor, however the technology is only the hardware and it is becoming increasingly obvious that the human element must be an integral part of any socio-technical transition (Panebianco & Pahl-Wostl 2006). As Shove has critically noted, the social dimension is neglected in transition literature which focuses rather on the technical system and infrastructures and as a result "sustainability is tacitly defined as a matter of resource management, efficiency and ecological modernization" (Shove 2007, p. 768). This focus neglects habits and practices of everyday living which involve consumer-citizens and transitions not only in technology but importantly also in practice (Shove 2007).

Emphasising a technological transition, underestimates the social environment in which the technology is used. For example, the 'flush toilet' is not an isolated artifact but part of a socio-technical landscape. It is made up of sewerage pipes, waste water treatment plants, water supply, extensive capital infrastructure investment, rules and regulations dictating health standards on treatment and cultural habits of use which have become embedded in western society over the last century. The combination of the artifact and the socio-technical landscape has been termed by Mumford as the 'megamachine' (Mumford 1961) which in the case of water borne sanitation has created an enormous physical barrier to change. In spite of this, the design of the flush toilet disposes it to be treated as an isolated artifact, supporting the cultural disconnection in relation to water use and waste production.

Therefore if design is to influence shifts in the socio-technical landscape towards more sustainable outcomes then considering how alternative technologies such as waterless toilets are *adopted and supported* is important for the transition to occur in practice. It is interesting to note that much of the research has been focused on how novel technologies are *introduced* rather than how they have been adopted (Rip & Kemp 1998). And importantly for the diffusion of alternative technologies, there is limited understanding about strategies for supporting and harnessing innovative niches that diverge from mainstream regimes and meet human needs in environmentally sustainable ways (Smith 2003). What is known about technological development is that technological change is inherently social (Rohracher 2006) so it would be logical for designers to consider how composting toilets are culturally accepted within a specific social context.

[8] This is not to suggest that acceptance of waterless toilets is purely a cultural phenomena, there are also technical issues and building constraints that may limit the feasibility of adoption in many areas. Eg. lack of space below the bathroom floor to install the composting chamber

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The ‘Dry Flush’ project

Responding to the problem by designing the artifact alone disregards the well established practices associated with the ‘flush toilet’ and the configuration of artifacts, infrastructures and routines which have co-evolved over time to establish the existing paradigm of water borne sanitation. The adoption of alternative technologies that require a divergence from conventional practices is not just about *buying and installing* them but also about integrating them in *practice,* described by Lie and Sorenson as the *domestication process* (Lie & Sorenson 1996).

The ‘Dry Flush’ project, undergraduate research conducted by the author, was originally aimed at developing a design solution to issues of cultural acceptability of composting toilets within an urban Australian context. Rotaloo Australia,[9] a local manufacturer of composting toilet systems, was initially involved as an industry partner in the project where the aim was to redesign the hardware as a way of increasing cultural acceptability. The design of the toilet pedestal was user-centered and took into consideration the embedded habit of ‘flushing’ as a way of maintaining a sense of normality in use. A flushing mechanism was designed to flush ‘fine grade pine bark’ into the composting chamber as a way of adapting to the existing habits and contributing to dehydration of the collected waste[10].

The ‘Dry Flush’ project emphasised the importance of the *domestication process* which required a change from passive to active involvement in use and maintenance. Therefore the research project shifted from designing the finite solution of the artifact to the systemic solution of integrating the artifact into daily practice. This required a number of stakeholders being considered in the design research process. End-users, cleaners, maintenance staff, installers and the important part each of these stakeholders would play in the enduring effectivity of the design were considered.

With the understanding that technological change occurs in social contexts, there was a perceived need to locate a test-site for the technology. Therefore the Hazelbrook Steiner School was considered as a potential collaborator in the project. The Steiner School curriculum has an established philosophy of combining education and operational practices and has a strong commitment to environmental sustainability within the school community. They were open to the possibility of demonstrating the technology within the school and potentially offered a means by which the ‘social learning’ could occur in practice[11]. The aim was not only to design the artifact but to design the artifact’s entrance into everyday use. This was achieved by designing a template for a website which included information on how the toilet could be incorporated into everyday practice (See figure 1.)

[9] Environmental Equipment Australia is the manufacturer of Rotaloo composting toilets who became an industry partner of the author in developing the ‘Dry Flush’ toilet pedestal. www.rotaloo.com

[10] The addition of a certain amount of carbon based material such as woodchips is suggested to be added to the composting chamber and is commonly used as a way of balancing the carbon-nitrogen ratio and contributing to the dehydration of the pile.

[11] The author contacted the Hazelbrook Steiner school and the educational facilitator, Amanda Bonnie and discussed the dry flush toilet project and the school’s willingness to adopt composting toilets.

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Figure 1. Template for potential children's website

The potential website was designed specifically for the context of the Steiner School in a form that would engage school children in learning about:

- how the toilet worked
- what happened to the waste
- where the waste can be used
- how the toilet should be cleaned and why
- what maintenance issues are involved

Importantly the website aimed to present global test sites of ecological sanitation where users had the opportunity to learn about current projects being installed and implemented in various parts of the world, encouraging the normalisation of alternative sanitary practices.

But the domestication process is not only about the practical work through which the artifact is integrated into practice. From a socio-cultural perspective there is also a need to transform the cultural categories that give meaning to the technology – this could be viewed as the *symbolic work* required in the transition. As Horan has noted through her documentation in the social history of the 'toilet', comfort has replaced utility and expanse has replaced brevity. Over time the toilet has transformed from a chamber pot under the bed to a closet behind closed doors to the current transformation in the 21st century where the toilet is now situated in a bathroom which

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has become a site for spacious relaxation (Horan 1996). In less than two generations, many industrialized countries have come to take the convenience and comfort of the modern bathroom for granted, unaware of the inconspicuous use of water and the inconspicuous production of waste (Shove 2003). Therefore the design of the website not only served the purpose of social learning but also contributed to transforming the cultural understanding of sanitation from the conventional view as a means to dispose of waste to a means of 'closing the loop' and recycling nutrients.

Reflections

Although the importance of sustainability is becoming a commonly accepted view within our culture, what are lacking are the practices to make sustainability a reality. Design's historical tendency has been to focus on developing technical efficiencies in line with existing conventions but there is also the potential for design to facilitate new practices and routines of everyday living in line with environmental sustainability. This suggests a shift from design's finite approach of a product/system solution to sustainability to considering how the introduction of alternative technologies interacts with conventions and everyday practice.

The diffusion of the 'flush toilet' has brought with it standardized routines and practices. This has created a situation where the adoption of waterless toilets will require significant behavioural change, from passive to active involvement in use and management. The diffusion of waterless toilets must overcome many obstacles related to path dependency, which are characterized both at the systemic level and the level of daily practice. Users and stakeholders need to be included in the collaborative design process not only in relation to the development of the technology but also in developing operative strategies for adopting the technology.

This socio-technical transition requires a certain amount of 'social learning' in adoption of alternative sanitation. Therefore the potential for enabling social responsibility for managing human waste is far greater within the environment of a community with intrinsic values about the technology, such as an educational institution like the Steiner School, than being imposed on communities that do not value the technology or see the need for a change in sanitary practices.

Diffusion of Innovation theory would define the Steiner School as 'early adopters' as they are clearly a minority of the population potentially willing to adopt the technology (Rodgers 2003). The social system of the Steiner school is where the process of diffusion takes place by which the innovation is communicated among its members. The school community has common values about environmental sustainability. They have vegetable gardens educating students on principles of permaculture and recycle all their organic waste on site. The potential adoption of waterless toilets is compatible with their commonly held beliefs about sustainability; therefore there is a greater potential for an alignment of *values* and *practices*. Rogers defines compatibility as one of the four factors that effect the rate of adoption of innovation within society, (compatibility complexity, trialability and observability) (Rodgers 2003).

For much of the wider community the relative advantage of waterless toilets is difficult to perceive especially in many western countries such as Australia, where the environmental impact is inconspicuous and the convenience of the 'flush toilet' is deeply embedded in habits of use. The slow rate of adoption of technologies would categorise waterless toilets as a *preventative innovation* (Rodgers 2003) as the comparative advantage is difficult to appreciate for users. For example, the benefits of water savings and waste reduction of a waterless toilet are not obviously

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apparent as the user is disconnected from the environmental impacts of the conventional system.

The adoption of new technologies and development of practices is a social process and as Rip and Kemp noted:

> *"Individual behaviour, organizations and society have to rearrange themselves to adopt and adapt to innovation. In this sense the introduction of a new technology is an unstructured social experiment"* (Rip & Kemp 1998, p. 346).

Design's potential in creating systemic change lies in its ability to enable the *social experiment* and encourage behavioural change beyond the limitations of a market driven technical product. In the case of the 'Dry Flush' project this meant considering the specific context for the introduction and demonstration of the technology as well as how design could contribute to the social learning process.

Conclusion

> *"Technology is not an external driver of societal change"(Rip & Kemp 1998, p. 335).*

This paper has aimed to highlight that technological change occurs within specific social contexts, where technology, society and everyday practices have co-evolved to shape conventional use of a technology. Therefore if design is to contribute to sustainability beyond the realm of technical efficiency, it must take into consideration how alternative technologies are adopted and supported and this requires an understanding of the socio-technical landscape in which the artifact is being introduced. In the case of the introduction of technologies such as waterless toilets which require significant behavioural change, this will no doubt require close engagement with not only the end-user but a broad range of stakeholders in the design research process.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design tools for sustainable lifestyle:

the Italian co-housing experience

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Abstract

This paper presents a specific approach to service design based on social innovations in urban contexts. Within these social innovations the focus is on creative communities, which are "groups of innovative citizens organising themselves to solve a problem or to open new possibilities, and doing so as a positive step in the social learning process towards social and environmental sustainability"3. From the signals emitted by social innovations and from the analysis of creative communities, it is possible to reinforce these new lifestyles through service design.

Our research focused on one such creative community: Co-housing. Analysing this phenomenon raised the question of how design could help the development and organisation of these communities. The aim of this paper is to present some designing solutions to facilitate and replicate the creation of these co-housing communities whilst maintaining the quality inherent to the original innovations.

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1.Co-housing - A working definition

Co-housing, a residential community with shared services and facilities, first appeared in Denmark during the sixties and is widely found today especially in Sweden, Holland, England, the United States, Canada and Japan. It is essentially a combination of private dwellings, each with its own intimacy and autonomy, with the advantage of shared facilities such as micro-nurseries, DIY workshops, laundries, guest accommodation, vegetable gardens, gardens and so on, which offer social, environmental and economic benefits to the community.

Each settlement typically consists of 25 to 40 dwellings where families and single people decide to live together, after a long process of participatory planning. In addition to being part of the building process, the shared planning stage is necessary in designing a “neighbourhood community”: before individual physical space is planned, the communal space must be designed and “filled” with the shared facilities chosen by the community itself.

There are essentially two motivations that steer people towards this new form of neighbourhood: the desire to socialise in neighbourly relationships, while at the same time reducing the complexity, and consequently stress and fatigue, of managing everyday activities.

2.General characteristics

The architectural structure of existing residential buildings, organised into day space: kitchen-dining-living room and night space: bedrooms and bathrooms, is geared to the old family model (father and mother with two children) and is no longer able to satisfy a series of needs/requirements that have changed because families have changed. The basic structure of the nuclear family has altered over the years: the number of single people is growing, couples with children are on the decrease, children stay inside the nuclear family longer and the number of multi-nuclear families (i.e. families formed after the break-up a previous marriage) is increasing. Along with this change in family structure, there have also been changes in the activities of individuals and the way residential buildings are used and, consequently, what people require of the place where they live.

Physical space undeniably influences people’s relationships, so these will differ in a tower building from those in a linear structure, in a terrace and so on. We have seen that Co-housing projects prefer low rise units facing onto an internal driveway, to facilitate relationships between neighbours. A typical Co-housing community has an external parking area, enabling inhabitants to meet their neighbours on their way home. Space is planned so as to multiply opportunities for meeting and developing neighbourly relationships.

Activities

Activities that can take place in a Co-housing community are essentially linked to the shared spaces, or are not carried out in any particular space, but always imply a more or less close relationship between people. They are therefore convivial activities (eating, having fun, opening the Co-housing community to the wider neighbourhood) or organisational activities (useful or necessary activities, general management, working, transport) caring activities (looking after children, animals and other people through little everyday jobs and errands) and leisure activities (hobbies, sports, physical and mental well-being and looking after green areas).

The Spaces

In Co-housing there is, at an architectural level a good balance between private spaces and shared spaces. There is no predefined architectural typology, even if there is a prevalence of settlements made up of private houses, which face onto little internal pathways that give easy access to a communal building which houses all shared services.

This typology however is not always possible because it is not easy to find the land in urban contexts or near the city. This is particularly true if one takes into consideration the reality of a metropolis like Milan, where it is more common to find ex-industrial buildings and areas to reconvert into private housing. In such cases it is of fundamental importance that the professionals and the future inhabitants work together to design spaces that promote and facilitate neighbourly interaction.

Shared spaces not only favour a division of space that fosters social interaction, therefore allowing and encouraging people to carry out activities they could not normally do at home, but make it possible to put the spaces themselves to greater use so as to assign other uses to individual spaces or, even better, to reduce them in size.

In general shared spaces take up 15-20% of the total area. Studies carried out on European and American *Co-housing* relieved that shared spaces have different priorities depending on the use that will be made of them, for example a multifunctional room where the whole community can meet has greater priority than a music room, where lovers of music can meet.

In a typical Co-housing project shared spaces are a communal kitchen, a multifunctional room, a living room, a children's room, a pantry, a guest room, a laundry room, a DIY workshop, an office area, a music room, a storeroom, a shopping area, a garden and vegetable patch, a gym and a room for relaxing.

3.Co-housing.it

In its research activity on innovation in housing, the DIS (Design for Sustainability) research group of the Politecnico di Milano decided to go on an informative exploration of co-housing in the area where it has experienced the greatest growth and development, the West Coast of the United States.

The most important aspects that emerged from this reconnaissance visit are listed below:

- Co-housing is growing rapidly as a new housing requirement particularly in the greater urban and suburban areas.
- Co-housing settlements are stable and generally well managed; the participants are satisfied on a relational level as well as on an economic level thanks to the economic advantages of sharing spaces and services.
- The process that leads to the birth of co-housing settlements is voluntary (group lead), uncertain (many initiatives are started but are not concluded due to a lack of the necessary competence to manage a real estate project) and very long (6/8 years are needed to move in).

These considerations lead the Politecnico di Milano together with Innosense (an angencey for social innovation) to the decision to start research into the predisposition towards co-housing in Milan and Italy.

On November 14, 2005 a opinon poll was launched to explore two relatively unknown dimensions of our daily life and our fancy: living in the city of Milan and the predisposition to

adopting a lifestyle more focussed on sharing. The initiative was sustained by Confcooperative - Federabitazione, ANCE and IKEA and over 20 associations (cultural, professional and of interest).

From the 16th November to 8th December more than 3,600 Milanese replied to a series of questions on feelings, experiences and proposal of those who live in Milan. The wide scale research (30,000 email addresses from over 20 partner associations) produced 2,800 displays of interest in co-housing from the 3,600 questionnaires completed and returned in 15 days. The socio-cultural profiling questions, created by GPF associates, allowed us to position the co-housing market in the “modernita sociale” quadrant and to size it, through successive extrapolation, to at least 20,000 families in Milan and 250,000 in Italy. The demand for co-housing mostly came from the metropolitan and urban environment (where the concept of neighbourhood has been lost), from young, double-income couples with a high level of education and from younger strata of the aging population (willing to completely rethink their life in far away places but of high environmental quality).

The profile of the interviewees was crucial to understanding how living in a city like Milan has come to be seen less as an opportunity and more as a synonym of isolation and organizational difficulty for families. 19.2% of the interviewees were between the ages of 25 and 29, 20% between 30 and 34, 15.5% between 35 and 39 and 11.9% between 40 and 44. In this age range more that 70% live in rented housing, for many not out of choice but because of the increasing costs of the housing market. The results of the study (elaborated by GPF associates) have demonstrated that:

- A quarter of Milanese suffer from social solitude and at least 20,000 families are willing to consider co-residence (Co-housing)

- Milan is a city of opportunity, it is much loved and its citizens do not wish to leave it: 43% of the sample is happy to live in this city and 80% is substantially satisfied with their home (even of it’s rented). They identify strongly with their homes, but for 60% of the sample home is an open place not a shelter.

- Of the 3,600 Milanese that replied to the questionnaire 90% denounced the loss of the community and of neighbourly relationships and therefore aspire to a life where strong social values (friendship, reciprocity, sharing…) permeate.

- 40% of the sample has never met their next-door neighbours, but 75% would like to offer help and receive help from their neighbourhood. Almost 50% of respondents would like to live in a real neighbourhood, with a baker, a butcher, a main square and history or at least in an area full of people and events.

- 2,800 families and people declared that they where interested in co-housing. At the top of their co-residence “wish list” were all those services that help one feel better and that help to guarantee a balanced life: a swimming pool, a greenhouse\ vegetable garden, a communal library and a micro nursery school.

In January 2006 two meetings were organised to present the results of this opinion poll on the topic of shared housing to the citizens of Milan and to celebrate the birth of this project with the first “co-housing party”, a shared and participated way to celebrate that was in line with the values that form the basis of the project.

The considerable and reassuring results of this motivational and market study lead to the development of the idea that gave birth to Co-housing Ventures and Co-housing.it. With the creation of a specialized division (Co-housing Ventures), Innosense decided –in the first quarter of 2006- to promote co-housing in Italy by experimenting a unique business model based on the offer of highly specialized professional services and value added that would favour a meeting between a well organized demand (in a national community) and an offer focussed on developing and designing a co-housing project.

The collaboration between the Politecnico di Milano and Co-housing Ventures managed to find a solution to the three great problems inherent in this type of project.

The first, concerning the formation of interest groups around a Co-housing project, was solved thanks to the creation of the community co-housing.it. The idea behind the project is that the internet will be the best tool for finding the critical mass of people interested in each project.

Co-housing.it aims to be:

- a centre for collecting co-housing related information and experience through its website, newsletter and study journeys throughout the world;
- an aggregation tool that facilitates the creation of groups of people interested in co-residence and their meeting with the estate developers able to build such villages;
- a display window for the various proposals and opportunities for creating co-residential villages;
- a point of reference for the creation of professional networks (architects, urban planners, social facilitators…) able to contribute to the creation of new communities.

The second issue concerns the identification of suitable areas for creating co-housing communities in areas that are promising from a city planning angle, undergoing significant transformation and regeneration, well-served and linked to the main city.

Co-housing Ventures, part of Innosense Partnership, offers professional assistance to members of co-housing.it who have already formed a co-residence group of at least 10 families living or wishing to live in the same area. Services offered (at the best market conditions) include:

- finding a suitable area,
- compatibility checks on an area or building for restoration,
- looking for other project participants,
- community development support,
- preliminary and executive participatory planning,
- legal assistance in setting up the co-operative venture,
- fixing terms with builders,
- presenting plans to Local Councils.

The third and final problem area concerns the process of residential community development, i.e. organising demand. This is the most important task of the Foundation and in practice a question of managing an assisted, facilitated process lasting 6-9 months, by which a group of people and families builds up their own co-housing vision and project (how to live in co-housing, what to share, how to manage shared services and so on).

4. How does design relate to this?

Let’s stop for a moment and reflect on a classic definition of design: Peter Behrens for example defines design as a discipline that puts in place a “rearranging of the visible” and controls a process which takes into consideration aesthetic, usage and functional values to favour a wider exploitation of the product. Although this definition may be bound to a specific historical

period it contains the fundamental concept of design - **reproducibility**, **shape**, **performance** and **diffusion** - which are still valid today.

There is another aspect that accompanies the design project that is included in this definition: when the designer thinks of a new object he thinks about a family of objects and these represent a set of actions which outline a concept of day-to-day life, this concept then suggests a lifestyle.

And this is the point; the designer's horizon is not only the object itself but the lifestyle project that it represents.

Let's now turn to the aim of our research; the designing of services for a co-housing community and relate what we do to the definition set out above.

Surely, our object is to make it possible to **reproduce** an experience (co-housing), which currently happens spontaneously and occasionally. To try to put together the instruments which will allow us to spread and reinterpret the models that emerge, and the consequent living concept. Our work aims to design new services or reinterpret existing ones, in other words **to shape** that which initially was only an intuition. Our activity tries to capture innovation and the possibilities inherent in reality, to develop and optimise their **performance** in their sphere of usage. It is nothing more than what was traditionally done by a designer: performance and shape. Finally it can be said that the social development at the base of the project, which leads to a collective sharing of the results, contributes to the **diffusion** of a lifestyle.

Design has always worked on lifestyles, on anticipating and picturing new lifestyle and it still does this today but the horizons within which it moves have become wider and also embrace the design of relational systems.

This does not mean that there is no novelty; on the contrary, this correspondence shows us that one fundamental thing has changed: the reality that surrounds us. The design of systems finds its reason for being in the shift of society from products to services.

5. Designing co-housing: the group

The shared plan, outcome of twenty or so meetings, on-site inspections and actual co-designing workshops, covers all the characteristics and requirements of a residential co-housing village:

- the layout of dwellings and spaces (with a special eye to green areas and shared facilities),
- service and property management modes,
- the standard of building and quality of materials,
- ecological building and sustainability aspects,
- overall set up and management costs.

Only on completion of the preliminary shared plans do the families and individuals sharing the project jointly commit themselves financially to realising the building project. This will be completed over the following couple of years, either directly or in partnership with the property developer who offered the area and will oversee the building work.

To undertake this task the Fondazione Co-housing Italia (Italian co-housing foundation) uses specialised social facilitators, service designers, and specialist consultants in engineering management, finance and property rights. The Foundation calls on professional collaboration

from Co-housing Ventures for the initial architectural planning of shared spaces and for project management.

The first all-Italian adventure in Co-housing is called “Urban Village Bovisa 01”: just a few steps from the Politecnico di Milano, in an ex factory, a community of around 30 dwellings is being developed with 700 sm. of shared space to plan.

The residential community building process started on 17th June 2006, bringing together all the families and people interested in the project. A large space in the heart of the Bovisa neighbourhood, the Scighera, was chosen as the meeting place for participatory planning: a place for socialising, relationship building and cultural production. Here, the would be co-housers initially got together and began reflecting on the cultural aspects of living together.

The participatory process is co-ordinated by a project manager and run by social facilitators who show participants how to reach a consensus in decision making. Its main purpose is to involve those interested in building a shared vision of the community, and help create a group identity based on shared values. Process participants initially came together around a discussion table, using interaction techniques such as brainstorming and workshop sessions.

At the warm-up stage a representative group method was used as it is useful in building shared community values.

A two day workshop was planned for the following meeting, with the aim of reaching a shared idea of the future living scenario. During the workshop the co-housers identified the activities they wish to share and how these could be located in the communal spaces in Bovisa, giving some idea of how the community wants to use this space. During this phase, participants used one of the tools created by the group of service designers to facilitate the users’ choice of activities: activity cards. These consist of a pack of 65 cards, divided into 4 macro areas (conviviality, take care, organisation, time for…) and 15 categories (let’s eat, leisure, open the co-housing to the external, courses and culture, children, animals, building neighbourliness, useful and necessary, management, work, mobility, hobbies, sport, well-being, green space), where the poetic nature of the communication appears. The graphics of these “playing cards” were thought up to highlight people’s actions and gestures: by only lightly sketching places we wanted to take actions out of their physical context, giving them greater importance and enabling people to sketch the physical location in their own minds. It was interesting to observe how the “activity cards” spurred all the community members to discuss and express concrete preferences.

Fig. 1: the use of the activity cards

The final meeting of the first stage was a technical meeting where the architectural planners were invited to answer queries.

The group building process is basically divided into two stages: the “visioning” stage that we have just been talking about, and the planning stage, which is yet to come. The first part of the facilitation project has in fact just finished: families have financially committed themselves and have enrolled in the co-designing stage. This includes site planning, shared service and facility design and the planning of private spaces, and consequently the definitive building offer and the contract of co-operative association.

Teamwork was fundamental for a good start to “Urban Village Bovisa 01”. The role of the designer was also fundamental in the approach to this new project, not only for the design of some instruments or tools but also in setting out the guidelines and overseeing the whole process. Both the process and the instruments were tested out by the designers within working groups during a series of preliminary meeting held at the Politecnico di Milano. In these meetings the effectiveness of all the tools (from the classic “post its” to the more original “activit cards”) that would be used as well as the linearity of the process were assessed so as to decide on the methodology to administer them with the end-users.

For example, we initially intended to leave a pack of “activity cards” with each nuclear family so that the co-housers would have time to weigh up all 65 possible activities. This possibility was then discarded because we realised it was important to get people talking about the idea of sharing, to express concrete preferences and discuss them together in order to reach a shared decision.

The “activity cards”, like the other working and visualisation tools, are part of a “toolkit” created by designers to facilitate dialogue between users, and between users and professional planners. It is a set of organisational support tools that leave people free to express themselves, along with the task of planning part of project together.

Since we do not study subjects/ materials but problems and problems can range through the confines of any subject\subject or discipline, to design a “toolkit” for co-housing we looked into the techniques and tools, which are normally used in shared planning processes, with the intuition that a kit could help to make the first Co-housing training experience easier.

The activity cards help the group to focus on the common objectives but are above all tools that will help us during the planning stage to visualise the first shared scenarios.

6. The design of co-housing: designing services

Our experience in the design of services for co-housing communities was based on a simple and straightforward methodology, which basically aimed at bringing out experimental ideas from either the explicit requirements or the unexpressed needs of the cohousers.

Which requirements were brought to our attention? Here are some examples from the Bovina experience:

- We would like to save some money by setting up a system of shared shopping of goods and tools for the maintenance of our houses, bikes and scooters.
- We don’t want to hire a porter; instead we would like to put in place a virtual “smart porter” as a reference point to communicate and exchange information amongst us. We would also like to organize common dinners.
- We’d like it to be a place where we can meet to celebrate birthdays, to spend an evening together, to watch films; we’d like it to be a place to invite and meet friends and relatives, where children can play; where we can share our skills and knowledge, exchange readings and musical tastes. We want our living room to be multifunctional and large enough to cook, have meals together, celebrate, meet up, watch films and have a chat in freedom.

Taking this as a staring point we now “read” the requirements that came out - some evident and many others less so or even hidden. We especially focus on the actions which are implicit in the needs (e.g. eating, caring): we look into their complexity to outline possible solutions to the problems which could arise.

We divided the co-housing services into three distinct types, each corresponding to a different design level, and we used them as our main investigation tool. The three types are:

Community services: these are services, which come about in a communal space in which they find their main reason of being. They primarily satisfy the need to be together and on a secondary level the need to make daily actions efficient.

System services: these are all the services that organise resources, human and material, according to a specific objective. They presuppose a shared desire to optimize time and running costs. Unlike what happens with the community services, the management aspect is contemplated in the design stage. Some examples would be a doorman and shared babysitting.

Instrumental services: these contemplate shared choices and duties but do not require any specific rational involvement (laundry room, tools, car sharing).

In general, the two plans that emerge are: the putting in act of the service idea within a space (architectural design) and the formalisation of a service within a process (organisation and management).

This division is used to cross at different levels (the typologies of service) various problematic areas (in other words, the design questions) picturing the scenarios in which the final choices will operate. Lets look at this in more detail with an example:

EATING (I do not have time to do the shopping, I eat badly because I rush my cooking, I eat alone, I'd like to have a vegetable garden but I can't afford it)	Community Services (space and management)	System Services (managment)	Instrumental Services (maintanence and control)
BUYING FOOD 	☐ Communal pantry, in other words there will be a supply of basic products to be shared	☐ Group buying or local exchange community	☐ Electrical appliances such a freezers, cellar for wine and cold cuts, storerooms etc.
PREPARING FOOD 	☐ Communal kitchen	☐ Having a shared cook, taking turns cooking, cooking lessons	☐ A brick oven, a slicer, a grill, a big oven, a kitchen robot, domestic mills etc.
EATING FOOD 	☐ Communal dinning room		
PRODUCING FOOD 	☐ Vegetable garden	☐ Buying directly from the producer with involvement in the cultivation	

As can be seen from the table, a primary action (eating) can be divided into different activities, which, once crossed with the typologies of services that we have identified, produce different scenarios.

Lets consider a request made by the co-housers: “We would like to save some money by setting up a system of shared shopping of goods”. This could mean getting organized communally to buy food (thus saving time and money) but it could also mean having a communal pantry from which to draw on daily (thus reducing waste and time spent on buying supplies). To these two different actions correspond two different solutions: in the first case it is necessary to provide a common space for the conservation of food; in the second case this is not necessary; in both cases it is necessary to plan the management of the process.

Another request: “We want our living room to be multifunctional and large enough to cook, have meals together, celebrate, meet up, watch films and have a chat”. This request opens up several scenarios, quite different one from the other: from the idea to have a common kitchen to use periodically and where turns are taken in cooking for everyone to having common dinning room where everyone can eat together what they have prepared individually, to having a cook at the communities disposal who could also be a member of the community.

These possibilities of sharing open up to different design solutions depending on the degree and frequency of the sharing: for example it might be decided that there will be very minimal individual kitchens and aim at making the common kitchen a place where it is possible to prepare more complex meals thus keeping in line with the co-housing ideal which is that of optimizing resources both human and material. The role of the designer is crucial here because he is able to interpret the requests experimenting unique solutions to the use of daily space.

Once identified and chosen the principal scenarios are **simulated** mostly to bring out any differing views among the co-housers and to anticipate possible problems or changes of opinions in the light of experience.

In Bovisa the simulation was a fun and important moment where participants “enacted” the daily actions imagining they where in the spaces set out for them. The co-housers divided into four groups and simulated the use of the laundry room, kitchen, garden and living room. In 20 minutes each group wrote a script and acted it out. The representation brought out many themes connected to the specific space and to the desires of each member, from these discussions it was possible to obtain design indications and points of view that had never come up before.

This experiment lead to considerable in-depth examination of the scenarios and their complexity; from this a detailed design began to take shape.

The simulation, carried out as an experiment for the moment, represents for us an interesting perspective to elaborate on for the design of services that involve a community.

Fig. 2: the simulation - project “Urban Village Bovisa 01”

7. Conclusions

If the transformation of the prevailing living model, which took place at the beginning of the century, was the result of technical-scientific research which then became common heritage, here on the contrary it is social innovation that poses challenges that must still be met.

The contents of co-housing still do not have a corresponding form, which is equally innovative and capable of receiving it: social innovation has not been taken into technical and scientific thought, which is only now beginning to question the problem.

The co-housing experimented until now do not have their own formal nature but are a more ore less creative collage of housing types already experimented and of tools thought for traditional living. This could be a fertile ground for experimenting aimed at developing new housing models

What would be interesting would be to manage to pick up all the suggestions from co-housing and ideas for a general transformation of housing, in other words interpreting co-housing, notwithstanding the specific choice of living together, as a “symptom” of a common feeling in formation, like the nucleus of a significant change in the way we live and consume. Who wouldn’t want, for example in their own building, a common tool shed or a virtual “smart porter” capable of using the information and skills of all the tenants, and maybe even managed online?

For these reasons co-housing represents for us a laboratory to fine-tune shapes and processes, which to different extents may matter in our everyday to come.

Fig. 3: suggestions from co-housing

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Creative Places for Collaborative Cities

Proposal for the "Progetto Habitat e Cultura" in Milan

Teresa Franqueira[1]

Abstract

This paper presents a proposal for a pilot project in an old milk factory in Milan, which is part of an ongoing PhD research that aims to develop a solution to enhance the growth and development of creative places for a new urban everyday life. Places where groups of people collaboratively promote and manage a mix of creative initiatives in the fields of art and culture, economy and production, social services and urban regeneration.

This places help to shape a different city. A Collaborative City, that is, a city with kernels of creativity, where people interact and enact creating a symbiosis of activities that promote sustainable lifestyles, an active citizenship, social inclusion, cultural diversity and new economic models.

It is a city where hierarchies are transversal instead of vertical, i.e, where local authorities (urban leaders) create opportunities for mass participation, bottom-up creativity and collaborative services.

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1. Introduction

The great demographic concentration in cities and the fast paced rythmn of technological change, together with the phenomenon of globalisation, have converted the city into a big crossroad of cultures, but where ever-increasing individualism is dominant. Interestingly, in the same way globalisation has prompted the rebirth of the “local”, rugged individualism has revitalized the idea of (or the need for) community.

From previous European researches (EMUDE, in particular) surfaced that a dynamic new form of community emerging is emerging, which is based on a diffused creativity put co-operatively into action by “non-specialised” people, representing a significant expression of contemporary society. The EMUDE research has defined these enterprising people as creative communities. That is: groups of innovative citizens organising themselves to solve a problem or to open new possibilities, and doing so as a positive step in the social learning process towards social and environmental sustainability (EMUDE, 2006; Meroni, 2007).

These communities are an alternative to the system, generating outputs alternative to it. They are born from the inertia and lack of flexibility of governmental bodies and the failure of nation states and their welfare systems to address the very complex problems modern society is faced with. They are groups of people who create places where they can, in groups and colaboratively, develop various activities. They produce culture, alternative economies, environmental and social sustainability, socialisation and collaborative services.

What social entrepreneurs and creative communities have in common is that they are ordinary people that invent new ways of overcoming everyday problems and of participating in public and social life in an active way.

This activity, not so common in a society mostly characterized by passivity, derives from the will to promote change and not to sit back and wait for the traditional institutions to solve all everyday problems. And they are put in practice by creative people that persist and invest in their own ideas and are able to convert them into innovative services, responding to everyday needs. These ideas are social innovations, that is, new ideas that work to meet pressing unmet needs and improve peoples’ lives (Young Foundation, 2007).

These places and these groups of people can be found worldwide, and even though they are not mainstream they can operate major shifts and changes to society. As Mark Penn refers, it takes only 1 percent of people making a dedicated choice – contrary to the mainstream’s choice – to create a movement that can change the world (Penn, 2007).

2. Collaborative City

Between 2007 and 2008, for the first time in history, more than half of human population, 3.3 billion people, will be living in urban areas. By 2030, this is expected to swell to almost 5 billion. The future of cities in developing countries all depend very much on decisions made now in preparation for this growth (Martine, 2007).The impact of globalization on city growth patterns marks a critical difference between past and present transitions (Cohen, 2006).

CEOs for Cities[2] has defined the areas in most urgent need of fresh thinking in cities as: 1. The Talented City (Developing, maximizing, attracting and retaining talent); 2. The Innovative City (Fostering innovation and entrepreneurship); 3. The Connected City (Fostering connections that link people with ideas to talent, capital and markets; cities to regions; and regions to the global economy); and 4. The Distinctive City (Capitalizing on local differences to build local economic opportunity). According to CEO, cities performing well on these dimensions are destined for success. These dimensions make cities more competitives, but these strategies have a strong economical dimension.

What in the past was a competition between countries nowadays is a competition between cities. As countries before them have battled for technological supremacy, cities now strive to implement strategic plans that will grant them a place as financial and cultural powerhouses in the globalised world.

Cities are the main beneficiaries of globalization and the progressive integration of the world's economies.They incubate new businesses, connect people, ideas, money and markets and house most universities. In our increasingly diverse society they are the crucibles for connecting cultures and generating opportunity. People follow jobs, which follow investment and economic activities.

Today's cities must speak to a world well beyond national government. They have been benchmarked against each other in terms of liveability and wellbeing, economic and cultural offer and according to the functional importance they have in various global networks (Young Foundation, 2008). They need to attract investment, inward-investing companies, property developers, the talented the world over. To survive well, cities must play on various stages – from the immediately local, through the regional and national, to the widest global platform. (Landry 2006)

And this competition is continously reinventing the way cities position and envision themselves. London had a plan to become a creative city, now it has commissioned a study on how to become a collaborative city. Toronto and Brisbane, amongst others, also follow in the creative trail, whilst Berlin has in its local agenda 21 strategies to foster not only creativity, but to become a sustainable, social and participatory city.

There are many self-nominated "Creative cities" (Landry, 2000 and 2008) either because they have a huge concentration of creative professionals (Florida, 2004), or because they have a strong role as "art cities". In recent years creativity has been introduced in economic and urban policies as a key resource to compete in the global knowledge economy. Many creative city strategies have focused on providing the spaces - physical and social environments – to stimulate the production of creative contents and communities, the start up of value added economic activities and the regeneration of degraded urban areas [Creative London, 2005]. On closer examination most of these city strategies have been actually concerned with strengthening the arts and cultural fabric and/or fostering the creative industries (Landry, 2005) which have the

[2] CEOs for Cities is a bipartisan, nonprofit alliance of US mayors, corporate executives, university presidents and nonprofit leaders, that works with local and national policy-makers to advance the economic competitiveness of cities.

potential for wealth and job creation through the generation and exploitation of intellectual property (advertising, architecture, art, crafts, design, designer fashion, television, radio, film and video, interactive leisure software, music, the performing arts, publishing and software creation).

But, a creative city, regarding its social and sustainable dimension is, in our working assumption, more of a Collaborative City, that is, a city with kernels of creativity, which are constituted by: social services, artistic and economic activities. This collaborative city is a place where people interact and enact creating a symbiosis of activities that promote sustainable lifestyles, an active citizenship, social inclusion, cultural diversity and new economic models. It is a city where hierarchies are transversal instead of vertical, i.e, where local authorities (urban leaders) create opportunities for mass participation, bottom-up creativity and collaborative services. It is a creative, connected and collaborative city.

A collaborative city is open, as opposed to the structure of other urban government tipologies, usually closed. What we can observe in very many urban strategies is this shift from systems enclosed in themselves to open systems and a growing political will to envolve citizens in the decision making process, to invest more in culture and intelecual capital.

For traditional institutions and organisations this means working differently, in collaboration with people who are not usual partners. It also means that informal networks between organisations, based on personal peer- to- peer contacts rather than formal arrangements, will become increasingly important (Young Foundation, 2008). To do this they need to develop an adaptive capacity that enables them to change the way they do things.

3. Creative Places

In tandem with the creative city's debate, there is a discussion about old ex-industrial areas and their potential for sustainable urban development. Europe has a rich legacy of industrial archeology, due to its heavily industrialised past followed by the relocation of heavy industries to other parts of the world. It now has to find new uses and solutions to these empty and abandoned places.

The passage from a period of industrial prosperity to a post-industrial one disfigured entire urban areas. It left behind not only abandoned industrial sites, but made many of the inhabitants jobless and transformed previously booming neighbourhoods in rundown ones. But this reality also opened unforeseen perspectives, as some of these abandoned places were re-occupied, converted to new uses and gradually began a new life.

The "available" architectures of these buildings were able to adapt to the most unlikely projects, and welcomed change. Open-ended in their essence and with no predetermined role they welcomed new experiences and were open to various re-interpretations. Together, the mindsets, skills and values embodied in these re-interpretations help make places out of simple spaces.

These renewed and converted places upgrade the urban environment of entire neighbourhoods. They encourage people to get involved in civic initiatives and to get together to back common causes, they provide emotional and intellectual outlets in creation, and in doing so they help people to form a better relationship with their environment and their lives. They promote social cohesion and inclusion and become active agents of a participatory democracy.

They form the backbone of what we consider, for the purposes of this research, creative places. Creative places are a new type of urban spaces where groups of people collaboratively promote and manage a mix of creative initiatives in the fields of art and culture, economy and production, social services and urban regeneration.

Creative places are the hotbed of innovative societies, in the sense they promote the exchange of existing ideas and visions and their recombination in innovative mixes (Leadbeater, 2006).

In the framework of this debate, the ongoing research intends to explore Creative Places' economic, cultural and social role within contemporary cities, investigating how they actually manage to reconcile economic and cultural development with the regeneration of citizenship and identity. More particularly, to explore the potential of Creative Places in order to propose a strategic plan and design tools that support urban regeneration processes and allow Creative Places to integrate their physical, social, cultural and environmental dimensions.

In this respect, our hypothesis of work are the following:

- Creative Places are expressions of emerging urban culture, identity and citizenship and, at the same time, they are social laboratories where these urban culture, identity and citizenship are actively and continuously produced and reproduced.
- Creative places enrich city life, promote an active citizenship, improve cultural diversity, and generate a system of relationships with the neighbourhood and the city.
- Creative Places are experiments for a sustainable city: places where creative communities can conceive and develop sustainable ways of living and producing, re-assigning new meanings to physical spaces anticipating some aspects of what could be a sustainable society.
- The re-use of abandoned spaces helps in sustainable urban regeneration and reinforces the sense of identity and belonging.
- One of the strategies for sustainable urban regeneration may be based on a facilitation process that transforms abandoned spaces in creative places.

To clarify what these places are, how they work, and what they produce, two case studies are presented, UfaFabrik in Berlin and Grote Pyr in The Hague. The data and its interpretation are the result of extensive desk and field research.

4. Case Studies

UfaFabrik. The UfaFabrik is a one-of-a-kind European experiment in community. What began in the 70's as a "squat" of the old Berlin Universal Studios led to the transformation of the buildings and extensive grounds into a local artistic, social service and ecological centre. Many lower income families living nearby were initially skeptical of the artists' intentions. But over time, this redevelopment process used the arts to engage, include and ultimately revitalise the entire community.

In 1979, West Berlin was one of the priciest cities in Europe and affordable housing was not readly available. Consequently, some individuals, resorted to squatting – the practice of occupying and living in abandoned buildings. One building taken over in this way was the former Universal Studios film studio in Berlin. The studio, famous for many productions throughout the 30's and 40's, was abandoned after the Second World War. In 1979 a group of young artists moved into the dilapidated facility, shortly before the planned demolition of the buildings. This action was referred to as the "Big Post Robbery" as Universal Studios had sold the buildings to the local post office.

The grounds of the former UFA Film studios in Tempelhof are „peacefully re-activated" on the 9th of June. A large banner was placed at the entrance reading "Welcome" to invite all of those interested to take part and to interpret the plans of the activists for themselves: a place, where the wide range of social spheres can be brought together in a co-operative project.

45 people decided to live together in a residential community, shared their income and took the chance to build their own sustainable village in the metropolis Berlin. New ideas have been implemented at the ufaFabrik over the past 25 years, involving ecology and sustainable development, the testing of concepts for producing culture and approaches to social development and neighbourhood work.

Today the activities of the 30 residents and over 200 co-workers continues to be informed by the vision of shaping a meaningful integration of living and working with culture, creativity and community. Each of the residents is in charge of a sector of activity. Some of these activities at UfaFabrik include: An International Culture Centre that offers free space for performances; the Neighbourhood and Self-Help Centre, providing assistance with social, health and family matters (services include family care services, a day-care centre, ecology programmes for local school groups and a Medical Centre); The Children's Circus School committed to the development of talented young performers; A Children's Farm (open door for children, keeps animals seldom seen in the city: pigs, chicken, geese, ferret and ponies); A private school; In-house Organic Bakery , Natural Foods Store and Confectionery; a variety of Ecology Projects combining food production and alternative energy systems; The Café Olé. They also organize workshops ranging from parents dancing with their 2-year-old kids to senior citizens practising chinese qi-gong meditation, Aikido and Tai chi skills as well as classes for dance, afro-drumming and brazilian percussion, among others. (Figure 1 - UfaFabrik)

Grote Pyr. The Grote Pyr is the "offspring" of the Blauwe Aanslag, a former tax office squatted in 1980, which was (forcefully) evicted in October 2003. The City of Den Haag offered what is now the Grote Pyr for sale to the former inhabitants of the Blauwe. Since 2002, the inhabitants (20 adults plus 20 children) and user-groups have been busy with the renovation of this monumental school building from 1907 into an ecological freespace. As this building is a national monument, the residents have the legal obligation to maintain the façade and its original characteristics, whereas the majority of the classrooms and the enormous attic are being modified into living and working spaces.

Common spaces are managed and cared by everyone, but this is more than a courtesy amongst residents; according to the set of rules governing the Pyr, each of the residents and companies present has to work 8 hours/month towards the management, maintenance, renewal and cleaning of common living spaces – or pay 80€, in case of unavailability to meet this obligation.

In this place people cook and eat together, share utilities and bits of their lives with each other. They meet together once a month to discuss practical problems, to divide tasks and to monitor the works in the school and the management of the common spaces – as the garden, amongst others.

There are different activities in Grote Pyr, from cultural ones to economic ones, like a blacksmith's shop; a bicycles repair and conversion shop; a biologic catering company; a theatre group; a photography studio; a ballet studio; an interactive museum where children can play with materials and make their own scientific experiments, exhibitions, events and lessons; and a restaurant open to the public.

Grote Pyr represents, for the city, a place of social sustainability and a link between the centre and other zones. (Figure 1- Grote Pyr)

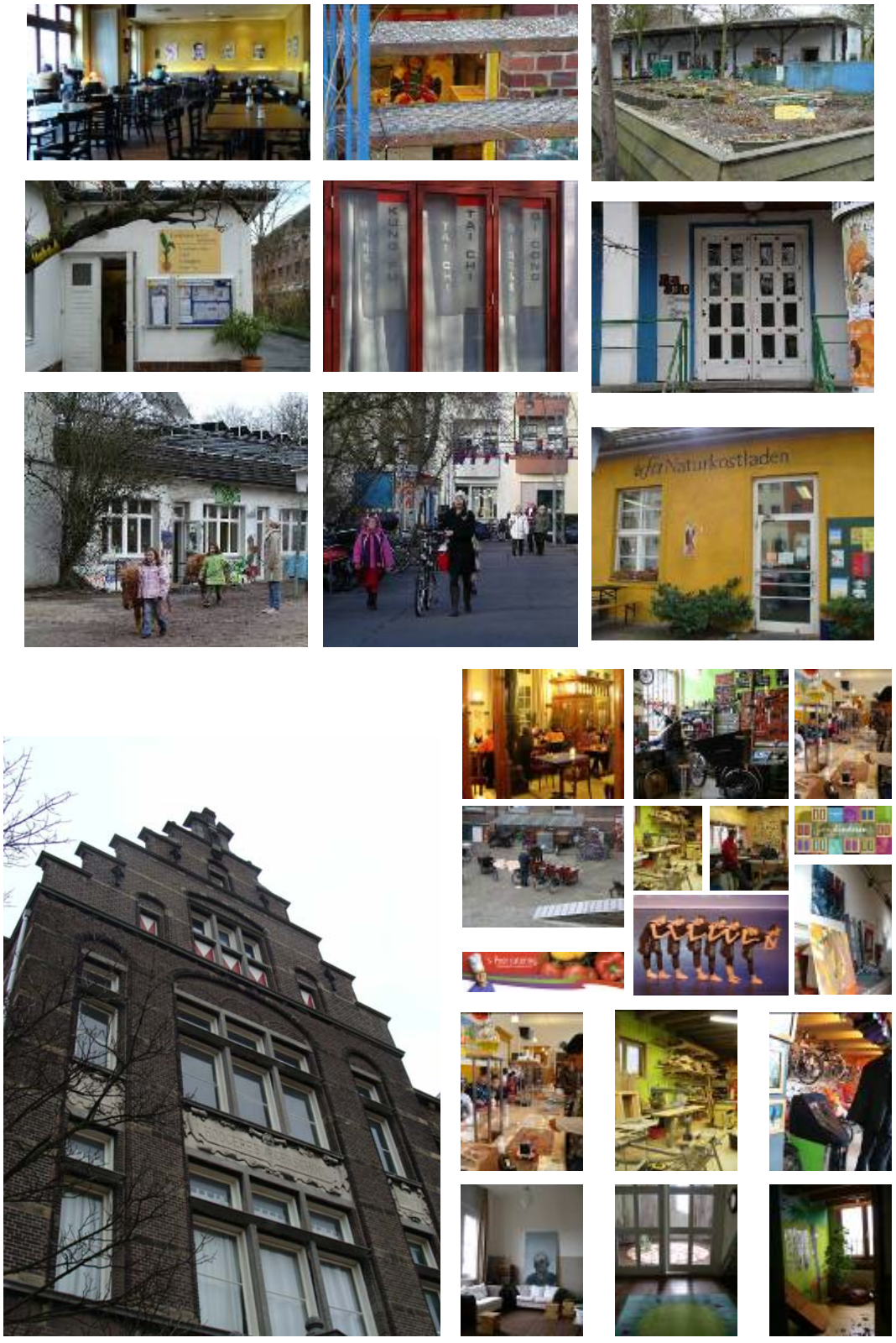

Fig. 1: UfaFabrik (above) and Grote Pyr (bellow)

5. Project *Habitat e Cultura* for Locate di Triulzi

Project's Background. The Province of Milan is proposing a pilot project "Habitat e Cultura" for the creation of a multifunctional centre in the old milk factory of Locate. This centre will host a library, a cultural hall and, at the same time, the headquarters of 20 associations from Locate di Triulzi. Departing from this specific project "Habitat e Cultura", and drawing on international best practices identified through a combination of desk and field research, this investigation will identify and develop optimal strategies for building the necessary infrastructure in which sustainable collaborative services can flourish.

The Habitat e Cultura project is part of a larger programme put in place by the Milan's provincial Directorate of Culture and Integration, constituted of three projects concentrating in the experimentation of integrated cultural systems in the region. It is aimed at creating and activating new cultural instruments for community development, social cohesion and integration.

Context. Locate di Triulzi is a municipality with 9.000 inhabitants in Milan's province, with an area of 12 km2 and just 10 km away from the city centre.

The old milk factory is situated in a strategic location: close to the overground station, accessible through the main pedestrian circuits of the municipality and close the centre but in an area undergoing major residential renewal works.

These characteristics make the Multifunctional Centre a service with obvious supra-municipal potential.

Project's Object and Objectives:

- To build the identity of the Multifunctional Centre, differentiated from the individual identity of its multiple component parts.
- To design the interactions between all the different parties and the management of some internal and shared services
- To access the skills and competences present in the centre and propose collaborative services (developed jointly), maximising the potential of existing resources.

In the first phase of the project's development, a workshop with the associations was organized.

Summary of the Meeting with the associations involved in the Locate di Triulzi's project. The first part of the meeting (introduction) was dedicated at introducing the objectives of the project and showing some case studies able to inspire and stimulate the ideation phase (suggestions). In the second part the association's representatives were asked to share their ideas (team building) and to discuss possible ways in which the project could be developed (brainstorming). The third phase was dedicated at compiling and comparing the participants' ideas in order to promote the dialogue and establish some common grounds (Data organisation). Finally, the importance of creating a differentiated identity for the Centre was discussed (conclusions). To structure the discussion and help in the brainstorming session, the participants were given cards in which they were requested to state their opinions on some specific issues.

Workshop proceedings and results

Atendees. 14 associations:

1. *Associazione Culturale Namastè.* Promotion and comercialisation of fairtrade products and intercultural activities;
2. *Associazione Genitori Insieme.* Training, inetgration, and promotion of the role of the family
3. *Associazione Puer.* Childhood
4. *Comitato Bambini Bielorussi.* Commited to promote the well being of native Bielorussian children
5. *A.N.P.I.*. Anti-fascist movement during World War II
6. *Laboratorio Musicale.* Classical and contemporary musical training
7. *Ass. Artisti Locate*. Arts
8. *Centro Aggregazione Giovanile.* Pedagogical and educational activities for pré-teenagers, teenagers and youth
9. *Ass. Il Centro Culturale Sport &T.L..* Sport
10. *Ass. Teatro Laboratorio La tela del ragno.* Theatre
11. *Gruppo Hobbisti Locatesi.* Hobbies and free time
12. *Motoclub Locate di Triulzi.* Motorcycle enthusiastics
13. *Auser Locate*. Promotion of the active and social role of senior citizens and people with difficulties
14. *Ass. Teatrale Ciclotimici.* Youth Centre's Theatre group

Discussion. From the discussion of the project's objectives and the possible scenarios presented to the participants, it emerged the need to coordinate the existing resources of each association with the new resource materialised in the Multifunctional Centre site, in order to tackle the problems the associations already face and the ones that might arise from the new structure.

The issues that have concentrated most attention were: *accumulated experience*, *space and identity*, *material resources*.

- *accumulated experience.* common activities; more visibility and the creation of a network between the associations.
- *space and identity*. sharing spaces; creation of a new identity for the Centre that is more than the sum of the individual identities of the associations involved; ability to maintain their individual identities, not being dissolved in the Centre's new identity.
- *material resources*. the associations' activities are very different; preference for maintaining their own spaces and instruments; the new reality gives the opportunity to share resources and maximise them, by doing things together; management of common/shared resources; running of common spaces; schedule of each individual association's activities; creation of a structure to ensure the management of the organisational aspects and to distribute responsibilities; create an effective self-management system.

Brainstorming cards. Participants were given cards, which they had to fill in individually, to access their opinions on the following points:

Card nº 1

- What can the Multifunctional Centre mean for Locate di Triulzi? (3 adjectives)
- Propose a name for the Centre
- What can each of the associations do for the Centre?

Card n° 2

Participants organised themselves in groups, with a representative of each association, to discuss the individual results of card n.1, and achieve a consensual group card on the following points:

- What can the Multifunctional Centre mean for Locate di Triulzi? (3 adjectives)
- Propose a name for the Centre
- What are you willing to share (material resources and competences, 5 proposals)

Answers to card nº 2

To Question 1: What can the Multifunctional Centre mean for Locate di Triulzi? (3 adjectives)

The answers to this question are summarised below:

Entertaining

Attractive/ Pleasurable

Culture/new creations

Meeting/gathering/sharing

Diversity/ openness

Driving force/catalyst

To Question 2: Propose a name for the Centre

Some of the names proposed are linked to a specific cultural and territorial context, others highlight a vision of the Centre as a place to create and promote a new community dimension for Locate.

Princess Cristina Di Belgioioso (local history)

Agora (place for public meeting)

The ideas' central (place of doing)

Ideas Factory

The milk factory of ideas

Active level (place "alive" with creation)

To Question 3: What are you willing to share (material resources and competences, 5 proposals)

The participants have shown interest in exploring ways of sharing know-how and resources, and willingness to rethink their own contributes. Points emerged:

Motivation /Responsibility

Efficiency/ Availability

Association's Visibility / Communication

Volunteers

Contacts/Collaboration

6. Proposal for Locate' Milk Factory Multifunctional Centre

Starting with these preliminary results, some proposals have been developed. As this is a participatory project, there will be more meetings with the associations to answer to their needs and to limitations in the project.

Since some of the association's representatives have demonstrated difficulties in imagining some of the possible concepts (like the organizational model and self-management, the sharing of responsibilities and material and imaterial resources, and the offer of joint activities), possible scenarios to materialise those concepts have been developed, ir order to stimulate and feed discussions in the next meetings.

Some of the premisses for the concept and project development derive from a particular historical heritage in Locate.

Premises for concept's development. In the late XIX century Locate di Triulzi was considered a progressive municipality thanks to the social and educational initiatives promoted by Cristina Belgioiso, and it can reclaim this progressive status through the successfull implementation of the Multifunctional Centre and the activities to be developed there.

The pilot project, proposed in the framework of the Habitat e Cultura initiative, can place the Province of Milan, in particular the municipality of Locate, in the vanguard of a worldwide phenomenon as referred in this paper. A phenomenon based in cultural innovative actions that promote social cohesion and integration, community's development, a sense of belonging and collective identity, sustainable behaviours and active citizenship.

The functioning strategy proposed for the Centre is based in the study of strategies adopted in similar cases and in the know-how accumulated by DIS in similar past interventions.

Three functions were identified as a conceptual framework:

- **Cultural** function - the centre as a reference point for cultural activities.
- **Social** function - the centre as a hub for activities with strong social carachteristics.
- **Urban regeneration** function - the centre as a hub for the creation of positive relations between the diffent actors, the citizens and the urban territory in which it is located.

Also, three dimensions were identified regarding the design framework for services & activities:

- **Quality of the human resources** available in each of the associations and their competences
- **Openeness** to the city and its citizens
- **Introduction of the best practices** identified at international level

Proposal. From the cases studied it is possible to extract some models, or a mix of models and the project can be develped at two levels:

1. Management (organisational system & infrastructures' sharing system)

2. Services & Activities (for the local community - offered by single associations and in cooperation with others & monthly activities, workshops, courses, events)

A draft of a system map was developed, detailing what spaces and resources could be shared. In the same way, a draft of a system map was developed regarding possible common activities.

1. Management

Regarding the Organisational system. After the workshop with the associations, the available elements are the number of participants (14), and their area of intervention.

The system of management and organisation should be structured to enable responsibility sharing . A speaker should be elected, in representation of all the associations. This figure is to be responsible for organising a monthly meeting between all the representatives of associations, and representatives of other sectors involved in the Centre's smooth running.

Also to be elected:

Responsible for the management of material resources

Responsible for the spaces' management

Responsible for coordinating and managing the activities on offer

Responsible for the digital platform (both intra and inter net)

Responsible for communications on behalf of the Centre

Positions should be rotated every 6 months, allowing for the participation of all associations.

Infrastructures' sharing system. Besides the Library and the entertainment venue, there are some spaces that can be shared and used by every member of the Centre. A conference room, a meeting room, a storage room and also a kitchen.

A restaurant/café could further open the centre to the local community and forge stronger ties between the centre and the general public, since it is a socialisation place by nature. It can also play an important role in the dissemination of good eating habits and practices.

Regarding the material resources, it is also possible to share the Fax machine, a Copy machine, a DataShow and some Consumables. (Figure 2 – Shared resources)

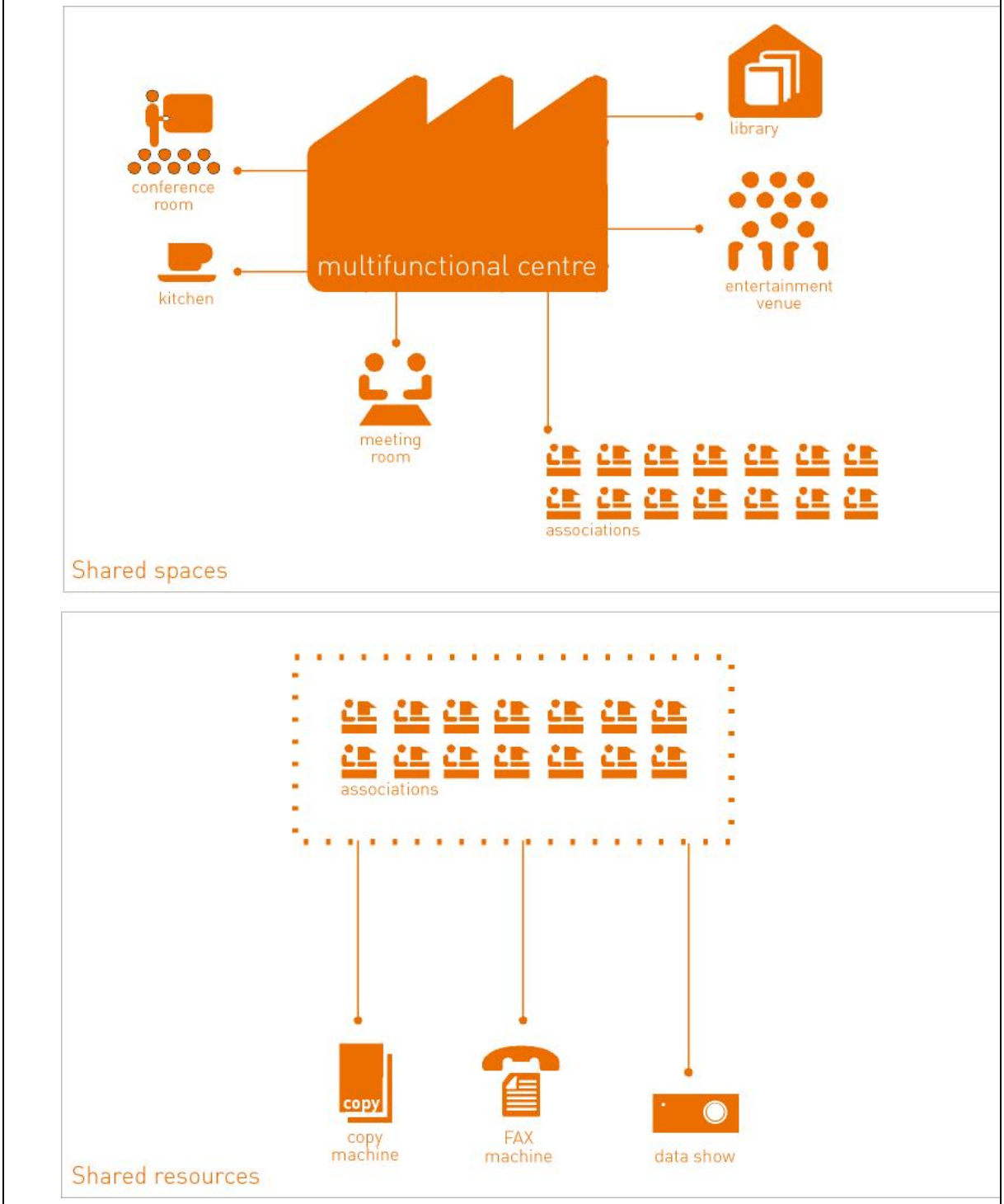

Fig. 2: Shared spaces (above) and Shared resources (bellow)

2. Services & Activities offered by single associations and in cooperation with others & monthly activities, workshops, courses, events

Each association must carry on with their own set of activities, independently of the others, but on a monthly basis they should get together (in groups of 3 or 4) to offer a common activity/project, taking advantage of the existing synergies and competences.

They should organise workshops for a wide public, inviting experts when possible. Participation in those workshops chould be paid, and money should be distributed between participating associations and used to finance the costs of organising them and pay possible guest speakers.

There are some possible activities to be organised in cooperation:

Cultivating a **vegetables garden** – [AUSER + PUER] (Figure 3 – Activity 1)

With this resource, some workshops and eventscan also be proposed by some associations:

Organise lectures/workshops with or for schools about farming, horticulture, etc. [Genitori Insiemi] (Figure 3 – Event 1)

Organization of open days dedicated to gardening [Gruppo Hobbisti Locatesi] (Figure 3 – Event 2)

Prevention & Safety on the roads targeting children and teenagers [Motoclub + Genitori insiemi + Teatro Laboratorio La tela del ragno] (Figure 3 – Activity 2)

Creation of an **intercultural centre**, with multiple activities directed at children. Complementarily, a museum could be created where to exhibit the different national traditions, behaviours and heritage [Namastè + Pro Bambini Bielorussi + Laboratorio Musical + Artisti di Locate]

. Creation of a lab for the development of creative skills [Musical Lab+ Gruppo Hobbisti Locatesi + Teatrale Ciclotimici]

Monthly they could offer workshops teaching how to play musical instruments and acting. These could be on offer for scheduled school visits, or could be held on a regular basis, to a wider public.

In the **Library** it can be created by all associations a Reading club and Ludic centre, and a shop of second hand books offered by the local community.

Reading and acting of children's plays [Teatrale Ciclotimici + Teatro Laboratorio La tela del ragno]

In the common **Kitchen** there could be also some culinary workshops, with the participation of other associations and the wider public – like ethnic cuisine workshops to foster integration and awareness of the other.

For instance, the NAMASTE association could sell their products to the restaurant, and could even, depending on the garden's size and production, organise an organic garden to supply the restaurant – or at least some specialities.

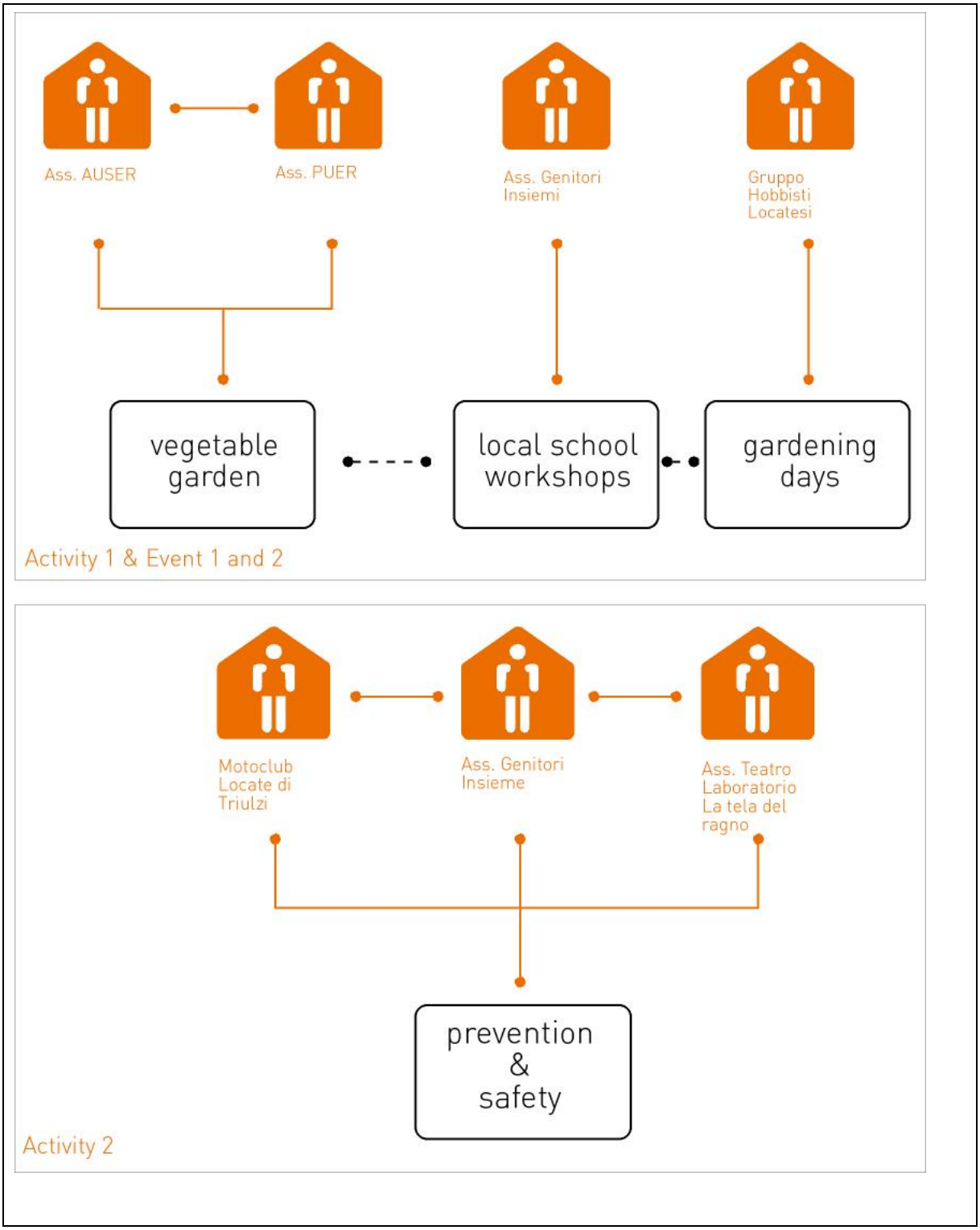

Fig. 3: Vegetables Graden & Events (above) and Prevention & Safety Day (bellow)

These are some of the possible scenarios that can be developed in the Centre. Nevertheless, all proposals will be developed on a participatory basis,i.e, with the inclusion, participation and feedback from all associations involved.

Preliminary conclusions. This is an early stage of an on-going project and only after the meetings with the participating associations we will be able to define a more detailed brief.

As a first observation we highlight the resistance on the part of some of the participants to the idea of sharing spaces and resourses, due to the fear of loosing identity and independence. The difference from the case studies analysed is evidently the existence of a physical space being offered by local authorities. In the cases of Ufa Fabric and Grote Pyr, the participants had common goals, but lacked a place where to develop them. In Locate the opposite occurs - the associations have their own individual headquarters spread in the territory, and pursue their own specific goals. The idea is to enhance their output by allowing them to benefit from each other's skills and competences, creating synergies that impact positively in their common goal of providing a service to civil society.

On a more positive and inspiring note, other associations, more open to the idea, regard this option as an opportunity to introduce innovation in their activities.

"…creativity is often highly conversational and so innovative societies need to be populated with spaces, real and virtual, where people mix, publish, talk and debate. (…) Without such public platforms society becomes balkanised, sectarian, and divided" (Leadbeater, 2006:9)

7. Conclusions

For too long urban design involved only architecture and land-use planning. Now other professions began to form an essencial part of the city-making. We have learned that the physical alone does not make a city or a place (Landry, 2006). So our vision of a possible city is based in the idea of a Collaborative City.

In a closer look to this city, we discover its severals hubs, in particular places made of and by people, which work as creativity incubators, laboratories of new cultural experiences, centres of social and solidary dynamism where new economic models are being forged.

Places where people lead sustainable lifestyles, and from where they are able to show to the remainder of society how traditional ways of life can be changed.

Amongst the possible approaches to sustainable development, we give a special focus to the design of services oriented towards new social models, in order to develop and strengthen cultural identities and sustainable lifestyles. In this sense, the innovation driven by design operates within an integrated system, with multidisciplinary teams that can help to build new social scenarios. These scenarios presuppose new attitudes towards the unsustainable patterns we adopted, implying new business strategies and new ways of promoting quality of life and well being. This scenario offers design a different approach and a new opportunity to develop and enhance a sustainable future.

Design is about culture and creativity, is about problem solving, and these "projects" are solving problems arisen from everyday activities that people have to carry out in this complex society.

In these framework design should act as an interface between two levels (top-down and bottom-up initiatives), for top-down initiatives are strategic whilst bottom-up ones are more tactical or operative. Design has the capacity of being both strategic and tactical, this means that design can potentiate people's and government's visions, creating scenarios according to those same visions, benefiting city life in meaningful ways.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

DEEDS: *a new Teaching & Learning resource to help mainstream sustainability into everyday design teaching and professional practice*

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Abstract

The DEEDS (DEsign EDucation & Sustainability) project, funded by the European Union Leonardo da Vinci Programme, comprises a partnership of five institutions from the European design and sustainable development communities, embracing Higher Education, research and practice. This paper outlines the background, evolution and outcomes from the project which currently include a set of core principles, SCALES, diverse resources available via a web site, an evolving Teaching & Learning landscape of 'pods' (the Pod-scape), new student projects, and more. DEEDS has embraced a platform of mutual learning by engaging diverse members of the design communities, with various actors and stakeholders to create a participatory platform for embeddiing 'sustainability into design and design into sustainability'.

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1. Introduction & background

The first post-modern design manifestoes referencing ecological imperatives emerged in the 1960s (Jencks and Kropf, 1997). Green and ecological design in the late 1980s evolved into eco-design and Design for the Environment (DfE), with an emphasis on eco-efficient ways of designing. By the late 1990s, the canon moved on as Design for Sustainability (DfS) gained credence. DfS in this context is understood as comprising a wider spectrum of objectives, adding a social, institutional and ethical dimension to eco-design. Sustainability in this view is a complex concept involving four axes or dimensions: environmental, economic, human/social and societal/institutional [Fig. 1], making it probably the most difficult governance orientation ever suggested (Spangenberg et al., 2002). Little wonder then, that DfS, 'sustainable design', or 'sustainability design', still lingers on the outer boundaries of design education and practice (see for example in the UK, Otto 2003, Richardson et al 2005; in Denmark, ICIS/University of Lund survey 2005). Observing this lack of progress led the International Centre for Innovation and Sustainability (ICIS) in Denmark, to see the need for a transition solution and apply to and receive funding from the European Commission Leonardo da Vinci community Vocational Training Programme to set up the DEEDS (DEsign, EDucation & Sustainability) project. DEEDS comprises five partners: ICIS, SERI (Sustainable Europe Research Institute Germany e.V.), BEDA, (Bureau of European Design Associations), University of Brighton and the Academy of Fine Arts, Poznan from five EU countries, Denmark, UK, Germany, Poland and Belgium. DEEDS primary aim is to 'Integrate Sustainability into Mainstream Design Education and Design Practice in the EU Countries' by improving the skills and competences of design educators and practising designers, and the quality of, and access to, continuing vocational training for the target groups. The aspiration is that DfS can be inspired, inspiring and innovative in helping, through and with design, to deal with sustainability issues that figure prominently in the public and political domains, and help the EU meet its strategic sustainability objectives expressed in the EU Treaties.

Indeed, DEEDs activities are already influencing the EU policy agenda with the better integration of sustainability into BEDA's lobbying role and its potential inclusion as a fundamental component of the design policy for Europe which BEDA is currently working towards with the European Commission.[6]

The final outcomes of the DEEDS project will encompass an open source website and a manual including case studies, educational models and methods, tools and skills which will demonstrate and teach DfS to the target groups.

2. Early phases of the project

Early research sought to understand (by literature survey, questionnaires and workshops) the barriers and needs to implementing sustainability beyond rhetoric for the two key audiences, design teachers in Higher Education and designers in professional practice. This process guided the early development of the web site, (DEEDS, 2007-

[6] Following BEDA's meeting with EU Commission President Barroso and Commission Vice President Verheugen in October 2007 and January 2008 respectively, the Commission has indicated that it will produce a 'Communication on Design' in 2009.

2008) generating a platform for presenting theory and T&L models. Concurrently, DEEDS set about determining the underlying principles that might guide the creation of a Teaching and Learning resource for these audiences. DEEDS believes that sustainability is complex and holistic requiring people to understand, imagine, design and solve problems together or in synergy, addressing the different aspects and interrelated levels of the contexts involved (see for example Fuad-Luke; Manzini; Walker; Wood in Chapman & Gant, 2007; Wood, 2006; Manzini and Jégou, 2003).

3. Needs & barriers of key target audiences

The UK Design Council's report (Richardson et al., 2005) highlights the typical barriers, real and perceived, cited by design practicioners and educationalists [Table 1]. Their findings for educationalists are supported by Dawe et al (2005) who identified four major barriers to the successful embedding of Education for Sustainable Development, ESD: overcrowded curriculum; perceived irrelevance by academic staff; limited staff awareness and expertise; and limited institutional drive and commitment. Evidence from architectural design, for instance, noted various barriers & obstacles (Fowles et al., 2003):

- The professional bodies, ARB/RIBA, acknowledge sustainability in their validation criteria but it is compartmentalized and relegated to technology subjects rather than integrated into professional practice and/or a cultural context.
- Design tutors tend to have a defensive attitude towards sustainability, especially in areas where they don't have the expertise.
- Architectural design educational culture tends to encourage the expression of the ego through formal design, whereas more emphasis needs to be placed on societal and global needs.
- Sustainable design is tangential to rather than embedded in mainstream architecture.

Iball (2003) found that many post-graduate courses in architecture emphasized technical and quantifiable environmental issues, but neglected a wider, more holistic, educational response in environmental, social, economic and cultural terms as needed for substantial sustainability. The same general observation was made during worldwide (English speaking) survey of post-graduate courses in eco-design/sustainable design with a product orientated focus (ICIS/University of Lund, 2005).

The authors of this paper have experienced a variety of responses when giving lectures about DfS from well-renowned design colleagues, i.e. comments like 'teaching DfS is a dogma which does not further creativity'.

There seems to be a myth attached to 'sustainability issues in a design context' among many design students, teachers as well as professional designers, which places sustainability in a box of non-creativity, restrictiveness, 'old hat' and other metaphors from previous decades.

An invited panel of external critics, comprising design practitioners and educationalists attended a workshop in Brighton, UK in May 2007 (DEEDS, 2007) and

with the Partner team, together defined the barriers [Table 2] under the socio-cultural, political and economic categories of money, structural/institutional, education, consumers and cultural temperature/human values. They also invoked the 'silent witness' of the neglected environment, aka nature. This collective perception of the barriers clearly demonstrates that the task of mainstreaming sustainability into design will inevitably require professional *and* personal transformations in thinking and behaviour.

This idea was further supported by the findings of the survey conducted by the Bureau of European Design Associations (BEDA) which was targeted at practicing professional designers. To reach this audience, (no survey was conducted of either design schools or client companies), BEDA surveyed its professional design association members across Europe (20 members of a total of 39). The questionnaire comprised only 4 key questions (being mindful of how difficult it is for practising designers to find time to complete a questionnaire) and it was issued in Danish, Dutch, English, French, German, Italian, Spanish and Slovenian to increase the response rate. The questionnaire is set out in full at Appendix 1. 283 individual responses were received from 14 European countries (listed at Appendix 2). The breakdown by design discipline is at Appendix 3 and some analyses of the questionnaire are given in Table 3.

From the responses received to the Question 3, "As a professional designer, what do you believe are the greatest barriers to practicing sustainable design?", (where a score of 1 indicates no barrier and a score of 10 indicates a significant barrier), it could be inferred that the three key barriers to the application of DfS/Sustainable design set out in the question did indeed resonate with respondents.

Just under 50% of all respondents scored 6 and higher for the barrier, *'lack of knowledge of designers'* with the largest number scoring on 5 (22.3%), perhaps indicating that whilst designers feel their own knowledge to be insufficient, they are hesitant to be too critical of their own practice [Table 3a],. Only 28% suggested that designers have adequate or sufficient knowledge, (scoring between 1 and 4).

On the other hand, for the barrier, *'lack of knowledge of clients'*, [Table 3b], 75% of respondents scored 6 and higher with just over 24% scoring 8 and 21% scoring 10, perhaps indicating that the profession as a whole perceives the client's knowledge of sustainability issues to be inferior to its own and the clients' lack of knowledge to be a greater barrier to sustainable design practice than their own lack of knowledge.

Regarding the barrier, *'lack of training at design school'* [Table 3c], just under 63% scored 6 and above with the largest percentage (nearly 19%) again sitting on the fence and scoring 5. These two scores combined total 81.5% of the respondents scoring 5 and above – thus expressing their perception of the need for better training of sustainability issues at design school, (indeed just over 16.5% scored 10 – quite a large percentage thus perceiving design school training to be inadequate).

The questionnaire (Question 2) also provided some insight on the profession's view of its own access to tools and process to support the implementation of sustainable design practice [Table 3d], where a score of 1 represents, 'we have no tools and processes', and a score of 10, 'we already have sophisticated and proven tools and processes', only 3.83% scored 10. Indeed, only 36% of the respondents scored 6 and higher with the largest group (24.4%) scoring 5. Nearly 28% scored between 1 and 3

with a total of just over 64% scoring between 1 and 5. This infers that whilst designers believe they have some knowledge of design for sustainability, they are both less confident about developing tools and processes to facilitate the implementation of that knowledge, or do not know where to find them, (or that their perception is that the tools are few and/or simply do not exist).

A picture was gradually emerging concerning the needs of the DEEDS target audiences. The importance of understanding the motivation and incentives was paramount [Table 4], as was the importance of 'value addedness' of sustainability in the design context. While there were varying lexicons to describe the different target audiences, the promise of something new, inspiring and innovative that improved future job prospects seemed common benchmark incentives.

Most users of the DEEDS web site and resources want something they can immediately use to create 'positive impact' (answers; tools; solutions; examples). They also want to be empowered with new competences – a serious challenge, as this often neglects the learning need associated with developing a broader, sustainability-based approach.

Design educationalists/teachers can be motivated and attracted to sustainable design by helping them to reduce their workload, giving them new methods and T&L learning models while enhancing their status and job satisfaction by adding new dimensions and challenges to their intrinsic assessment and evaluation criteria.

For design practitioners to be motivated to learn about and implement sustainable design practices they need to see a clear connection to an increased potential for business growth. Design companies need to be able to demonstrate greater added-value for their clients, as well as gaining benefits for their own companies in terms of better-quality projects and outcomes. They need to see the link to the increased turnover (preferably with improved profit margins). Where they see a powerful additional; ingredient to their offer, (supporting distinctiveness in a very competitive marketplace and /or aligning with the procurement policy requirements of sustainability aware clients), designers will be more easily attracted to integrating sustainable design into their every-day practice.

Design students can be motivated and attracted to sustainable design by showing them how it improves their employability and challenges their creativity by widening their horizons.

Two hypothetical examples demonstrate how needs can be met by understanding the barriers and motivation:

Teachers & students

Motivation: HEIs (Higher Educational Institutions) are often cash poor. Teachers need to look for external funding and yet are also trying to get work experience/placements for their students.

Means to overcome barrier: By finding an external client that would partner in setting a competition for the students, generating positive outcomes for the teacher and the client.

Designers

Motivation: Materials, choice of materials are central to how a designer operates.
Means to overcome barrier: By re-positioning and re-educating about 'sustainable materials' – where aesthetic, form, properties, and cost can be set against environmental & social costs; where it can be demonstrated that choice of a 'sustainable material' saves their clients money and is an important task demanding awareness of a wider context.

4. SCALES, the core principles for the DEEDS T&L approach

DEEDS derived a generic systematique of themes reflecting the complexity and multi-dimensionality of the sustainable development concept, 'SCALES', that need to be addressed when considering how design can positively impact on sustainability (DEEDS, 2007; Spangenberg et al., 2007).

SCALES is a complementary set of 24 principles based on:

- **S**kills (S – nine principles = 3 x 3 principles)
- **C**reating change agents (C - 3 principles)
- **A**wareness – systemic and context (A – 3 principles)
- **L**earning together (L – 3 principles)
- **E**thical responsibilities (E – 3 principles)
- **S**ynergy & co-creating (S – 3 principles)

SCALES was compared with other systematiques for ecological and sustainable design published since 1968 [Table 5]. The foci for manifestoes up to 1992 was largely around a holistic approach, awareness of system and context, and eco-efficient production and resource use. Post 1992 more emphasis was given to ethical responsibilities, ideas of learning together, and synergy and co-creation. The DEEDS principles embraced additional focal areas – the importance of communication and leadership, user empowerment, social aspects and the creation of change agents – and appear to be the most comprehensive set of guiding principles addressing the challenge of designing for a sustainable future(s). Later SCALES was exposed to critique in workshops by design teachers, and their students, and design professionals leading to their current iteration on the DEEDS web site. (DEEDS, 2007-2008):

Skills

DEEDS points to different skill sets:

Special skills- the holistic approach: Vital for the DfS process is the context, the interrelatedness of the different levels and aspects of the design problem and processes. It is important therefore to define and analyse problems from multiple perspectives including the four dimensions: economic, social, institutional and environmental.

Special skills related to eco-efficient and eco-effective production and resource use by developing LCT, LCA and cradle-to-cradle skills, become familiar with technological advancement, dematerialisation, zero carbon considerations, new and sustainable materials, and, waste considerations. Of equal importance is the integration of efficient service provision by designing Product-Service-Systems (PSS) and maximising consumer satisfaction by appropriate material/dematerialised option that expands user experience, emotion, relation, pride, self-esteem and awareness.

Finally special skills related to communication issues as well as leadership, are vital for the advancement and integration of sustainability practices in societies. Designers to become leaders, capable of communicating and presenting the contexts, the considerations, the pros and cons, working with clients, customers and other relevant disciplines such as engineers or economists. Making a real impact by understanding the context and culture of the stakeholders, and be able to demonstrate and communicate the importance and advantages of sustainability.

Creating change agents

This principle encompasses the understanding of the expanded field of design and its processes when implementing sustainability. The designer, in particular by using the networks (s)he commands and by fully understanding and communicating the value-added outcomes of DfS, becomes the change agent and also equips the client to become a change agent, yielding first-mover benefits. This can be achieved by using approaches which provide significant, immediate and visible benefits for the client and consumers/society through CSR, ethical consumer behaviour, cost cutting, competitive edge, waste and energy reduction.

Awareness – systemic and context

Awareness is step one in DfS. Conscious choices re design concepts, production processes, materials, energy usage, generation of waste and end-of-life scenarios are the first real steps a designer can take. To design in context, be aware of connections and consequences is a precondition for providing maximum consumer satisfaction with a minimum of negative environmental impacts (even in mass production) and a positive balance of social effects. For this behalf, positive and negative impacts, feedback loops and side effects must be taken into account.

Learning together

Sustainable design is based on co-creation, co-design, synergistic learning. Social innovation practiced and promoted more and more by designers is only possible through mutual learning, team working, inter-and trans-disciplinary thinking and practice. Reciprocity, T&L through participation involving stakeholders, form the foundation of sustainable solutions. More and more design companies engage in this way of designing, where the designer becomes the facilitator rather than the creator of design solutions – a challenge to design's collaboration and communication capabilities.

Ethical responsibilities

An ethical design company creates design solutions that do no harm (responsible design, with integrity), but contribute to a sustainable way of a “good life”.
An ethical design company offers design that enhances personal standing and acceptance, and thus social sustainability and encourages user involvement (consumer empowerment. It develops practical, functional and fun design (experiences not objects)

The ethically responsible design company is no longer a figment of the imagination of design visionaries, but a concept which design companies will have to decide to embark on sooner rather than later. As CSR (Corporate Social Responsibility) is becoming an integral part of company’s culture and business in general, the design company will have to follow suit in more than wording or could loose potential clients/market.

The professional design associations have the opportunity to promote sustainable design practice through their individual members across Europe. Indeed there is evidence that some are already incorporating sustainability criteria as a requirement of membership and it is hoped that this trend will continue to grow.

Synergy & co-creating

The imperative is to engage in synergistic collaboration. Competence clusters are practiced with great success by a number of companies in the EU. Partnerships, collaboration, sharing and including stakeholders in development of design solutions are essential elements in the implementation of sustainability and DfS. Therefore, it is necessary to engage the client, the suppliers, the consumers and the community.

SCALES offers a most comprehensive set of criteria that:

- embraces the scope of previous criteria yet adds new ones found to be essential when understanding DfS as a broader challenge than DfE**;**
- can be easily adapted and 'owned' by an individual or a group, initiating a process of learning by doing;
- can form a reference point to demonstrate how case studies embed the principles;
- allows for each principle to become the basis of a teaching module and/or an example case study;
- provide a philosophical and practical foundation for a pluralistic approach to developing DfS T&L pedagogy and practical tools serving as a benchmark.

;

5. The Pod-scape

Within the guiding ethos of SCALES and its inherent complexity, using the knowledge the project partners have collected about their target audiences, the DEEDS partners are developing a concept for a web-based Teaching and Learning (T&L) resource involving 'pods' that are located within a 'pod landscape' or PodScape.

We envisage that the PodScape will comprise the widest possible range of contributions, including resources relating to:

- pedagogic research, theories, approaches, and experiments in sustainable design education
- the practical implementation of sustainability in design education (e.g. project work, case-studies, best practice, partnership with industry);
- political, institutional, and philosophical aspects of sustainable design education.:

Pods can be created by DEEDS or by web visitors using a guide that encourages the creators to consider the new thinking, behaviour, practical outputs and experimental forms including concepts, prototypes and one-offs. Each pod is 'tagged' with information that enables other pods and other parts of the landscape to be connected, revealed and/or explored at a macro or micro scale and users will be able to navigate the PodScape according to their specific needs, either slowly, quickly, randomly or co-operatively, enabling learning by doing, by experiencing and/or by participating.

6. A new Unit of Study at the University of Brighton

As an outcome of involving various design disciplines in the on-going dialogue within the DEEDS project, a new Unit of Study (UoS) is being created in the architecture programme of the School of Architecture and Design at the University of Brighton. The envisaged 'Sustainable Practices' unit will be an integral part of the undergraduate curriculum in architecture. The motivation for introducing this new unit comes not only from the increasing awareness of the importance and potential benefits of DfS education amongst lecturers, but the growing demand by students to bring sustainability thinking into design education in a holistic fashion – as a positive, generative principle rather than an afterthought. Consequentially a group of lecturers has begun to think about ways in which existing, but isolated DfS teaching elements and expertise in various subject areas (studio-design, technology, history and theory) could be inter-linked, expanded, and turned into a common ground for future DfS teaching. The new Sustainable Practices unit is a first step in this direction: it will be staffed by tutors from the different areas, with additional input from programme-external lecturers; it will enable students to develop a holistic and creative understanding of sustainability in design; and it will act as a catalyst for the development of new, sustainable forms of design teaching across the programme. The unit will also work with, and contribute to, the PodScape. Importantly, these efforts are part of a fast growing movement across the University that promotes sustainability thinking in general and the integration of ESD into the curriculum in particular, and has lead to the recent establishment of a University-wide Sustainable Development network.

7. Co-design at the Academy of Fine Arts, Poznan

Students have been engaged in several projects to test T&L approaches within the DEEDS project, in particular the co-design approach, and tools, such as the LiDs or eco-strategy wheel (van Hemel 1994). Co-design is seen as a design approach involving participation of various actors and multi-stakeholders in the design process that is starting to be applied to commercial and social projects (Fuad-Luke 2007, pp38-43; Thackara 2007, pp70-73) Co-design is *'predicated on the concept that people who ultimately use a designed artifact are entitled to have a voice in determining how the artifact is designed',* (Carroll 2006).

Second, third and fourth year students commenced a project entitled 'Humanizing Space',in cooperation with the Poznan International Fair, in which they applied sustainability techniques to the design thinking. The project site concerns a new public space linking the four halls at the Poznan International Fair exhibition centre. Recent revitalization has made it possible to achieve a roofed space, where an existing avenue of linden trees was retained untouched. Architectural design concerned spatial arrangement and merging the elevations of existing, recently rebuilt halls, which have different dimensions and which were built in different periods. The whole area has been covered with a glass ceiling of an interesting construction.

However, the area achieved does not fully measure up to the expectations, and the objectives, and the functional arangements are unclear and complicated. The whole project requires a clear, holistic design conception of the interior, which would allow effective use of the new conditions to improve the comfort of the users. To this end the students undertook a survey of the site and interviewed many of the stakeholders involved in order to obtain their input into generating appropriate design briefs for interventions in the space that would help humanise it. Detailed designs were generated by the students who later applied a modified LiDs wheel to improve the eco-efficiency considerations of their concept designs. Student outcomes [Figs. 2a, 2b] demonstrate that 'the sustainability context expands the boundary of what design is, what it does and also who is involved….' (Fletcher & Dewberry 2002).

The project is one of three parallel eco projects at the Academy of Fine Arts in Poznan, It helps to change the awareness and sensibility for the sustainability thinking among students, young professionals and the teaching staff.

8. Concluding observations and remarks

This paper provides an interim snapshot of the basic approach and some of the achievements to date in the DEEDS project. It is expected that more substantial content will be uploaded to the web site by the time this paper is delivered. The observations and remarks to date should be seen as a work-in-progress. However, the DEEDS project is a significant positive development in the evolving story of Design for Sustainability (DfS) teaching and practice. It embeds an approach predicated on the idea that participation by designers with each other and with a variety of actors and stakeholders, is key to maximizing the value-added that design can offer to the socio-economic and political journey towards more sustainable ways of living and working, while helping to regenerate the environment, strengthen social cohesion and fostering international justice (the latter being the economic/institutional dimension of sustainability). The power of the DEEDS project is that it has evolved through a process

of *mutual learning*, between the partners themselves, and between the partners, target audiences and other stakeholders. This has generated some positive complementary outcomes - an extensive set of principles (SCALES); a diverse and growing set of resources on the DEEDS web site (DEEDS, 2007-2008); changes in T&L practice at the two Higher Education partners in the DEEDS project; and a participatory T&L landscape, the Pod-scape. At the root of this on-going process is the belief that the diverse design communities of Europe all have something to contribute to the understanding of the potentiality of *'embedding design into sustainability and sustainability into design'*.

In order to encourage dissemination of the results of the DEEDS project, and to encourage wide use of the resources generated, there are a number of key conferences and events in Copenhagen, Denmark (October 2008) London, UK (Sept 2008), Brighton, UK (Sept 2008), Poznan, Poland (October 2008), and Brussels, Belgium (November 2008). The challenge is to get the designers of Europe involved through these events or by accessing and contributing via the web site. While the European Union's Leonardo da Vinci funding for the project finishes in October 2008, the partners' intention is for the DEEDS project to continue to grow beyond the life of the project itself through increased participation. It is their hope that, in the near future, DEEDS can become a home for a better-informed, Europe-wide understanding of the significant opportunities for design that exist through embracing and integrating sustainability behaviours and know-how, which in turn, will help to future-proof those who contribute to the design industries and design communities both in Europe and beyond.

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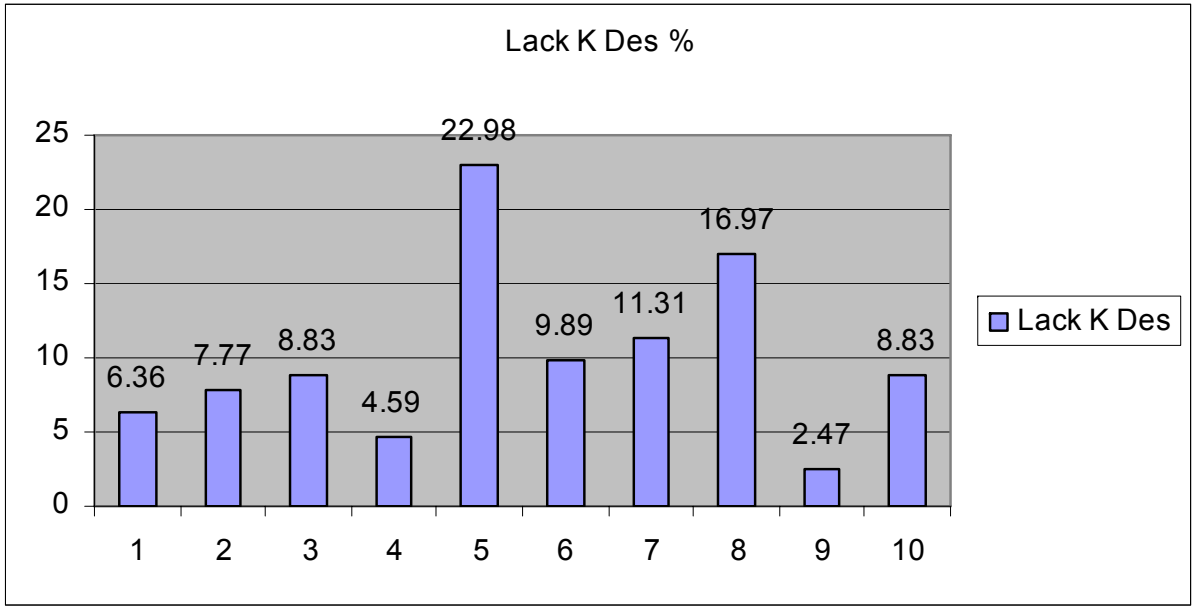
Table 1. Perceived and real barriers to designers and design educationalists applying sustainable design, after Richardson et al (2005).

Barriers for designers • Requires larger skill set • Designers not in influential positions • Unpopular/misunderstood • 'Tough sell' to consumers/clients • Perception of higher cost of Sustainable Product Design (SPD) • Lack of appropriate tools/methods • Lack of government support • Lack of consumer demand •
Barriers for design educationalists • Low level of student demand • Low level of HE institution interest, understanding &/or perceived importance, therefore little support • Low level of business demand • Low level of government support to encourage demand/curriculum change • Broad and specialist skill set (30 listed skills) • No or poor track record of graduate employment as sustainable designers • Lack of stature for design in the marketplace • Sustainability currently not seen as part of mainstream design education • Lack of appropriate tools/models and/or formal knowledge sharing network to aid students/practicioners • Lack of skilled lecturers/tutors • Lack of entrepreneurial know-how • SPD requires lifelong learning • Knowledge exchange network poor beyond specialist individuals and centres • Poor eco-literacy in school students

Table 2 - Barriers/obstacles perceived by DEEDS and external critics

Money • Ambition… • Vision… • Growth (economic) • Economic focus on mainstream/ideological ignorance • Lack of resource, time/money • That it costs more • Lack of critical mechanism to identify SD priorities • IP data methods, adendas, funding • Economic-political system/structures/values • Perceived risk by business and self-regulation that pre-empts legislation • Producers and manufacturers have to invest • Risk for the companies to invest and re-think
Structural/institutional • Synergy… • Process… • Limited capacity to risk 'out of the box (Designers) • Lack of institutional support • Lack of (democratic) participation • Vested interests, 'silos' wih power • Glass boxes • No time (ICT overload?) • Perception is fear/frustration not fun/fulfilment • Too many fragmented initiatives
Education • Lack of knowledge • Quality and dissemination of information regarding resources & impacts • Schooling vs education • No knowledge about sustainable thinking/living • Lack of 'confrontation'/'visceral awareness' • Lack of feedback at the point of consumption and hard to analyse remote impacts

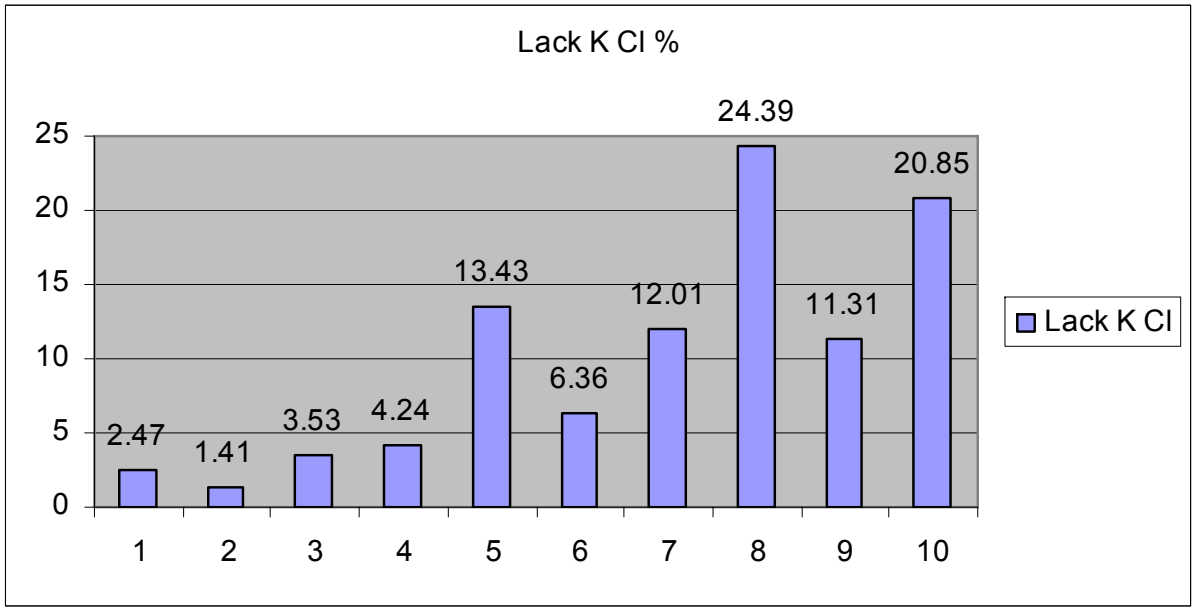
Table 3a - BEDA survey of design associations' members – Scores against, ‘Lack of knowledge of designers’



Score 1 = no barrier; Score 10 = considerable barrier

Response Expressed as percentage

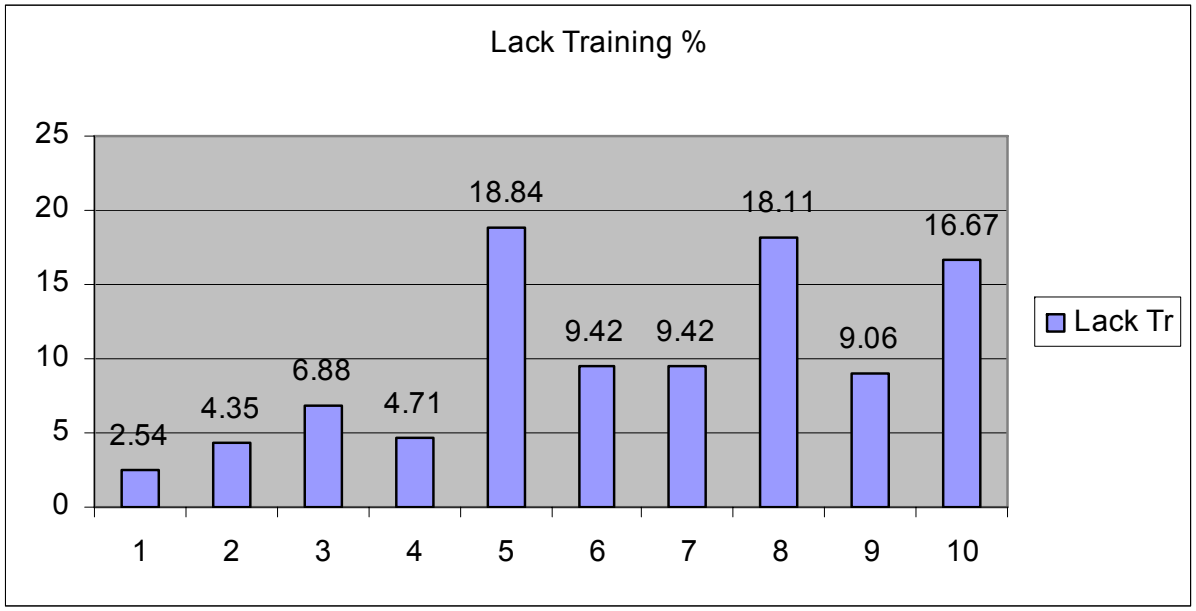
Table 3b - BEDA survey of design associations' members – Scores against, ‘Lack of knowledge of clients’



Score 1 = no barrier; Score 10 = considerable barrier

Response Expressed as percentage

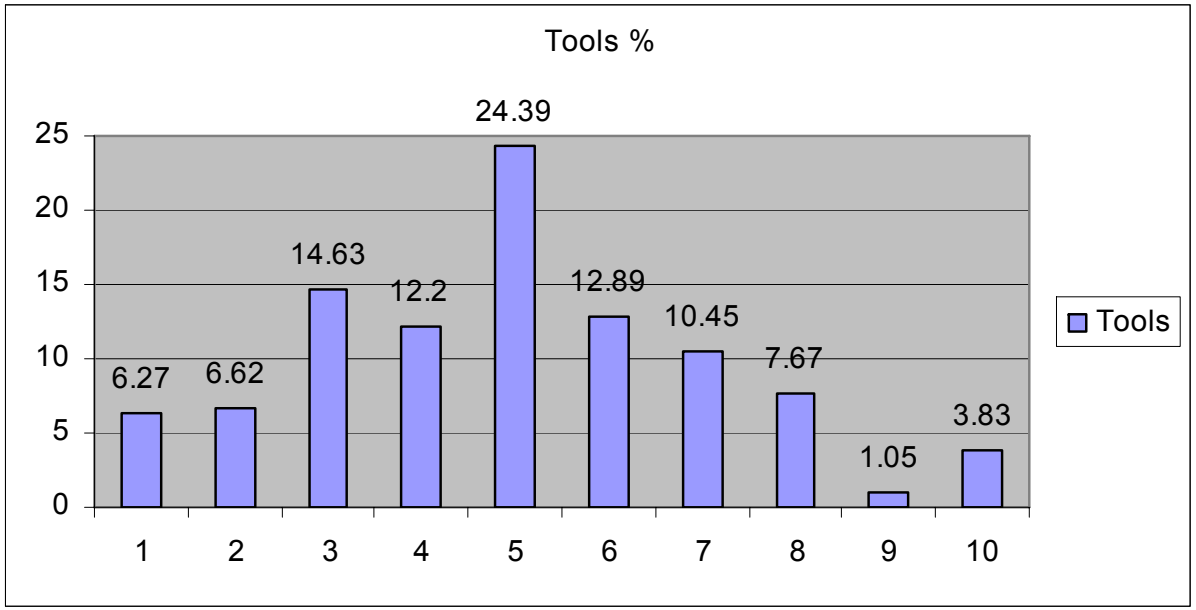
Table 3c - BEDA survey of design associations' members – Scores against, ‘Lack of training in design schools’



Score 1 = no barrier; Score 10 = considerable barrier

Response Expressed as percentage

Table 3d - BEDA survey of design associations' members – Scores against, ‘Necessary tools and processes'



Score 1 = I/we have no tools and processes; Score 10 = = I/we already have sophisticated and proven tools and processes

Response Expressed as percentage

Table 4 Incentives for target audiences to adopt sustainable design

For Designers: 'Beauty' The other shoe (insight) A new aesthetic for the 21st century All at once: 'Beautiful, smart, functional, sustainable' The business case From product to service relationships Deep breaths happily taken – happier practice Competitive advantage CV points Additional transferable skills Original, inspired, innovative A new space to play in
For Teachers & students: Education v schooling Raising awareness Creative expression without harm Guide for the future Design=art=architecture for society Greater employability Fairness, equity Improve skills + increase knowledge > good life Chance for better education=chance for a better life
For Students: Education v schooling Teaching the young Trigger systemic change Raising quality of design Greater employability Co-operation and rationality Reframe the status quo

Table 5. Comparison of DEEDS core principles with previously published green design, eco-design, ecological and sustainable design systematiques

Date Author	Special Skills									Creating change agents			Awareness – systemic & context			Learning together			Ethical responsibilities			Synergy & co-creating		
	Holistic approach			Eco-efficient production & resource usage			Communication & leadership																	
	S1	S2	S3	S4	S5	S6	S7	S8	S9	C1	C2	C3	A1	A2	A3	L1	L2	L3	E1	E2	E3	S1	S2	S3
1968 McHarg	X	X	X								X	X	X	X	X									
1984 Todd & Todd	X	X	X	X	X	X							X	X	X									
1986 John Elkington Associates	X	X	X	X	X	X							X	X						X				
1991 Team Zoo Atelier Zo	X	X	X	X	X	X							X	X	X									
1991 Vale & Vale				X	X	X																		
1992 McDonough	X	X	X										X	X	X	X	X	X	X	X	X	X	X	X
1996 Burrall			X	X	X	X								X										
1996 van der Ryn & Cowan	X	X	X	X	X	X							X	X	X	X	X	X				X	X	X
2001 demi			X	X	X	X							X	X	X	X	X	X	X			X	X	X
2002 Fuad-Luke		X		X	X	X					X			X		X	X	X	X			X	X	X
2004 RIBA				X	X	X													X					
2004 Pre	X	X		X	X	X													X		X	X	X	X
2004 Ryan				X	X	X								X										
2007 Chochinov	X	X	X	X	X	X							X	X	X				X	X	X	X	X	X

Phrases, or words, that the above sources mentioned but that are absent from the DEEDS core principles :
Bio-regionality, diversity, symbiosis, fitness/fitting, emotional – senses, balance, humanizing designs, respect for place/site, respect for users, humanity and nature co-existence, respect for material & spiritual connections, safe objects, understand limitations of design, humility, responsive to locality (place & people), regenerate don't deplete, make nature visible, involve all stakeholders, design adaptable to future needs, identify and satisfy real needs, ask 'why?' and 'why not?', preserve and restore 'natural capital', move from products to product-services.

Fig. 1 :The 'sustainability prism'. Source: European DataBank Sustainable Development, http://www.sd-eudb.net/ accessed May 2008

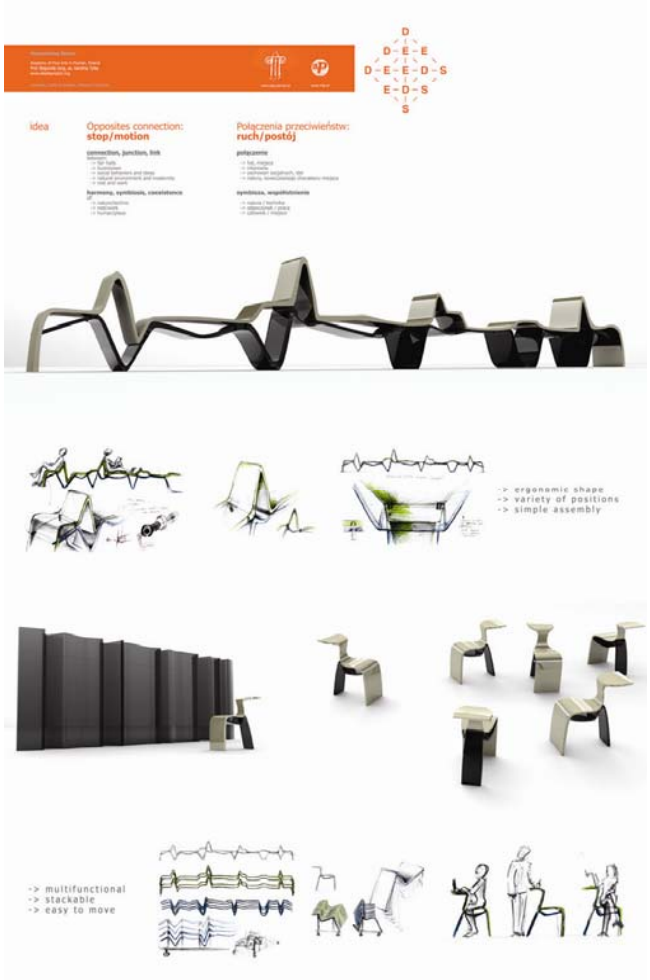


Fig. 2a: Humanising space: Design concepts generated by a co-design approach for interventions in a public space at the Poznan International Fair, Poznan, Poland

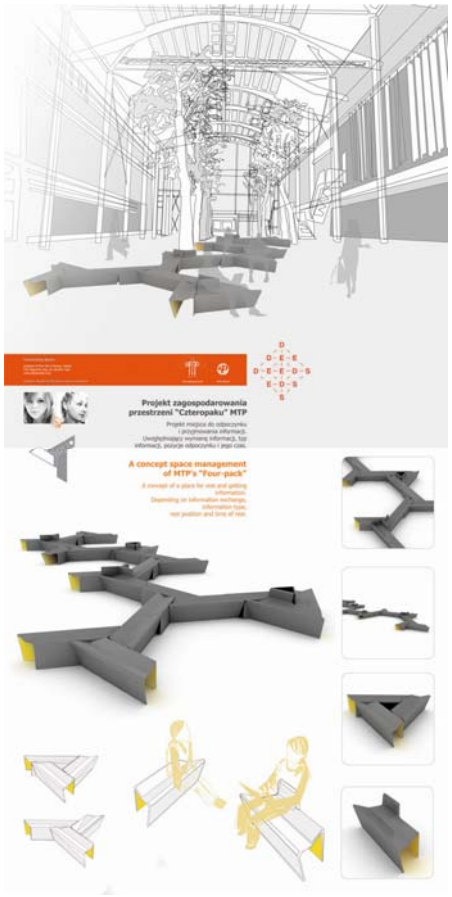


Fig. 2b: Humanising space: Design concepts generated by a co-design approach for interventions in a public space at the Poznan International Fair, Poznan, Poland

APPENDIX 1 BEDA questionnaire on behalf of DEEDS. – May 2007

DEEDS – A European project to create tools and processes for the development of more sustainable design practice across Europe. Embedding sustainability in design and design in sustainability.

We would be grateful if you could please respond to these three questions and return by Friday 18th May 2007 to: deeds@beda.org . Thank you.

Please tell us what type of designer/s you are. (graphic, product, interiors, new media, etc): _____

1/ Do what extent do you think design can have an impact on climate change issues?
Please circle the number you wish to choose

1= not at all 10 = a considerable and direct effect

1 2 3 4 5 6 7 8 9 10

Additional comment: _____

2/ To what extent, as a practising designer, do you feel you have the necessary tools and processes to support the implementation of sustainable design practices?
Please circle the number you wish to choose

1= I/we have no tools and processes 10 = I/we have tried and tested tools and processes

1 2 3 4 5 6 7 8 9 10

Additional comment: _____

3/ As a professional designer, what do you believe are the greatest barriers to practising sustainable design?
Please rate the following on a score between 1 – 10 where 1 = not a barrier and 10 = a significant barrier.

Lack of knowledge of designers 1 2 3 4 5 6 7 8 9 10

Lack of knowledge of clients	1	2	3	4	5	6	7	8	9	10
Lack of training in design school	1	2	3	4	5	6	7	8	9	10

Other barriers _____

Additional comment: _____

APPENDIX 2 Countries from which responses were received to the BEDA sustainability questionnaire

Belgium
Denmark
Estonia
Finland
France
Germany
Italy
Luxembourg
Netherlands
Poland
Slovenia
Spain
Sweden
UK

APPENDIX 3 Breakdown of responses to BEDA questionnaire by (respondents' self-declared) design discipline

Design Discipline	**Respondents**	**Percentage**
Mixed (multi-discipline)	111	39.22%
Product and Industrial (including packaging & furniture)	80	28.27%
Graphic & Communication (including new media & typography)	67	23.68%
Interior	19	6.71
Architect	2	0.71%
Environment & Eco-design	2	0.71%
Fashion	1	0.35%
Design Buyer	1	0.35%
Totals	**283**	**100**

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Less Is More: What Design Against Crime Can Contribute To Sustainability

Professor Lorraine Gamman[1] and Adam Thorpe[2]

Abstract

Crime is a voracious form of premature obsolescence. Replacement of insured stolen items increases levels of product consumption that are unsustainable. Additional to the ecological cost of crime are the social and economic impacts linked to 'courts, cops and corrections' – money better spent on building social innovation and sustainability. The user/ abuser centered methodology of the Design Against Crime Research Centre (DACRC) at University of Arts London as a socially responsive design movement is described in this paper. It argues that DACRC's approach is unique. It addresses social agendas by accommodating consideration of multiple, often competing, user-demands in a given context, and responding in ways that produce both fiscal and social capital through sustainable design.

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1. Introduction

This paper argues that design against crime constitutes sustainable design because it attempts to anticipate and design out crime and other problems from the system in the first place, in a sustainable way, rather than solving them after they have arisen, often linked to inconsiderate design. It is written in seven sections that attempt to argue with Paul Cozens that "the ubiquitous issue of crime and the fear of crime are included within some sustainability frameworks, but arguably need to be explicitly integrated" (Cozens 2007, 187-196).

2. Crime And Sustainability: Why Crime Is A Barrier To Sustainable Development

A widely accepted international definition of sustainable development is "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (Sustainable Development Commission 2008). Crime, clearly contradicts these objectives, and as the UN and most domestic governments acknowledge, is a barrier to sustainable development.

To understand why crime is a barrier to sustainable development, and how it connects to design approaches, it is important to understand its impact at both the macro and micro levels. There are four levels of impact that should be briefly reviewed here including (i) economic (ii) environmental (iii) emotional and (iv) ecological influences.

i. Economic impact of crime

The total burden of costs of crime against individuals and households in England and Wales was estimated by the British Home Office in 2003-4 (the most up to date figures we could find on record) to be around £36.2bn (Home Office 2005). This economic cost estimate is primarily linked to actual crimes measured in the annual British Crime Survey (BCS), rather than those recorded by the British police. This fact is important because, as the report explains: "cost components are effectively weighted by the probability that they will be incurred, which in turn depends on the probability that an offence is reported, recorded, investigated and so on." (p5).

The method by which these costs are calculated are complex and difficult to summarise here. Various metrologies, necessarily speculative in their scope, were used to assess the overall figure of 32.6bn linked to likely costs of crime in England and Wales in 2003-4. To arrive at this figure, the typical costs of crime types covered in the survey were calculated and combined. The elements contributing to the cost of a typical robbery of an individual are reproduced in Fig. 1 below:

See Fig. 1.

In showing the above table that identifies the costs of an individual incident of robbery (including that of services provided by the health service and criminal justice system) we seek to show the extent to which economic impact of crime is not just experienced by victims, but also by

wider society through consumption of public funds. We argue that such costs, in the long term, are not sustainable. Anticipating and designing out crime - using toughened beer glasses, for example, to reduce the effects of wounding in a bar room brawl - can reduce costs of violent assault to the tax payer and the state, as well as the number of victims of serious wounding. Our perspective on the cost of crime is (a) costs are calculated in terms of negative impact and do not include hidden costs of reduced positive impact that may have resulted from the individuals involved in the crime not becoming so i.e. they do not include estimates of the economic or social benefits denied society as a result of the subsequent actions of the victimized or criminalized. However, it is beyond the scope of this paper, and our subject expertise, to formally take issue with the way the economic costs of crime are calculated, but, and more crucially (b) we passionately believe that monies currently spent on policing crime and dealing with its consequences could be better invested developing capacity to successfully design 'out' or 'against' a significant proportion of crimes that occur i.e. prevention rather than cure linked to designing out opportunities for crime.

ii. Environmental impact of crime

The impact of 'fear of crime' by individuals whose response is disproportionate compared with *danger* or the probability of them actually being a victim of crime (Wikipedia 2008a), can also have a negative impact on our individuals and communities. In particular, fear of crime can produce vulnerability-led design responses that operate to negatively influence and determine the aesthetics of the environments we live in, as well as interaction with such environments, by individuals and communities.

Bill Durodie has discussed the "widespread presumption of human vulnerability that influences our discussion of disasters well before they have occurred" (Durodie 2004, 19) and speculates about the negative impact the accentuated focus on vulnerability leads to. Similarly we argue that security-led design responses that display an overt focus on crime and vulnerability can have a negative influence on the built environment and enjoyment of the public realm. One approach to address crimes that make people feel vulnerable has been to keep environments clean and friendly; to tidy up evidence of vandalism or civil disobedience and avoid what has been called the "broken window syndrome" i.e. "One un-repaired window is a signal that no one cares, so breaking more windows costs nothing... Untended property becomes fair game for people out for fun or plunder" (Wilson and Kelling 1982). This can be simplified as bad leads to worse. Similarly we argue that 'bad' design against crime, design that promotes an overt address to security over other considerations leads to fear of crime. Insensitivie fortification of the environment, often from outside, against attack – locks and bolts, fences and gates, cameras and flood lights – exemplify this approach. Whilst we believe security is an appropriate design consideration in certain contexts within society, there is a lot to be said for 'stealth design' responses in which security is provided covertly by 'the invisible hand of the designer' within the objects and environments they design. In short, security issues should be addressed within certain design briefs and responses but should not define them. We believe design briefs and responses for objects, services or spaces should always be developed according to their context, understanding and prioritizing the needs and aims of those that experience them and commission them. Security-led design briefs and response, tend to ignore the importance of users, and instead view the design process as if blocking the abuser's intentions was the primarily goal, more significant than the requirements of others that experience or use such designs. Consequently, vulnerability-led design responses assume a high level of fortification regarding objects, services or spaces. The semiotics of this protection is often over-determined, and contributes to paranoid 'fortress aesthetics that are disproportionate to risk and of detriment to human well-being.

iii. Ecological impact of crime against 'hot' products

Crime trends often follow consumer trends. Those products that are seen as most desirable and 'hot' are often those that are stolen most regularly according to the British Design Council (Design Council 2008).

Recent reports indicate that a third of mobile phone theft is England is linked to theft from children under 18 years of age, who simply replace their phones lost to theft, which may have been stolen but are often also linked to incidents of bullying rather than straightforward robbery incidents (Higgins 2006). Often replacement is with another or newer mobile phone model. Indeed, most individuals who have insurance cover usually replace items stolen – laptops, iPods, games consoles, bikes, mobile phones - with more up to date models. Crime is consequently a voracious promoter of premature obsolescence. It could be argued that the failure of designers to consider, and seek to mitigate, the criminogenic nature of these products is another voracious form of planned obsolescence. Anti theft functionality integrated into objects and buildings, without hindrance to the user, helps not just to design against crime, but also to protect the longevity of object use. Such an approach therefore is compatible, to some extent, with idea that both objects buildings and cities, in designing against crime, constitute more sustainable design (Knights, Pascoe and Henchley 2003).

iv. Emotional impact of crime

We have proposed above that the design of objects, services and environments have an emotional impact on those that experience them. Whilst Situational Crime Prevention (SCP), and the case studies presented by scholars such as Ronald Clarke (Clarke 1992) and Marcus Felson (Felson 2002) have persuasively made the case that environmental manipulation can help design out crime by affecting behaviour, the account of impact of the environment on well-being is also linked to other evidence based research disciplines, not just those from criminology. To give just 2 examples from health care and economics. Roger Ulrich, currently Professor of Architecture at Texas A&M University, has delivered research that demonstrates that hospital patients recovered faster (and their medication demands were lower) when the hospital environment was designed to afford them views of the natural world outside and enjoyment of natural light, compared to those that were afforded no such considerations. Ulrich and his associates also researched the influences of aural surroundings on recovery outcomes in intensive care patients, including how unwanted noise can impact negatively on staff and patients, in order to make the case for the impact of design on well being (Ulrich and Simons 1986). Richard Layard, Professor of Economics at the London School of Economics, comes from a completely different perspective when he argues that negative perceptions of community safety militate against personal happiness. He suggests (Layard 2005) that despite increased prosperity and better material conditions for the majority, British people are no happier now than 50 years ago. Layard discusses many issues relating to why this might be so before observing that post industrial countries with the highest productivity and prosperity are not always the happiest. He goes on to suggest that fear and poor perceptions of community safety may significantly detract from personal happiness (although he does not fully develop this line of argument or test it in the evidence based way Felson's, Clarke's and Ulrich's research has done so).

In drawing attention to such research we are saying that environments can operate to design out crime, but if designers are not careful the visual impact of security design (linked to fear of crime and over fortification) can lead to stress and negative emotions. More significantly we suggest that community cohesion and the forming of meaningful social bonds (that produce social capital as well as fiscal capital) are not facilitated by criminal environments, which militate against trust, cooperation and the creation of community. Moreover, that crime inhibits sustainable development because individuals need to feel **safe,** both personally and publicly, in order to be able to participate in the creation of sustainable communities.

Whilst it is true that not all products that exhibit anti crime functionality (cars for example) have made the best use of resources or materials in relation to ecological impact, in terms of the ***intensity of change*** it brings, DAC is nevertheless compatible with the aims of sustainable design. This paper will go on to argue that models of design that anticipate and attempt to design out crime problems from an environment, system or product life cycle, rather than solve them post design implementation, will be more sustainable in terms of human and economic resources than those that don't.

3. Design Against Crime As Socially Responsive Design

Design Against Crime (DACRC) at CSM is a socially responsive, practice-led research initiative, which uses the processes and products of design to reduce all kinds of crime and promote community safety whilst improving quality-of-life (see www.designagainstcrime.com and www.bikeoff.org). It aims to strategically use design to maximize impact of resources in meeting current and future human needs. This requires tackling design in relation to contexts that offer competing ethical demands, negotiating 'tradeoffs' between the demands of society, the environment and the economy. In crime terms this includes the holistic consideration of the impact of products and consumer desire for objects like the mobile phone that have been linked to crime waves. DAC is linked to the theory of situational crime prevention (Clarke 1992). In a nutshell DAC philosophy suggests that crime is significantly about opportunity, and that IF we can design out opportunity for crimes to occur in the first place, we can reduce crime, and perhaps also the number of people who become criminalized. DAC is a relatively new, interdisciplinary area of enquiry developed through innovative national and international research collaborations. It has four overarching aims:

- To reduce the incidence and adverse consequences of crime through design of products, services, communications and environments that are 'fit for the purpose' and contextually appropriate in all other respects; to this end

- To equip design practitioners with the cognitive and practical tools and resources and

- To prove and promote the social and commercial benefits of designing out crime to manufacturing and service industries, as well at to local and national government, and society at large.

- To address environmental complicity with crime in the built environment to reduce crime and improve individual and community well being.

To realize these aims requires linking two worlds; helping designers to “think thief” and aiding crime prevention experts to ‘draw on design’. It also requires an understanding of multi-stakeholder needs, and ways of working with design in partnership with colleagues from local government and business, as well as the police and the communities they serve. DACRC’s approach is more common to what is traditionally called ‘service design’ i.e. “the activity of planning and organizing people, infrastructure, communication and material components of a service, in order to improve its quality, the interaction between [object or] service provider and customers and the customer's experience” (Wikipedia 2008b).

The service element of design should not be confused with ‘service industries’. DACRC takes a service approach because it views that there are more stakeholders to be considered when reviewing the design process than just the person who primarily uses/ consumes an object, system or environment, the manufacturers and designers who produce it or the client that commissions it. DACRC’s understanding of service design includes ideas about the life cycle of the implemented design, and those that experience and engage with it, lifecycle (including an understanding of user/ abuser requirements/ desires) together with an account of community/public needs and impact. Also, that innovation in design is needed not just in terms of objects and spaces created, but also in terms of the services that are needed to maintain and make sense of them.

This approach seems complicated but it isn’t really, even if it does require more design forethought or what Thackara (Thackara 2005) calls ‘design mindfulness’. For example, when our researchers and designers started to look at bike theft (see bikeoff.org) and how to design against it - because bike theft compromises the use of the cycle as a sustainable transport system - the depth of our research focus into the relationship between bikes and crime, and understanding the entire life cycle of cycling products, led to the generation of:

- Communication designs aimed at informing cyclists how thieves steal bikes with the aim of helping them defend against thieves by registering their bike, using appropriate locks and improving their locking practice.

- Design of exhibitions linked to promotion of cycling but also information about cycle theft as it impacts on bike and bike parking furniture and facility design, aimed at informing architects and designers that cycle theft needs address alongside other cycle design drivers.

- Online design resources aimed at helping practitioners involved in cycling design provision to get smart quick about crime when developing secure bikes, bike parking furniture and bike parking environments.

- Design of anti theft bikes and bike parking furniture aimed at providing DAC benchmarks to be used operationally in the prevention of cycle theft and promotion of cycling, in addition to providing exemplars to the designers and providers of cycling infrastructure.

- Multi-stakeholder (including cyclists, designers, policy makers, private and public sector providers and crime prevention professionals) generated standards used to

brief architects/designers and local authorities about how to provide secure bike parking facilities.

The multi-stakeholder focus described above is applied to all aspects of our design research and iterated within our design process in order to ensure the relevance, efficacy and uptake of our design outputs in the public domain.

4. DACRC Iterative Design Model And The Methodology

The diagram below created in 2007 (itself the result of an iterative process of post rationalization, reflection and consultation on DACRC projects since 1999) helps visualize the iterative process of the DACRC approach to project delivery and management. Our practice-led research process has 2 strands as follows:

See Fig. 2.

The red circles show the research methodology that DACRC starts with is similar to the 'user' focus of interaction design, associated with design consultancies such as IDEO (Myerson 2001) who also fully research user needs. The main difference compared to IDEO is that DACRC reviews material linked to *abuse* and *misuse* as well as *use* in design terms. It also extends the notion of 'user' to include the multiple stakeholders listed above. Competing stakeholder aims are inevitable and are addressed through an iterative review, by a panel of colleagues that reflect the stakeholders involved, who comment on the work. These discussions are led by the researchers and designers, who used user feedback to review the necessary 'tradeoffs' between conflicting requirements according to priorities of the context being designed for.

In the nine years since our work started in 1999, our model has significantly been extended through engagement with practice and interaction with our stakeholders to address 'mis-use' as well as 'abuse' in terms of the 'ethnographic' review of factors to be drawn upon in the design process (Barab et al. 2004). In order to move beyond experiential data and interviews with users/abusers at the research stages, DACRC coalesces the conceptual frameworks, methodologies and practices of situational crime prevention, social anthropology, and psychology, among disciplines drawn upon, to offer an interdisciplinary account.

Scoping

This is the crucial stage of projects. Many forms of empirical research, as well as user data (and theory) inform the scoping stages in order to reach understanding of what crime problems or questions can best be addressed by design (rather than social policy). Also it is often the case that the researchers may bring their personal experiences of crime to bear on the scoping phase.

Research

The difference between the practice-led approach to the design process employed by DACRC at CSM and the interaction design focus and methodology that is traditionally drawn upon, is that DACRC starts with a crime problem and researches how best to address it in broad and multidisciplinary ways. It draws on anti crime thinking, in order to adapt the user centered interaction design model to address issues raised by crime. In order to bring some rigour into design thinking and the critical process of decision making in relation to 'troublesome tradeoffs', Paul Ekblom has created a series of questions and prompts in his model of the Conjunction of Criminal Opportunity: A Tool for Joined Up Thinking… (Ekblom 2000) hereinafter called CCO. DACRC at CSM suggests CCO should be applied by designers to ensure that their address and subsequent visualization of the crime and design problem is comprehensive, systematic and well grounded in theory. CCO allows designers to fully understand the problem BEFORE and DURING the generation, selection and refinement of design concepts and solutions aimed at solving the crime problem.

Observe

One of the reasons DACRC has been able to keep staff passionately engaged with the projects we deliver is that it is important to us that our own experience is included at the scoping stage (the idea that the personal is political) and during further observations we make. For example, we as staff have often been victims to the crimes we are trying to design against and we draw on this experience in addition to that of stakeholders. We also draw upon many levels of observation in our consideration of how best to respond in design terms. We also encourage observation in the field, watching how people use objects/ spaces that may eventually generate theft. We do our best to understand theft perpetrator techniques (MO's) in order to design against them.

Visualize

Visualization of these observations are central to the approach and any address to crime through the design process. Visualization aids both individual understanding and group consultation.

When thinking about design against bag theft and pickpockets, for example, the following, MOs well as many other levels of empirical research linked to bag use are researched, observed and visualized by the team. Visualizations are shown to experts, and all comments and fed back to researchers and designers to help us focus on how to best respond to design briefs.

See Fig. 3.

Generation of Prototypes/ Critique

DACRC adopts an iterative and emergent approach to both research and the generation of prototypes and usually appoints stakeholders in advisory groups and expert review panels to help critique both research stages as well as design concept and prototype stages of development. Consequently, DACRC develops hybrid approaches to the quantitative and qualitative specification and evaluation of data to be drawn upon by designers as well as products,

services and environments they produce to maximize the efficacy, relevance and adoption of the proposed solutions.

In this way DACRC delivers an iterative design process, one that has been adapted to include stakeholders such as crime prevention advisors, who have strategic knowledge of the criminal approach to objects, as well as stakeholders from business and local government who experience crime or who have reason and specialist experience about why there is a need to design against it. Like all approaches to design that contain some aspect of ‘forecasting’ DACRC advisors and designers engage, as Ekblom has pointed out, with “practical considerations in handling the uncertainty which by definition surrounds the estimated risk. It is pretty likely that on average, some broad types of product will be riskier than others.” (Ekblom 2005). This strategic stakeholder ‘consultation’ process, that occurs at stages during the development of design resource and design response iterations can help manage such risks and also identify multiple drivers that need to be addressed in order to really solve the crime problem whilst being attentive to other user considerations where desirable and possible.

The grey circles on the diagram (Fig. 2) show how the process is repeated by individual designers in the creation of specific design exemplars for specific contexts. This process eventually leads to prototype creation of a product, system or service. The designer will anticipate the interaction of many types of users (including victims) as well as abusers and mis-users (criminal perpetrator data) connected with the object, system or service, before showing it to the advisory panel for feedback and refinement (or dismissal!) of these ideas. Typically, several prototypes are generated and amended before the final iteration is agreed upon. Design prototyping is of course constrained by project resources and time constraints. What is seen as the ‘best’ or ‘final’ prototype may be linked to funding break points i.e. what can be delivered on budget available. The ‘final’ design prototypes created will aim to get the balance right between ensuring that user flexibility and desire for the output is not compromised by addressing security through modifications to enhance crime resistance. Where possible, once the product is created we will seek to test and observe the product in situ to ensure its efficacy prior to final production prototyping. Whether the design goes into production will also depend on other commercial constraints linked to materials and manufacturing needs that the designer should have addressed as part of the iterative process as well as the economic performance of the business in question. To some extent, the DACRC model moves beyond a functionalist rationale – problem solving is not the only aim of the design process, which seeks to deliver sustainable anti crime design. DACRC also tries to find a pleasing and creative ‘resolution’ for design (rather than compromise) in terms of the way security and criminal behaviour is addressed by the object, service or system, in order to aid adoption by a wide audience. Some testing is necessitated by the process, and it is here that research funding is crucial, as testing of objects for public spaces, in particular, is very expensive and needs to be undertaken to exacting standards with an interdisciplinary team (we often work in partnership with the Jill Dando Institute of Crime Science (JDI) to ensure that anti crime functionality is effective). Again, modification of a small batch of prototypes may be undertaken, before mass production and roll out of an appropriate solution.

5. Reviewing DACRC’s Philosophy And Methodology

Central to the DACRC philosophy is the opinion that design should be linked to the promotion of well being, particularly design that is located or experienced in public space. We believe it is possible to address security issues without compromising functionality and aesthetics (i.e. the simple idea that "secure design doesn't have to look criminal or ugly”) or other forms of performance, nor being oblivious to other ethical design drivers. Our research projects attempt to "... help designers keep up with the adaptive criminal in a changing world" (Ekblom 2000). This generative design research approach has led to much product innovation, discussed in Design

Appendix 1, also to over 15 international design exhibitions DACRC/ Bikeoff has curated and delivered (see www.designagainstcrime.com) in addition to inclusion of our work in many museum shows including *Safe– Design Takes on Risk* exhibition curated by Paola Antonelli (Antonelli 2005) for the Museum of Modern Art, New York.

DACRC's methodology, holistic approach and progressive social aims, have much in common with the 'transformation design' approach delivered by Hilary Cottam and the design agency Red, and more recently Participle. When interviewed about this approach in October 2007, Cottam argued transformation design is "a hybrid approach which combines people-centered methodology with systemic policy thinking". She said: "We start from the individual, unlocking a unique set of insights and motivations, which we then apply to the broad systemic problems we are seeking to answer. Our hybrid approach also means we test and scale in a different way. We rapidly apply our thinking and insights to the development of 'prototypes'. Prototypes differ from pilots: they involve early service models developed in situ, which are then tested and improved in rapid cycles, again in situ. This approach reduces risk and tends to result in new services that work and can be scaled as well as important new policy insights. Our hybrid approach and our person-centered starting point enables us to work beyond existing service silos, efficiently harnessing a broader set of resources contributing to the development of affordable whole system solutions" (Experientia blog, comment posted 20th October 2007).

Also DAC has much in common with the emergent approach described by Barab et al (Barab et al. 2004) who state that:

"As designers with a change agenda…our agenda is always evolving and mutable. In fact, in our work, we have abandoned perspectives and goals that were at one point central to our agenda in favour of new goals and commitments that revealed themselves as more applicable, meaningful, and useful over time."

The negative aspect of the DACRC methodology, which has much in common with both progressive accounts described above should also be reviewed. The DACRC iterative approach can significantly add time and cost of product development to the design account, and may be viewed by business as problematic, because of its insistence on a holistic focus. DACRC do not apologise for this approach as we are research based and research led designers, and in our opinion real innovation is linked to the full exploration (and exploitation) of so-called design problems. A further common criticism of the iterative consultative process and the DACRC approach that should also be understood by the design community is that some designers object to the 'design by committee' approach, which they see as implicit to the iterative process, and expert or multi-stakeholder review process. Indeed, some designers argue that this collective approach limits their creativity. We think this type of feedback is out of step with today's climate and linked to very old-fashioned design thinking. Designers, in our opinion will always be central to the design process, as their visual skills and abilities are much needed (and not everyone can draw or visualize well) but increasingly, across the industry, there is recognition of the value multiple stakeholders bring to understanding of a design's lifecycle and also what they can bring to design innovation, as Charlie Leadbeater has been at pains to point out in his recent account social innovation as the 'We think' approach (Leadbeater 2008). The DACRC recognize with John Thackara that "Complex systems are shaped by all the people who use them, and in this new era of collaborative innovation, designers are having to evolve from [solely] being the individual authors of objects or buildings, to [acknowledge their role as] being the facilitators of change among large groups of people." (Thackara 2005). Additionally, the DACRC iterative process also focuses on post consumption activities linked to designed objects, systems or services, which DACRC also often seek to test and review once they are actually out there – in the market or on the street – to monitor and evidence the change!

We find DACRC projects are rarely ‘finished’, but always in the stage of ‘becoming’ something else, moving on to the next phase. This is because the behaviour of adaptive criminals, competitive rivals and changing social and market requirements (and the evolution of our own insights and understandings) means that we are constantly replenishing the depth of our research focus and developing ideas about how best to design out crime and make the world a better place.

To truly develop DACRC outputs (see Design Appendix 1) we feel we absolutely need to have a relationship with the public sector, and to design for it, but also that we need to make interventions in consumer-led markets to gain evidence of the commercial effectiveness of DAC. Here we may aid providers, via product differentiation in saturated markets, to generated fiscal capital linked to products that just so happen to offer anti crime functionality and so have a USP that also has the potential to create social as well as fiscal capital. Indeed, it is precisely DACRC’s potential for generating ‘innovation’ in terms of the marketplace, that may mean it does not simply equate with purist definitions of socially responsible design, the sort originally associated with the account of those such as Victor Papanek (Papanek 1971). We think, like Nicola Morelli (Morelli 2007) that "the time has come to review Papanek’s recommendations from a new perspective, which reduces the distance between market-based and socially oriented initiatives".

At least 6 years ago, with delivery of the Karrysafe range, DACRC decided to abandon Papanek’s socially respon**sible** account of design for the real world and use the phrase “socially respon**sive** design” to describe our practice-led design model and outputs. This model is ethical in its implication, and in tune with what Thackara calls ‘design mindfulness’ because we recognize that sustainable aims must be applied in social as well as ecological terms if sustainable design is to address the needs of the real world of the 21st century.

Socially responsive design tends to start with designers individually, or as a group, trying to make their intervention through practice, but it offers a collective dimension as a model too. Ultimately, we believe DACRC’s methodology and approach to design research and the generation of products, services and environments, is important and part of the sustainable agenda, and positions DAC alongside other established thematic movements such eco-design and inclusive design.

6. Crime And Market-Led Design

DACRC is research based, but practice-led. This means disseminating design exemplars (see Design Appendix 1) is the ultimate aim of our research, and DAC thinking on this has so far worked in partnership with a market-led model of design aimed ultimately at making profit as well as generating social change. That research has ultimately led to the creation of spin-off products and companies, a phenomenon that is not uncommon in science-led industries. That these activities are designed to create positive social change is less common. Often the market rules design. For example, the pharmaceutical industry is driven by profit and the impetus for even the successful design of security into automobiles partly resulted from the British government publishing lists of the cars most frequently stolen, which shamed manufacturers into improving security and led them to compete in *market-led terms* over their reputations. Subsequently anti-theft designs based on electronically coded ignition keys and immobilizers were made mandatory by EU directive, but were also seen as part of necessary marketing of brands to sell automobiles. DACRC is not market-driven in this simple way. The problems we seek to research and respond to with design, are not market-led but can be positioned to be compatible with some market forces, even if the drive to design out premature obsolescence from products like mobile phones

or iPods means that we are trying to inhibit manufacturers making money from crime in negative ways i.e. we think phone companies regarding theft of mobiles should make profits from anti-theft design not from insurance upgrade linked to stolen mobiles.

Criminogenic designs (those that cause crime) often do so because they are easy to steal as well as being attractive. Criminologists identify a cluster of risk factors, for theft in particular, known as CRAVED - objects that are Concealable, Removable, Available, Enjoyable and Desirable (Clarke 1999). These factors could equally be read as a list of desirable features for mobile products which highlights the need for consideration of 'troublesome tradeoffs'. We do not seek to be against making things desirable (i.e. to always prefix this list of CRAVED characteristics with 'Un-') but rather wish to limit their impact in criminogenic terms – through design.

Of course, it is dumb to 'blame' crime on designers when the culture of consumption where 'having' (things) is more important than 'being' (a decent person) generates greed and obsolescence. But, as John Thackara points out some "of the troubling situations in our world ARE the result of … too many bad design decisions" (Thackara 2005), and so DACRC, as advocates of a pragmatic change movement, starts from the premise that something needs to be done now in order to address poor design decisions and to correct them where possible. Mindful of the idea that manufacturers often have more final choice over final design decisions than the humble designer and also of Papanek's belief that "design has become the most powerful tool with which man shapes his tools and environments (and, by extension, society and himself)." (Papanek 1971).

7. Conclusion

We conclude by arguing the DACRC research model is compatible with the aims of sustainable development. We target crime problems that stand as a barrier to the progress of social and ethical agendas. Our current focus on bag theft (mobile property theft) that detracts from the enjoyment of public spaces and public transport, and bike theft that detracts from cycle use, continue to be on-going areas of enquiry. In future we also plan to expand the design territories our Centre is able to address as socially responsive design "which takes as its primary driver *social issues*, its main consideration *social impact*, and its main objective *social change*." (Gamman and Thorpe 2006).

In describing the socially responsive methods and objects generated by the DACRC and its Bikeoff initiative, this paper has sought to offer a definition and illustration of socially responsive design, that is both design-led, and interventionist in its approach. One that is hopeful that objects, spaces and services and the material culture they produce, can help change consciousness and society for the better. We have also outlined some of the ways that design can address and drive social issues linked to the desire to bring about positive social change. Additionally, one of the academic objectives of this article has been to demonstrate that DACRC offers a sustainable design model. We hope in describing our own practice and how we have attempted to *slow down* crime by promoting secure design (prevention over cure) we have made a strong case as to why DAC constitutes integration into broad and holistic accounts of socially responsive and sustainable design. DAC seeks to secure and sustain a future where responses to negative risks like crime are proportionate to real danger (rather than fears) and are integrated, (by design) within models that seek pragmatic improvement in social prosperity as well as the quality of life for individuals and communities.

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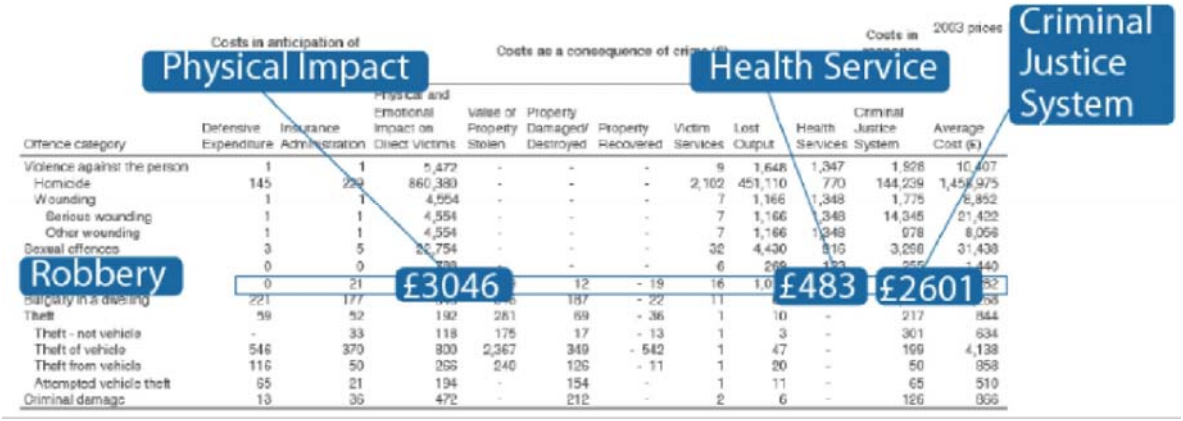


Offence category	Defensive Expenditure	Insurance Administration	Physical and Emotional Impact on Direct Victims	Value of Property Stolen	Property Damaged/ Destroyed	Property Recovered	Victim Services	Lost Output	Health Services	Criminal Justice System	Average Cost (£)
Violence against the person	1	1	5,472	-	-	-	9	1,648	1,347	1,928	10,407
Homicide	145	222	860,380	-	-	-	2,102	451,110	770	144,239	1,458,975
Wounding	1	1	4,554	-	-	-	7	1,166	1,348	1,775	8,852
Serious wounding	1	1	4,554	-	-	-	7	1,166	1,348	14,345	21,422
Other wounding	1	1	4,554	-	-	-	7	1,166	1,348	978	8,056
Sexual offences	3	5	35,754	-	-	-	32	4,430	816	3,256	31,438
	0	0	739	-	-	-	6	269	133	255	1,440
	0	21	3046	-	12	- 19	16	1,0	483	2601	82
	221	177			187	- 22	11				
Theft	59	52	192	261	69	- 36	1	10	-	217	844
Theft - not vehicle	-	33	118	175	17	- 13	1	3	-	301	634
Theft of vehicle	546	370	800	2,367	349	- 542	1	47	-	199	4,138
Theft from vehicle	116	50	266	240	126	- 11	1	20	-	50	958
Attempted vehicle theft	65	21	194	-	154	-	1	11	-	65	510
Criminal damage	13	36	472	-	212	-	2	6	-	126	866

Fig. 1: Estimated average costs of crime against individuals and households in 2003/4 by crime type and by cost category

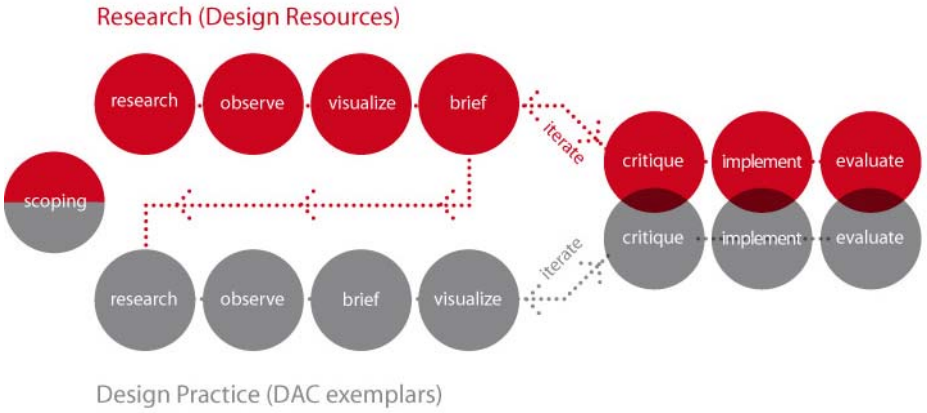


Fig. 2: DACRC Iterative Design Model

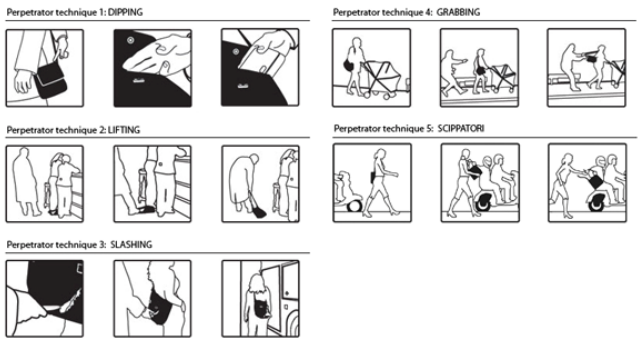


Fig. 3: Perpetrator techniques

Design Appendix 1: DACRC Design Innovation

1. Why Design Against Cycle Theft?

Cycling helps fight obesity, is good for our hearts as well as offering an important sustainable transport system as an alternative to the gas-guzzling car for urban mobility. No wonder our London Mayors - past and present - with the help of TfL encourage Londoners to cycle more.

Yet Transport Research Laboratory's research shows that 17% of all people that cycle have their bikes stolen – and of this group 24% stop cycling altogether and 66% cycle less often. Worse, our own Bikeoff.org research shows that after making 8,500 observations of cyclists parking on the streets outside our own College that many people are complicit with theft, as they do not appear to know how to lock their bikes securely, making life too easy for thieves. So we felt something needed to be done about cycle theft. Our top 4 anti cycle theft designs – that help block some of the common ways thieves steal bikes - include:

CaMden Stand (M Stand)

The caMden (M) stand was developed to covertly persuade the cyclist to lock low – securing frame, wheel to the stand – because the less secure 'wheel only' or frame only' locking options require more effort to achieve with this design. Unlike the ubiquitous Sheffield (U) stand that tends to inspire people to lock through the top of the frame (making it easy for thieves to steal bikes) the M encourages cyclists to lock their bike in a more secure way. We decided to call this stand the caMden (M) stand because this borough, in partnership with TfL, wanted to be the first to help us design out crime in London and have already installed over 100 stands on their streets. The success of this design has encouraged Brighton and Hove to install and test the design as part of their anti bike theft initiative which we are helping them deliver linked to their Cycle Demonstration Town status.

Front Wheel Enclosure

The front wheel enclosure performs in a similar way to the M-stand whilst also having a sculptural quality – lacking in much street furniture - that in my opinion would not look out of place outside the Tate Modern. For years DAC's shout line has been "secure design doesn't have to look criminal" – this product delivered partly by designers from Vexed Generation (who often work with DAC) illustrates that fact. The best ways to lock up a bike – particularly in cities where bike theft is part of daily life - is not just to "lock both wheels and the frame stand" but also to use 2 different types of lock (as shown here) so the thief is forced to use more than one type of tool if they try to steal your bike.

Our Bikeoff team – led by senior designer Adam Thorpe – designed both stands and the Jill Dando Institute (JDI) of Crime Science, who evaluated our designs, delivered research that shows that the stands do in fact improve the security of cyclists' locking practice. So we have some proof that our designs work in practice - not just in theory - and the stands are now available from Broxap, Britain's biggest cycle furniture manufacturer (www.broxap.com).

Puma Bike

The Puma Bike applies a classic DAC strategy – 'spoiling' – to deter bike theft. The wire cable is a structural part of the bike frame as well as being a 'built in' lock that can secure the bike and its wheels to parking stands or other stationary objects. The idea is simple – if you cut the lock you break the bike – making it less viable or valuable for re-use or resale. But it is not just the anti-theft functionality that is strong is this design, is the way it is delivered. This address to DAC is what led to this bikes most original and distinguishing feature. It's a great example of how the 'different question' of "how to avoid theft" led to the different answer of "integrated cable lock"

that makes this bike so unique, and a USP in the market place. It's great to see DAC contributing to innovation in the 'sports lifestyle' market! See http://www.coolhunting.com/archives/2005/03/first_glimpse_t.php.

'Lock Both Wheels And The Frame To The Stand' Sticker

This simple sticker is important because works to improve cyclist-locking behaviour, as JDI evaluation of it on U stands shows. It offers I economy in design– the idea that you should seek to get as much performance from as little design as possible. These stickers were proposed as a way to improve locking practices of cyclists and thus reduce theft of parked bikes. The graphics and colours are chosen to lend an air of civic identity and familiarity – the graphics are simple and easy to understand even without being able to read the concise messaging that accompanies it. The idea of using small stickers on the bike stands rather than signs in the street surrounding them that deliver more visual clutter is important. It offers as a way of 'talking' to cyclists about how to lock their bikes rather than 'shouting' above the cacophony of other graphics competing for our attentions on our cluttered high streets. This sticker was tested in London and Brighton – again with JDI evaluating the results – and it was found to produce a 10% increase in secure locking practices – small but significant. We have licensed this design to a number of local authorities and are now in discussion as how best to roll these stickers out across London and beyond! See www.bikeoff.org.

2. Designs Against Bag Theft

The British Crime surveys shows that in Britain a bag or mobile phone is stolen every minute. It is annoying to lose all our favourite things – money, mobiles, iPods and more – to sneak thieves. But even more overwhelming than the personal cost of such losses is the extra punishment of time spent canceling credit cards and re-cutting keys. So our Design Against Crime (DAC) Research Centre wanted to do something about pick-pocketing and bag theft, as annoying crimes against the person. Our 3 best designs include:

Design Against Crime Chair

(available winter 2008 from Danish furniture supplier Dan-Form (www.dan-form.dk)

This DAC chair (1) looks lovely as design - no big locks or bars needed your bag safe from thieves and the floor tidy (2). It utilizes the defensible space of the body (the bag-holding slot is located near the genital region) to enable the individual to sit pretty secure on their belongings with the understanding that their unconscious is very awake to infringements in this region! (3) Designers Jackie Piper and Marcus Willcocks helped Lorraine Gamman deliver this design to Dan-form, who have licensed it recently. It will be on market from Winter 2008. We recognize that pickpocket/bag theft problems are not just about poor bag design but also about the furniture we respond to locate in public space. If you leave your bag on the floor or on the chair next to you – you make it too easy for thieves to simply slip away with it. So best to remove opportunities by sitting on your assets, preferable on a DAC chair.

Karrysafe Scroll-Top Backpack

(www.fonehouse.co.uk/feelgood/karrysafe)

Rural backpacks for hiking were re appropriated for urban environments as city bags. What idiot designer first put an insecure bag opening on our urban backpacks away from our natural sightline is unknown to DAC, but he/ she seems to have inspired a million other idiot designers to come up with the same concept, and the rest of us to buy them.

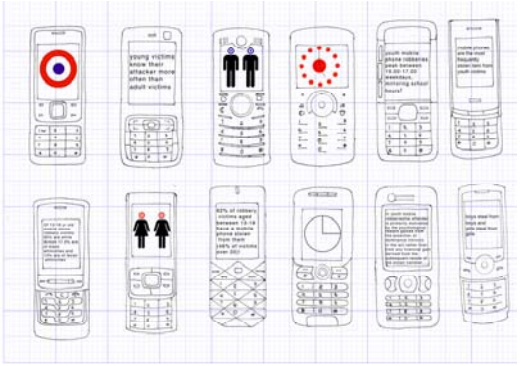
The Karrysafe backpack, delivered for DAC by designers who were commission from Vexed Generation, offers anti crime functionality by (1) putting a simple combination lock on the bag of the bag so no one can get into it when the owner is not looking. (2) It also includes a side lanyard so users can secure their bag a train (Eurostar/) seat or the pub table when they need to go to the toilet/bar without having taking ALL their belongings with them. It also leaves you users

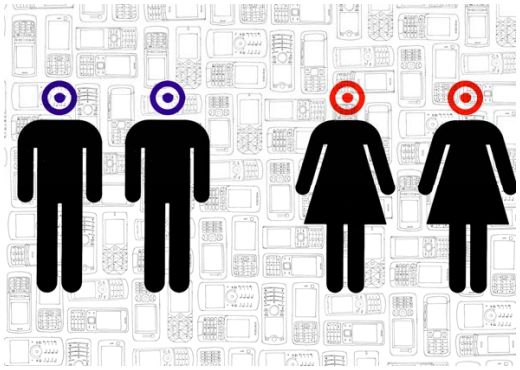
safe in the knowledge that no one can open their bag or remove it from the seat/table before they get back. (3) It takes 2 hands to open it (thieves usually “dip” with one hand) and (4) it uses Cordura – which is not a designated anti-slash material – but one that makes it hard for thieves to slash bags with simple knives or blades and thus get at possessions this way. Why this design hasn’t been copied by every major bag manufacturer/designer out there DAC has no idea – we suppose it is too sensible to catch on? But DAC still think its one of our best anti theft designs on the market and is currently available at £29.99 from www.fonehouse.co.uk/feelgood/karrysafe.

Is Mobility Messy?

The DAC team is still working on a low tech anti mobile phone theft device – and we can’t mention any more about it in this article, as the design won’t be available till the end of the year. Our sponsors, the British Transport Police (BTP), have briefed us to figure out how to make commuting safer from pickpockets and we are developing a relationship with a commercial client too. BTP came to us because our exhibition Secure Design for Safer Travel - at Victoria station successfully communicated via an anti crime wave of anti theft objects - that design can make a difference… even if mobility is invariably messy.

3. Mobile Phone Theft





So we have chosen the DAC anti mobile phone theft poster that appears on our design resource www.inthebag.org.uk (which is currently open to comment from viewers to help redesign the site in a more user-friendly way). Our point in choosing an illustrative design communication, as well as objects, is to remind everything that graphic communication has a role to play in helping to make crime prevention sexy and to design out crime from the world.

Full of facts about crime against young people, the poster reminds us that it's our young that get clobbered most for their phones. (Higgins 2006). But phone theft against young people often appears to be more about bullying than it is about stealing. Even though there are organized phone thieves out there who work in gangs and ship our stolen mobiles abroad after we have been "dipped", when it comes to young people - power (bullying) as well as profit may be the primary motive as to why kids get "taxed" by other kids for their mobiles.

4. Design Against Burglary - Secured By Design Poster

Some part of London look like fortresses – such as Fortress Hackney – with its flats that feature iron bars on windows and barbed wire on supermarket. No wonder DAC feels the need to encourage more architects to think about crime BEFORE they design our buildings, hence this poster.

Retrofitted security looks criminal and worse, contributes to making people feel safe unsafe. Crime is a voracious form of planned obsolescence and a barrier to sustainable development because money spent on insurance up-grade of objects stolen through burglary fuels consuming passions. Worse, the costs of policing this sort of crime and dealing with the consequences of theft and vandalism, across the world, as we have already stated could be better spent on essential social infrastructure such as health, education, transport, and culture.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Experiential Experiment:

Is design education sustainable in a changing university environment?

Elizabeth Gaston[1] and Jane Scott[2]

Abstract

This paper aims to question conventional methods of design education in an attempt to create a sustainable design programme suitable for the needs of a 21st century design community.

Most UK design institutions are now part of the university system. This has led to a change in focus on the requirements of teachers and learners. Concurrent to this is the changing needs of the design industry that will employ design graduates.

This paper reports on research funded by The University of Leeds investigating a future strategy for sustainable teaching in design practice. To ensure that a sustainable approach to design education is attained teaching staff must be prepared to embrace change and experiment with new perspectives and new technologies.

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1. Introduction

As educators we congratulate ourselves on the success of our design programmes but how should we measure success, is it the number of students who obtain excellent marks, or the number of graduates who gain employment in relevant industry positions? A different measure of success could be consistency of design research; perhaps the most relevant measure should be the creation of designers who improve society.

2. Context

The Textile Design programme is changing. The School of Design is changing. The University of Leeds is changing. The University system is changing. Within this state of flux where macro decisions impact on the minute details of a lecture, a project, or an assignment, some sense of balance needs to be restored.

This paper argues for an innovative, sustainable approach to learning and teaching which re-imagines outdated models and methods to engage with the changing university system, providing an appropriate and diverse educational environment. The paper highlights good practice from The University of Leeds with particular reference to the Textile Design Programme, It will consider three areas that are experiencing or will experience imminent dramatic change; staff, space and skills.

3. Skills: sustainable learning

In a review of undergraduate textile design education in the UK the model of tutor led studio practice, supported by lectures and seminars predominates (Gaston 2007). The focus is heavily skills based, producing graduates who have strong specialist skills in a particular area.

Nationally, however, the profile of delivery is changing. Traditionally the unifying feature of textile design programmes was the skills based, experiential learning model. At the beginning of the twentieth century the Bauhaus model emerged in the Basic Course (Itten 1963, 7). With refinement and development of specialisms this model has endured to the beginning of the twenty-first century taking little account of the changing needs of current graduates, the design industry and society. A focus on practice based modules which has conventionally accounted for 80% of the curriculum in an art college model is slowly being eroded due to pressure on time and resources. The reduction in studio based delivery has been seen as detrimental to a student's development, particularly the development of technical and aesthetic subject-specific skills. However this trend is not going to reverse and a sustainable approach considers what the appropriate needs of graduates are within contemporary society.

The experiential model is however supported by the major stakeholders in education; students, tutors and institutions. Students demand skill specific teaching to enhance their immediate employability and staff, who themselves have followed traditional teaching methods, have bias towards their chosen field. Institutions demand leaders in their field to undertake subject specific research.

In the last thirty years the needs of the design industry has changed dramatically yet design education, although following superficial trends in out puts, has remained static. The UK design industry has grown rapidly over the past decade to become the largest in Europe with an annual turnover of £11.6 billion (Design Skills Advisory Panel 2007), however conversely there is also a perceived over supply of design graduates from a raft of similar courses who do not have "the right professional skills" for the design industry (Design Skills Advisory Panel 2007). This suggests that as educators we are failing the needs of our students.

As early as 1970 Papanek suggested that a narrow design education did not provide society with designers who were equipped for the challenges of the twenty first century (Papenek 1984, 285). He argued that society requires broad generalists who can produce integrated design solutions rather than those who re-hash and re-develop old ideas. The specialist trained students may find initial employment with ease but will be left behind in their careers by the generalists. This view was echoed by Hemmingway (Hemmingway 2007) who suggested students needed to take a broad view of education and try to avoid specialism.

3.1 New Approaches: the designer graduate

According to The Quality Assurance Association which is responsible for evaluating standards within UK Higher Education, a graduate will be able to:

- deploy techniques of enquiry
- Comment on current research
- Appreciate uncertainty, ambiguity and the limits of knowledge
- Manage their learning
- Evaluate critically
- Solve problems. (QAA 2007)

These specific qualities are expected of all UK graduates, and places design graduates in a strong position. The nature of design as a problem solving activity implicitly fulfils many of these criteria. Within a practical context students are required to question, analyse and understand a range of issues and evaluate potential outcomes. The cyclic nature of the design process which supports Kolb's Learning Cycle (Kolb 1984) provides structure to student learning creating a framework for students to test a range of ideas and intentions.

"Active learning through project based enquiry has always been a feature of the art and design curriculum in higher education. Through this approach students have been encouraged to develop both the capacity for independent learning and the ability to work with others." (QAA 2007)

Through project-based enquiry the designer graduate applies both theoretical and practical skills to a range of problems, and continually reflects and evaluates work and working processes in order to promote innovation in contemporary practice.

3.2 New Approaches: the research practitioner

The University of Leeds is ambitious in its goals; within the University's strategy map the key theme for learning and teaching is to "translate excellence in research and scholarship into learning opportunities for students" (University of Leeds, 2008). Research underpins all teaching programmes within the university and supports teaching though engagement with case studies, live projects, and relevant industry based applications. An understanding of process and method is emphasised as key learning outcomes for students at undergraduate and post graduate level.

This provides an exciting environment for learning and teaching within The School of Design. Research within art and design is an evolving field and undergraduate programmes within The School of Design have been re-imagined to focus on internal and external research areas. The School of Design aims to provide an environment where research from a variety of disciplines including textile technology, fine art practice and fashion innovation can be integrated into undergraduate learning and teaching.

3.3 New Approaches: communities and systems

Sustainability requires a trans-disciplinary approach. If it is no longer appropriate to train students to become skills-based designers, students need to consider a range of working methodologies and succeed in applying processes and skills to a variety of natural and virtual applications. Design for the future should be community focused; group work through live projects, virtual communities and peer assessment provides the opportunity to move away from focusing on the individual to community based design where shared ideas evolve into genuine innovation. The power of networks and communities is increasing rapidly as appropriate technologies provide instant access to friends, colleagues and new contacts through social networking sites. Translated into an educational context this is already transforming the student experience at Leeds.

Research in Art and Design already considers the artifact as only one strand of practice. A focus on process and method advocated by collectives such as Fo.am considers that future working outcomes include a focus on design for experience and emotion. To translate this into undergraduate learning and teaching new methods and approaches are required. (Kuzmanovic, and Gaffney 2006). An understanding of the research practice of scientific, technological and cultural researchers is necessary for the new generation of students to fully engage with the needs of both future customers and colleagues and understand the social framework of the community.

3.4 Summary

Problem solving and critical thinking remains vital to design education. A sustainable approach suggests new contexts to work within, different tools to apply, and a shift in approach from the individual to the community. The design graduate is placed in a strong position within UK higher education, and student learning can benefit from an exciting trans-disciplinary approach practice and research.

4. Space: a sustainable studio

External and internal pressure within the university system has lead to increasing pressure on resources. The cost of studio space within design departments has increased exponentially with the growing resource issue of space charges, where departments are charged for the ground space they use. In a non practical subject one lecture theatre can house large numbers of students yet design students need studio space and access to bulky equipment which is far less economical. The inevitable outcome is of a reduction in studio space and the foreseeable end to individual workspaces within the studio environment. At Leeds 'hot desking' has formed part of the design culture for several years, and despite initial concerns from staff a new, flexible approach to space has produced surprising results.

It is not difficult to see the benefits of sharing space; positive results from Leeds include trans-disciplinary project work, a greater sense of group dynamics and wider participation across student cohorts. In addition to this individual projects have tried to respond to student concerns to the changing working environment through novel approaches to the problem.

4.1 New Approaches: redevelopment and the temporary Studio

In order to explore the function of the studio experience, a project was developed in conjunction with a Leeds based development company. The project allowed students to work and showcase work in a vacant city centre office building. Contextually this project supported Bernard Tschumi's theory of event-activated space, in which the space itself is only given meaning through the events that take place within it (Tschumi 1994, 11). The outcome of the project was the first exhibition from the 'knit-fit' collective of designers based in the School of Design.

After an initial visit to the temporary workspace in City House, work was planned and realised over a three week period. The conclusion to the project was an exhibition which opened to the public for an evening reception.

The intention of the Re-development project was to provide a new point of view for students to engage with the concepts of the studio and the city. The University is located on the margins of the city; this experience provided an opportunity for design students to respond to a different perspective of the city, from right in the heart of the commercial sector. The showcase also aimed to promote the potential of design work; not only as part of visual culture, but also as an activity to connect with the wider community and question the cultural significance of the role of design in Leeds.

Re-development as an event is significant on two distinct levels. The elevated city centre location exaggerated a new frame of reference for students to work within, drawing on a different reading of the city of Leeds both from a commercial and a centralised viewpoint. The temporary location provided an opportunity to re-locate studio practice within the vast space of a redundant office building and re-imagine constructed textile design in scale, materials and purpose.

The event raised questions about the role of the studio for design practice. Through a small scale event students were able to engage with the environment as a point of departure for and exploration of working practice. Students were asked to reflect on working practice after the project. The majority of the group agreed that the event had been successful in terms of working outside the studio environment, and that the public nature of the showcase encouraged a professional approach to work. Despite initial perceptions of the space as an 'office environment', the showcase provided a meaningful and creative intervention. The success of this small scale event supports Tschumi's concept of the event-activated environment, and suggests that a variety of locations and spaces can function as temporary transformable studios.

4.2 New Approaches: Knit-Fit and the virtual studio

The University of Leeds aims to provide a flexible, technology rich working environment. To support working practice there has been a shift in focus from communication via email to the use of social networking sites to maintain virtual group dynamics. The Knit-fit collective is an example of an online community created and developed by its members. The group encompasses all knit specialists, both students and tutors, from textiles and fashion backgrounds. Using Facebook as the host knit-fit has provided a space for discussion and engagement with knit based activity both inside and outside of the university. The site is successful when there is a clear purpose to the engagement and peer support is a key driver of this community. The tool works as a site for providing and accessing information. The success of the facility can be monitored through use; after the Re-development event photographic records were uploaded and downloaded regularly. A student visit to Pitti Filati was organised in part via the knit-fit community.

Although on-line activity will never replace face-to-face contact, this is an example of good practice where knit-fit becomes a complement to face-to-face communication in an environment where time is one of the most valuable resources.

4.3 Summary

The two research projects identify that a flexible approach to studio space is necessary. Working in different environments, both real and virtual, not only stimulates new and exciting contexts to work within but challenges the working method, encouraging an exploration of new ideas, environments and experiences design education can offer.

5. Staff: sustainable contact

The change in administration of many UK art colleges in 1992 when many obtained university status compounded the problems of a narrow curriculum. Research dependant funding has generally led to a reduction in the availability of staff teaching time.

It is clear that the traditional art college model is no longer sustainable in terms of staff time and resources. As designers we are innovative thinkers and problem solvers, we are ideally placed to redesign the future education of the next generation of design students; however it is not necessary to redesign the wheel.

5.1 New Approaches: case studies for consideration.

Design is not alone in its use of practice based teaching. At the University of Leeds the Faculty of Biological Sciences was experiencing a resource problem in the delivery of anatomy (Roberts 2007). The traditional method of learning human anatomy involves dissecting real cadavers however this is expensive and an online alternative has been developed using simple and easily accessible software. Although time consuming to set up; the resource has proved successful.

To expand the time available for teaching The School of Medicine is utilising online tutorials in medical ethics (Testa 2007). Over a period of three weeks each group of seven to ten students are required to access a virtual discussion room and respond to a set topic. Tutors commented that contributions were often more considered in the on line setting then in live tutorials and there was more participation from a greater number of students. Students appeared to be more comfortable expressing their views in this form.

A further example of expanding the curriculum has been demonstrated by the School of Earth and Environment (Reed 2007) where the use of podcasts has expanded the traditional lecture. Easily created podcasts can be used to supplement teaching materials by providing lecture summaries, pre-class information, contextual material for example speeches or interviews and multimedia materials. Student feedback has been excellent.

Problems with accessibility of tutors have been overcome at Yorkshire Coast College, Scarborough through SMS technology. Inexpensive software, txttools, links tutors to student mobile phones and laptops. Originally used for information dissemination from institution to student, the system has become two way with students asking questions by text rather than struggling to find a suitable time to talk to the tutor face to face (Hoare 2007).

5.2 New Approaches: application to design

Design courses are also utilising new technologies to over come resource problems. At Leeds College of Art and Design, practice based skills, predominantly CAD skills, are taught with a variety of additional support. Tutor demonstrations of software such as Photoshop are presented on screen interactively and are supported by a PowerPoint presentation of step by step actions. Video tutorials are created using Adobe Captivate. The tutorials promote active involvement of the student as they can be slowed down or repeated and help to reinforce the tutor demonstration. They have also been shown to promote understanding of the application of software in a textile context.

5.3: New Approaches: studio-based support

Despite the move towards a broader education it is still necessary for students to develop subject specific skills. Students are often required to operate complex, studio based equipment to facilitate the production of textile designs. Video tutorials were not felt to be useful in this context. The model of producing online video tutorials has been proved successful for CAD software (Hughes 2007). They can be accessed immediately at the point of need whilst using the CAD software. Under present University of Leeds arrangements the structured textile studios are not networked and are remote from the PC clusters and so access to tutorials would be separated geographically and in time. This was corroborated by staff at the University of Brighton who agreed that video tutorials were less useful for active use in the studio (Haffenden 2007).

Additional information was delivered to students in the form of high quality photographic images to supplement the text based information given during classes. These were stored within the subject specific rooms in the University of Leeds' virtual learning environment. The reason was two fold. Students had to be proactive in obtaining the extra information and the cost of producing large colour hand outs was prohibitive. Although "low tech" the simplicity and portability of paper handouts can add great value to the learning experience (Walker 2007).

Student feedback collected at the end of the semester indicated that this method of delivery had been successful. The extra information had been accessed by four out of five of the cohort, the majority of whom found the resource valuable. The success of delivering information visually is congruent with the preferred learning style of textile design students in which 95% of students chose visual/kinesthetic as their dominant style after taking the VARK characteristic test (Flemming1996). These types of students learn best using images, examples and activities rather than listening to a wholly aural presentation.

The same cohort were invited to test podcasts as a support to their learning, however this technology was less successful. Evidence from learning style analysis suggests that this technology would benefit aural rather than visual/kinesthetic learners, and the student group felt that the podcast format did not provide additional information beyond the initial demonstrations, highlighting that not all technologies are appropriate for all student cohorts.

5.4: Summary

As pressure on staff time increases within the university environment technology can provide flexible support for studio based learning. A range of tools currently being tested across universities provide different types of support. Online tutorials and guides provide access to information on demand in a variety of formats to suit different learning styles and working environments.

6: Conclusions and Recommendations

The University system continues to change, supporting a wider and increasingly diverse community of design students and graduates. The University of Leeds is proud to be changing. Learning and teaching is underpinned in the strategy map by research and a commitment to innovation. The Textile Design programme is already changing. The School of design has responded to market needs to create a broader design portfolio.

However a sustainable approach cannot be designed into education unless it is supported by changing attitudes and approaches. Novel solutions highlighted in this paper underline opportunities afforded by these changes, enhanced by technology and innovation. In a climate where resources are more precious than ever before, staff, space and skills, must adapt and evolve to create a sustainable environment for design education.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design for Social Innovation[1]

Enabling replication of promising initiatives for sustainable living in Brussels and Paris

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Abstract

This paper will present and compare the results of two parallel research projects focusing in design for social innovation. Teams of designers in Brussels and Paris experimented real size participative design processes with two groups of citizens willing to start or improve collaborative solutions:

- car drivers promoting local urban hitchhiking initiatives around different areas of Brussels.

- single seniors offering spare rooms through cohabitation opportunities to students in Paris;

In particular this presentation will focus on the start-up phase and the projective approach used by the designers to stimulate social conversation between players involved and support them with a tool called *enabling cards* in the discussion and construction of their customized solution.

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1. Introduction

Shared housing, alternative mobility… spontaneous social innovation may reveal new and more sustainable solutions in daily urban ways of living.

How to improve these initiatives and make them more accessible for a larger share of users keeping their initial social qualities? How to scale them up fostering their duplication at the local scale maintaining their environmental benefits? What can strategic design bring to support these social innovators? Which are the new approaches to co-design within a social fabric of creative users?

This paper will present and compare results of two parallel research projects in Brussels and Paris, focusing on design for social innovation. Teams of designers together with the École Supérieure des Arts Visuels of La Cambre in Brussels and the École Nationale Supérieure des Arts Décoratifs in Paris experimented participative design processes with groups of citizens willing to start or improve collaborative solutions. The two cases groups focused on are respectively:

- car drivers promoting local-urban hitchhiking initiatives around different areas of Brussels[6].

- single seniors offering cohabitation opportunities in their spare rooms to students in Paris[7];

In particular this paper will focus on the start-up phase catalysing new solutions and on the projective approach used by the designers to stimulate social conversation between involved players and support them in the discussion and construction of their customized solution. These collaborative design sessions with existing and future promoters allow to describe the key-characteristics and possible options of a 'meta' or 'generic solution' used during workshops or interview sessions to facilitate appropriation of complex product-service systems and to enable non-professionals to design their life's solutions.

2. Promising initiatives of social innovation

This first part will describe the different starting points of the two parallel experimentations: whether a solution was in a launching phase as for the urban hitchhiking or already implemented, as the cohabitation of seniors-students. The analysis of these solutions will focus on the different barriers to diffusion of these initiatives and possible up-scaling strategies.

VAP

Voitures à partager (VAP), born in 2005, were determined to make auto-stopping in the city easy and safe. Claire Van Bellinghen who is the project initiator, was motivated by her commune's « Mobility week » to set this urban-hitchhiking system. They considered two problem levels as challenges: some more largely shared ones like global warming -combined with transport accessibility issues; and more local ones like profiting from not fully occupied commuting cars, enhancing solidarity between pedestrians and drivers, whilst generating more social links in a commune that already has quite an open mind set.

[6] VAP, Comobil, Kotvoiturage/Taxistop and Myoto, Brussels, Belgium.

[7] Logement Intergénération, Paris and Rouen, France e Prendi uno studente a casa, Milan, Italy.

It needs little infrastructure to accomplish its objective: Users subscribe to the service - free of charge- receiving a registration number plus a variety of VAP identification elements as a car sticker, ribbon, member card, all made to be easily recognizable. The service was meant within members only: they can participate as pedestrians, as drivers or they can be listed as both.

The pedestrians then are able to hitchhike, card in hand, so VAP drivers can recognize hikers as fellow users; encouraging them to stop. The car, showing VAP ID elements, is made visibly reliable to hitchhikers; thus, through mutual recognition, the spontaneous car pool is concreted. This urban hitchhiking service is founded on reciprocal identification and trust, encouraging spontaneous social contact yet keeping a safety element in mind.

VAP is thought more as a complement to urban transport than a substitute. This system was intended to accelerate connection to bus stop's in a suburban city area, as the service's native Watermael-Boitsfort, who has only 3 bus lines for 80 km of streets. The members are currently around 720: 550 in Watermael-Boitsfort and 170 resident in other communes.

Effectively, this system has shown some specific problems: the quantity of members is still growing but critical mass has not yet been reached to produce a fluid service. Members are in disproportion between drivers and pedestrians[8]. However, work is being done to improve and develop service quality such as destination cards for hitchhikers in the form of a booklet and 3 signaled pick-up points installed in the streets of Boitsfort.

Set as a bottom-up open *collaborative service* (Jégou, Manzini, 2008), the service aspects are then reduced to registering subscriptions and sending VAP cards to each user. This activity and the promotion of it are based on the involvement of a small group of early promoters around the solution's inventor. VAP promoters also make sure at subscription level that basic security requirements exist to both driver and passenger: They verify that all members are above 18, that the driver has proper insurance, a valid driver's licence number and all members remain registered in the service's database.

None of the involved wins anything in the growing of the service except the satisfaction of less traffic and more voluntary work to be done. The municipal subsidies are covering part of the expenses (cards and leaflets printing, or the sending through post mail) implicates that the core group of promoters should grow in number to cope with multiplication of members. Therefore, to scale-up VAP means fostering the replication of the initiative, assembling or assisting other groups of motivated potential users located in other places in Brussels and its surroundings. VAP may then replicate through *dissemination, affiliation or branching (*Dees, Battle Anderson and Wei-skillern, 2004) of a series of more of less similar VAP antennas.

Contrary to the more usual design of a commercial service taking into account possible evolutions from launch through growth and maturation, enabling new VAP antennas to emerge requires extracting all the knowledge and procedures gathered by the initiative in order to make it available to new groups of potential promoters. But profiting from the accumulated experience of promoters is not enough: on the one hand, some improvement may be made questioning the current VAP setting, and on the other hand, a new implementation may have to face new contexts of use and the initial solution should be presented in a sufficiently flexible way to allow eventual adaptations. So the 'design question' VAP therefore faces is to create new VAP antennas supported by new groups of promoters in other urban contexts. Moreover, the replication process should be self-supporting: the strategic design will then empower new candidate promoters with a replication process that they may afterwards handle autonomously, passing by both the flexible specification of service and the process to implement it.

Logement Intergénération

[8] this figure seems to be the repeating the actual state of mobility in Belgium: 80% moves by car, 8% on buses and trams, 6% by train and 6% on foot or bike.

Logement Intergénération was born in 2004 with the aim of encouraging single seniors to offer spare rooms through cohabitation opportunities to students in Paris. This initiative is supported by three mediators and part of a national network of 14 associations offering similar services under the name of «Logement Intergénérationnel et Solidaire» (L.I.S.). The president of the Parisian association, Chantal Dorval, explains been inspired by similar initiatives already existing in Barcelona for about fifteen years. These initiatives are trying to tackle a more local problem of scarcity and excessive prices of student bed offers on one side and the more global issue of reducing the loneliness of elderly people living on their own on the other in the Catalan city.

The challenge of Logement Intergénération is tightening the precious bonds between different generations in a society where these are becoming more and more loose. The older person and the student form a kind of “new family” and the affection that they share makes both forget their respective feeling of loneliness (students often have to move miles away from home and feel lost in a metropolis like Paris) and help them sharing unexpected interests and passions. This new stimulus helps the elderly to feel the need of improving his social life (going out, etc.), sharing his feelings with somebody ready to listen and tackling daily actions that isolation normally discourages (cooking, cleaning, etc.). On the other side, they also help the student having a solid point of reference on which they can count on. Nowadays, the association has helped forming about sixty "couples" that of course continue their "family relationship" even after their co-housing period.

Logement Intergénérationnel is based on the principle of reciprocity: students are offered a room (and often a bath and an individual kitchen) during a school year in exchange of a certain number of services (and sometimes water, gas or electricity expenses). The fact that these engagements are listed in a personalized chart, signed by the two sides before the cohabitation starts, prevents possible abuses from both sides but also helps the parties not to forget to take care of the other despite any unforeseeable event. The room is often offered in exchange of a common dinner or lunch twice a week, daily dog walks and some shopping.

The service comprises 100 euros for each party and, according to the founder, the sum covers the costs of professional shows (Salon des Seniors, etc.) and Internet, flyers, press and television expenses.

This relationship, based on solidarity, implies discretion, respect and trustfulness and requires both parties to be meticulously understood and coached by the association. During the visit of an apartment, aimed at checking standard quality requirements, the elderly person is registered while explaining his or her motivations. On the other side, the student has to undergo a thorough interview during which he or she has to prove his understanding of the service and show his willingness to support his future host. Logement Intergénérationnel accepts the « new families » only when intentions on both sides are fully complementary and a harmonious co-housing is then envisaged.

The profiles of the two parties is generally is as follows: the elderly are often open-minded and lively women living alone in large flats with one or several empty rooms that used to belong to their sons and daughters; suffering from loneliness and afraid of being alone (especially during the night) the are happy to be useful to other people (they never do it for money reasons). The young ones are generally responsible, good students of both sexes (even if old women often prefer sharing their homes with female students), often just arrived in Paris, belonging to large families.

Up-scaling the solution goes through growing the capacity of the initiative to match more couples of students and elderly people also tanking into consideration the need of students to live with seniors of all ages (even younger than 60!). Nowadays the number of students asking for this service is much higher than that of elderly people, and the promoters are working on balancing offer and demand. They are also taking into consideration the opportunity to offer the service to young workers and not only students.

These developments are limited by the work that the 3 mediators are able to produce and

by the time and involvement required to create sufficient dialogue between the 2 parties to ensure the relational quality for a durable relationship;

The 'design question' Logement Intergénération is therefore facing is to enable each couple of student and elder person to explore more autonomously their mutual expectations and agreement for a co-habitation.

3. Co-design of enabling solutions...

This second part will describe the definition of generic solutions and its tentative decomposition into a set of *solution elements*. Teams of designers together with the École Supérieure des Arts Visuels of La Cambre in Brussels[9] and the École Nationale Supérieure des Arts Décoratifs in Paris[10] where involved in co-design sessions with the respective promoters of the initiatives. Tentative implementation loops with groups of future promoters or users allow to progressively explore the different facets of the solution beyond its current implemented forms and embed it into a set of enabling cards to support their up-scaling.

VAP

In order to define and discuss characteristics and boundaries of the generic urban hitchhiking service, co-design working sessions were organized first with the VAP promoters and then with different actors of alternative mobility in Brussels. Being VAP the first and more experimented service, the aim of the session was to register and use confirm all the experience collected during its three years of activity. A first representative scheme of the service focused more in the dimension of the service's characteristics and related options were proposed to tease conversation. VAP, like most cases of social innovation, tends to be an informal initiative growing organically with low capitalisation material where the essential knowledge is stored in the memory of main actors. Therefore stimulating conversation with a tentative decomposition of the solution was of great help.

A second co-design session involved most representatives of alternative mobility initiatives in Brussels and representatives of two candidate groups to implement new VAP antennas in Ottigny and Villers-la-ville (both in the close periphery of Brussels). The objective of this second session was to fine tune a second version of the solution elements and to introduce it to these new groups of promoters that will be the first users of the tool. The support of a semi-structured approach was particularly discussed and appreciated. It answered a typical issue of voluntary user's attitude, characterized both by a high level of requirement as users or potential users, (their preoccupation reflects a very fine level of expectation in usability, problem analysis, critical approach...) and at the same time a lack of project management capabilities -except for some involved professionally in similar activities, the difficulties to adopt a structured approach, to turn critics into problem solving, to prioritize actions... tends to result in a much longer negotiation process that directly enters in competition with the willingness-to-do of volunteers.

The final format, agreed with the different actors in order to decompose the generic urban hitchhiking service, is structured into a solution on two levels: *solution elements and solution options*.

[9] ENSAV La Cambre (National High School of Visual Arts), course of "Eco-design & Sustainable Development" 2007-08 coordinated by F. Jégou including students from Interior Architecture (Bux R., Cailleaux J., Carchon S., Nys M., Su L., Verhelpen C., Seutin S., Busiau A.) and Industrial Design (Casale A., De Brouwer B., de Smet M., Floriet G., Kunysz N., Senny A., Vallejo C., Van Ravestyn M., Von Ostrowski J.)

[10] Workshop "Scenarios building for a more sustainable everyday" hold by F. Jégou and A. Bernagozzi with a group of fourth year students in product design. In particular, the group who worked on the Logement Intergénération initiative was composed by Bayon L., Jaloux M. and Willerval V.

By solution elements, we intend to describe different components necessary and sufficient to constitute any particular urban hitchhiking service: This first level of decomposition focuses on what is intrinsically characteristic to the service, including all dimensions that are mostly emblematic and that differentiate it from other service categories. In other words, this level corresponds to what is necessary to mention when described by any external observer. For example: *particular 'vehicle & hiker identifications' are provided by the service; no specific 'picking-up point' are defined, but an 'identification of destination' is shown through signs held by pedestrians; the 'trip type' is focused inside a city sub area and no "benefits and payments' are exchanged; etc...*

The second more profound level of decomposition shows various options available for each dimension described in the first level. They correspond to possible alternatives within the service's design, as various exclusive or complementary choices to be made, defining a particular instance of the service. For instance: the 'hiker identification' dimension could be established as users raising his/her thumb and thus, 'no particular hiker identification' will exist; or as a 'discreet identification' such as a hiker card; or also a 'highly visible identification' such as a jacket for more efficiency, security and promotional reasons.

In order to facilitate appropriation by users and manipulation during discussion of a possible antenna, the solution elements have been shaped as pocket size cards. 40 cards have been defined covering 12 main dimensions of a urban hitchhiking service. The two dimension levels and options are written on the cards as well as examples when necessary. A visualisation is added: both facilitating the identification of each solution element and helping users to differentiate cards easily. The visualisation is made out of a photograph of a current situation (i.e. cars in the street; street curve...) on which the possible solution elements are added in a simple, visible sketch form. This mix is useful to produce a balanced feeling between a semi-finished service still to be adapted and an already implemented or feasible solution. The name and logo of a generic service has been set to maintain both connection and distinction from the already on-going initiatives naming it "CityStop". Blank cards were also provided.

More than helping to structure and formalize the solution, the progressive construction of the cards reveals some problems in the core definition of the VAP service. VAP members are progressively growing from its launch in 2005 reaching now around 670 persons and the raising interest in the service seems to confirm this trend. As previously mentioned, other groups of promoters intend to launch VAP antennas in other areas in Brussels and in local towns around. The different initiatives on alternative mobility listed before are discussing an agreement and a platform of action around urban hitchhiking. Nevertheless the critical mass of users still needs to be reached in order to consider it as a fluid alternative in urban transport.

Among the different initiatives, VAP is the more representative of what an average urban hitchhiking service may be and the most advanced in field experience. As said, VAP members can sign-up choosing between three options: as drivers, as pedestrians or as both. The VAP database counts at the moment approximately a quarter registered exclusive drivers, a quarter as exclusive pedestrians and half the members being sometimes drivers and sometimes pedestrians. The feedback collected by the service's promoter shows a different reality: more than 70 % of VAP members are most of the time drivers and only 30% tends to use the service as regular pedestrians. The figures of Comobil, a second and smaller initiative of urban hitchhiking in Brussels, 2/3 drivers and 1/3 pedestrians, seems to confirm this phenomenon. This remarkable difference reveals an important `inequity` in the distribution of members, equal to the national mobility panorama, and probably a less positive picture about the service's success than the growing membership tends to demonstrate. "Drivers are desperately seeking for pedestrians to give a lift to..." reports one VAP driver. Although no formal inquiry has been made, this remark seems to portray a shared feeling among members of the service. But, if this problem is true for most of the drivers, some of them -mostly the core group of promoters who initiated VAP- demonstrates a completely different situation: when driving, they tend to give pedestrian's a lift 3 to 4 time per day. Observing more carefully their behaviour reveals that they are actively looking for pedestrians. A video observation is currently in progress to define more precisely their

strategies of behaviour but it is already obvious that they look carefully at pedestrians; they spontaneously stop to ask people if they need a lift without any explicit signs that they were auto-stopping. It seems they have developed a particular acuteness to guess potential hikers in the similar way a taxi driver recognises potential clients through their body language before they call for a stop. In other words, they are hunting for pedestrians!

This remark leads to a radical change in the service definition. The difficulties are due to a lack of pedestrians and not lack of cars drivers. If at a mature stage of the service (beyond a critical mass of members) urban hitchhiking could be understood as "a service that fair-play drivers give to pedestrians"; yet during launching stage, to install the service habit, should be undoubtedly interpreted in a totally opposite way as: "a service that pedestrians give to conscientious car owners that feel guilty to drive alone in their cars..."

This fundamental finding triggers deep rethinking of VAP service, and opens brand new possibilities in the decomposition of solutions elements and options. The development could now focus particularly on drivers. Being a VAP member, they potentially change status from mainstream car-owners to car-owners making an effort towards alternative mobility. This motivation is certainly very interesting and should be used in the service's promotion. If drivers seek pedestrians, would they agree to do some efforts to look for more actively and therefore support the efficiency and development of the VAP?

In terms of matching offer and demand, traditional hitchhiking is based on long stretches of common journey along main roads. In urban-street environments, the difference between the destinations of driver and hiker tend to be not very significant and most of the time a driver would shift his/her route to drop the hiker at final destination. Barring in mind that VAP drivers are offering lifts, they could be asked to systematically make the effort of a slight detour in their route and pass more often where lifts are needed accordingly to their destination: zones lacking from public transports, lines terminus or commuter railway stations... The VAP promoters are therefore discussing with the Watermael-Boitsford municipality, where this service is based, for the installation of three VAP pick-up points to test this hypothesis (see figure 1, fine tuning the enabling solution).

In terms of service promotion, VAP promoters have a very limited budget. The initiative develops mainly thanks to their word of mouth efforts and some small subsidies to print leaflets. The VAP stickers on the cars are probably the highest point of visibility of the initiative. Knowing that drivers potentially change their mindset thanks to VAP, from mainstream car-owners to car-owners making efforts towards alternative mobility, they would be happy to promote the service even more than through a small sticker on their windshield. They are then described in the new definition of the service as 'ambassadors': they are given VAP leaflets to distribute and some of them will apply a large VAP promotion to their cars (see figure 1, fine tuning the enabling solution).

We could multiply the examples of shifts in most dimensions of VAP service, as it should be seen. This strategic design operation leads to a conceptual redefinition of the service and a change in it's meaning: **"VAP is an initiative of drivers",** not pedestrians. This simple working definition shows the essence of the initiative. One of the initial motivations to create VAP, as afterwards reported by Claire van Bellingen (VAP creator), were on the one hand "solidarity to people on foot in a rush, carrying heavy shopping, waiting too long for their bus" and on the other hand "the feeling of absurdity of driving alone in a four seat car".

This mindset shift will allow to reshape and reorient the service development. It points clearly as we already said, at a set of motivated drivers to promote and further expand the solution. They embody the current 'strength' of the initiative who should be definitely activated. The target of VAP could also be refocused following the same mindset: the service's core objective are only short occasional trips in dense urban environments. Any regular commuting or longer journey is out of focus.

If the objective of promoting VAP and its antennas is at the end to reduce the number of current drivers and make them jump in someone else's car, the public targeted by the service are certainly to be found amongst single and young couples with no car yet, elderly with time and reduce mobility, inhabitants of saturated urban areas, etc… ; in fact, anyone who is sensible to the issue but has no interest to own a car. But it is obviously not amongst the current and future VAP drivers; that if they subscribe is because they feel 'guilty' to drive alone, which subsequently also means that they don't intend to stop driving. So they agree to give up part of their comfort by taking hikers on board to go on using their car...

The first set of cards developed has been entirely revisited and up-graded on the basis of the first experience of dissemination with a new group of promoters in the suburb of Brussels. It is now being tested with a second group of new promoters in Wallonie.

Logement Intergénération

The first analysis of the initiative Logement Intergénération as described in the previous section, shows a bottleneck in the capacity of the current 3 mediators of the association to match demands of students and elderly people. This activity requires much more involvement than simple requests matching on the base of localisation and time; the viability and success of a cohabitation depends on multiple factors from: the association of profiles between the two parties, the agreement on the use of space, respect of schedules, nature of the help provided in exchange of logging... going to more psychological issues such as the compatibility of personality of elderly and student, the building of a family-like relationship matching each parties' expectations but respecting their respective cultures, freedom, privacy... Reaching this level of mediation is also time consuming both in the careful choice between offer and demand and meeting time necessary to explain the principle of exchange of Logement Intergénération: introducing elderly and students, starting communication between them and ensuring a follow-up assistance in case of difficulties or even conflicts.

On the side of mediator's activities, the system uses very few tools but a contract that defines and establishes key elements of the agreement between elderly and student. The document is based on 2 pages of fill-in questions according to the type of agreement decided, signed by both parties. At first sight, this very concise document may appear somewhat difficult to frame: half way between an excessively formal questionnaire, raising issues to be discussed before settling an agreement; and a rather primitive contract to define precisely rights and duties of both parties. But it's interest lays probably in its ambiguous nature; on the one hand it's a contract with all its official weight, complementing mutual interests and friendship that may rise spontaneously between an elderly person and a student. It shifts the solution from an informal social agreement from person to person to ensure both parties a certain level of involvement and reliability in time. On the other hand, it recalls the nature of a support to prompt social and psychological conversation much more than the one of a formal contract. In the detail, a large part of its content seems to tackle with secondary issues for a co-habitation such as what will happen during holidays or who will be there for the other's birthday... This type of question seems to embed the experience collected along repeated mediations trying to avoid misunderstandings and raise discussion over potential conflicts.

The nature of the relationship between an old and a young person is somewhat ambiguous in comparison with an owner-tenant agreement which results in a sort of mutual adoption between an elderly person and an a student far away from his or her family, both often lonely, so the starting point of the relationship is already far from away from renting a logging on

an economical basis. The exchange of mutual help recalls a relationship between friends or relatives: the first offers to share his/her own living place and the second offers to support household chores in return that the first cannot do alone anymore. As established, this potentially deep and rich agreement may also lead to misunderstanding and excessive expectations from one or the other (i.e. it is natural to think that if people are sharing their everyday life all along the year, one is expecting that the other will not leave him or her alone during holydays or during his or her birthday...)

On the basis of the analysis of necessary mediation, it was decided to propose a set of cards to support in a more extended and autonomous way the social conversation between elderly people and students. Compared to the set of enabling cards described before for the multiplication of the VAP initiative, the situation in Logement Intergénérations is similar but slightly different. The diffusion of the solution is expected here at user level and not at promoter level: the 3 mediators may use the cards to enable each potential elderly/student couples to discuss and build their agreement. But the same kind of adaptation of the initial service idea is needed to each specific context of co-habitation. The service's decomposition into solution elements may therefore follow a similar structure: a first level of solution characteristics lists what are the key-issues to constitute a solution (i.e. private/collective space; nature of the help provided in exchange of logging; repartition of the collective tasks...). A second level enumerates possible agreement basis for each of the first level characteristics (i.e. the help provided by the student may be to do the shopping, to cook, to help in the cleaning of or even to simply spend some time with the elderly person if he or she feels lonely...).

The main difference between facilitating the dissemination of VAP antennas and supporting the matching process of Logement Intergénérations probably is in the formulation of the design demand. VAP is a rather specific solution with a precise articulation of characteristic solution elements and a limited number of options for each. The cards should then enable promoters of a new VAP antenna to grasp the concept's solution composing an adaptation between the presented options, to a point of public agreement translated into a service's offer. For Logement Intergénérations the solution's concept is more simple and based on the research of balanced personal agreement on all topics regarding co-habitation. The design demand is then to provide an extended check-list of these issues to be raised in the discussion between elderly and student. The agreement that should be reached on each of these issues is then private, between parties, therefore no list of possible options can be really pre-defined. The key-point of a robust and durable agreement is that none of the issues touching co-habitation should remain unclear or not discussed. As there is a need for concrete conclusions of action and behaviour, mutually the most difficult thing to rise in conversation is the point of view of the other without preconception or *a priori*. And that's probably where matchmaking is tricky: the common social representation of such a co-habitation and of the related problems it may raise is often distorted and full of clichés: is the student trustable? Will he/she respect the place where he/she is hosted? Is the elderly not too invasive? Will he/she respect freedom of the student? etc...

Instead of options for each solution elements shown in the cards, it was proposed to show for each issue the point of view of both parts inducing a certain reciprocity, starting with simple things (i.e. the student "Doesn't smoke in the living room, the bathroom..." versus the elderly "Smokes in his/her room, the balcony..."). Lots of cards are focusing on daily chores, trying not to forget anything (i.e. "Carry the shopping", "Wash-up", "Organise collective spaces", "Share expanses", "Feeding the cat", etc...). Certain topics are proposing related points of view without referring them explicitly to one of the parties (i.e. "Helping in the kitchen, for me, for both, when I feel like it" and "Prepare the meals time to time, as pleasure"). The concepts are chosen to already suggest a balanced agreement (i.e. the space should be kept between "Clean enough" and "Not too dirty"). An effort is made also to talk about all points (i.e. "Pick-up a drug at the pharmacy, time to time, helping out" "Alert the doctor if something goes wrong"), to avoid taboo (i.e. the question of behaving with boy/girlfriends, "Staying overnight", "Hosting the partner" is not only a matter for students but also for the elderly couples). Beyond questions of domestic chores

and territories, emphasis is also made on feelings (i.e. "to rely on the other" and "to simpathise with the other") and mutual enrichment (i.e. "Transmit knowledge" and "Exchange know-how").

Each enabling card is printed on both sides picturing the duality of each issue presented: every idea has its contrary, each point of view has its opposite... It plays with the symbolic aspect of card games turning a card upside-down: it reveals something unexpected, challenging, a key-issue or a simple friendly wink... they are illustrated with pictures showing a student and an elderly character evolving in their shared household, pointing out details of private everyday life as well as social relationships with friends. Each situation is described with some key-words to clearly point out an issue but also playing with humour or irony. A blank space is available below the text to complete or customize it. Empty cards are also available for specific issues (i.e. "My expectations" "Your expectations"). The all set of cards displayed on a table give the impression of a sort of possible photo-story of a relationship between a student and an elderly person: it suggest a scenario of co-habitation full of love, attention and respect... (see figure 2).

All together, the set of cards tries to go beyond the social cliché and proposes a renewed image of both youth and old age, an image of a balanced co-habitation based on equity and collaboration between generations, a new kind of relationship half way between the warmth of a family and clear agreement between parties.

Finally, when both parts have "played" enough with the cards, discarded some, overwritten others, bargained on expectations and agreed on a possible cohabitation, they conclude in a set of cards that anticipates their story of life together. They will keep them and maybe sometimes come back to them to discuss problems or misunderstandings. The cards therefore have a hole on top so they can be collected and attached, sealed together as sort of "visual contract" between the two parts, as a promising agreement.

A first set of 48 cards has been developed and fine-tuned by a group of 3 students (Linda Bayon L., Mathilde Jaloux and Virginie Willerval) within a workshop at ENSAD in Paris. The cards are currently being tested by the 3 mediators of Logement Intergénération.

4. Conclusion

These on-going experiences show different characteristics and applications of strategic design to support diffusion of promising social innovation and the development of *enabling solutions*. In particular, the use of *enabling cards* allows supporting two steps of development of an existing initiative starting from the context of use where it currently develops into a new one.

First in the introduction of the initiative, the cards allow to present and give visibility to an enabling solution. Social initiatives as the ones described in this text, often reveal to be complex services. This complexity tends to disappear behind the informal setting of the solution, but going further into detail shows a subtle balance between flexible organization and social involvement, slowly evolving into experience embedded into the promoters' practice. Explaining properly the solution, showing its reliability and social qualities it activates, requires describing its complete panorama of characteristics. *Enabling cards* are very useful for that: they allow showing multiple facets of a solution, to present them progressively to any interlocutor entering into important details without threatening with too technical language.

Second in the fine-tuning of the initiative, the cards allow to support the strategic conversation between groups of participative promoters, to customise solutions to particular contexts of use, to set a temporary *visual agreement* between the actors involved, finally to

discuss and organize progressive development stages of the initiative from launch to a mature service. Within a dissemination action, it's important to question each dimension of the service using a set showing different option-cards to tease reflection amongst people with knowledge of local context. Then the physicality of enabling cards as building blocs, easy to manipulate, compose, and reorder, made them an ideal tool to empower people who are not accustomed to project thinking, to feel confident in composing a customized solution, and from there, to involve in implementing it.

To conclude, if we look now at these experiences from a broader point of view, we see the appearance of situations of co-creation both from the point of view of users; taking more and more part in ideation and implementation of products and services they use; and from the designers' task, evolving towards *open design processes* enabling these users to design their own daily living. An *enabling solution* in this context can assume different settings and scopes.

Design teams working on facilitating the dissemination of a grassroots initiative may choose to start from experiences as analysed above to develop an *open solution*, a package or toolkit containing all the material and immaterial elements such as guides, rules, programmes, specific products, dedicated software... to facilitate the construction of a new solution. This solution is open in the sense that all proposed instruments offered in the package may be used or not, up-graded and modified by new promoters or users of the solution. This flexibility allows the necessary adaptations to multiply the initial initiative in different contexts.

The experiences reported above suggests to go one step further and consider the interest of an *open design process* on top of the *open solution*. In both cases of VAP and Logements Intergénération, the definition of the enabling cards as one first tool toward the constitution of *enabling solutions* provoque important feed-back and redefinition of the solution itself. The contract initially used to prompt social conversation between elderly persons and students from Logement Intergénération expands into a much longer list of issues instantiated in the cards. The dissemination process of the VAP as Claire van Bellinghen stated after the initials meetings with the group of new promoters of the solution "taught me more about my initiative than I am able to teach about it". The transposition process is a redesign process. New promoters 'rediscover' the recipe more than they 'apply' or 'interpret' it. The existence of enabling cards (or any other enabling tool) speed-up this redesign process, asking the key-design demands, guiding the development steps and suggesting sets of already generated ideas... And the result is even more promising both because the very nature of the 'ingredients' of the solution is deeply questioned at each transposition loop and because new promoters feel to be deeply empowered by the 'new' solutions they develop more as 'creative cooks' than 'recipe preparers'.

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Fig. 1: The Urban hitchhiking, Voitures a partager (VAP) solution is portrayed.

Fig. 2: The Intergenerational lodging solution is portrayed.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Real-time layouting

A design "way of doing" to improve participatory process tool-kit, applied to the conversion of buildings

Elena Enrica Giunta[1]

Abstract

The **topic** of the paper is to make a connection between design discipline (and interior design as specific field), the contemporary phenomenon of abandoning urban areas and participatory processes. The aim is to clear that urban re-functionalization may represent an opportunity for design to research on "how" to deal with these types of systems. As the basis of the design discipline is to produce innovation strategies and design method, according to own proper dialogical skills (briefing methodology, lateral thinking and other forms of brainstorming, problem setting/finding attitude etc.), it becomes an essential instrument which may intervene in reshaping urban abandoned areas.

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*iper*industrial age[2]

"*Economists predict that the biggest industries of the 21st century will be the social industries, health, education, wellbeing etc. These will contribute 30% to the economy. The old industries such as cars, IT, telecoms will contribute 5%*" (Green 2006). According to this vision, **social involvement** can be read as the key to predict success or failure of a project[3].

All over the world, there is an increasing demand from all sides for a deeper local involvement in planning and dealing with spaces. This is the only way for people to be satisfied with the environment they live in, and it is the best way of ensuring that communities become safer, stronger, wealthier and more sustainable. *"Considerare la dimensione dell'interazione sociale ci rimanda alle questioni del punto di vista e del potere"*[4] (Pozzobon 1994). This statement underlines the necessity to develop a design strategy able to analyze, to understand and to solve the project's need from an ***emic* point of view**. The term "emic" is referred to anthropology: it means the inner point of view of natives, with their beliefs and values.

"Anche qualora vi fossero i fondi sufficienti per istituire nuovi servizi, costruire nuove forme organizzative non co-progettate con la gente rischia di colludere con quella diffusa spinta alla delega e alla rivendicazione che finisce con il nascondere il fatto che le persone verso la comunità non hanno solo diritti ma anche doveri, e che l'esercizio della solidarietà, da sostenere con grande discernimento e consapevolezza delle ambivalenze e dei conflitti che vi si annidano, è oggi l'unica via per dare un nome e gestire i nuovi problemi che si stanno presentando"[5] (Mazzoli 2005). This is the way researchers and professionals in general should approach research and briefing collection. This approach is similar to the ethnographic one; it represents what the psychological discipline calls *theoretical participant*, i.e. one who is able to develop empathy with the context, yet with a detachment which is functional to its effectiveness.

Furthermore, it is possible to demonstrate that processes of local involvement, based on the 'designing *with* people' approach, are able to support signification processes. As it is well illustrated in the research carried out by the psychologist Mihaly Csikszentmihalyi and his colleague Eugene Rochberg-Halton, material possession in contemporary urban life is one of the most powerful ways for people to build their identity, carving meaning out of things and environment. Their work is based on an analysis of some families in Chicago who were interviewed about their domestic environment. The survey contributed to draw on a series of transactions between people and things and to develop a *model of "personhood"* in which goal-directed action and the conferring of meaning through signs assume vital importance. This piece of work outlines two interesting ties, useful for the design project: first, the distinction between object valued for action and object valued for contemplation or, in other words, the co-existence of a functional environment and a symbolic one; secondly, the role of **emotional attachments** to things and environment in order to develop relational patterns. The relationship "subject *to* object", or more specifically the one "people *to* environment", may represent a real model of non-verbal relationship (Veronese 1998)[6] by which men try to secure themselves the possibility to recognize and to self-construct, while keeping an open dialog with the *habitat*.

All previous thoughts are coherent with the features of the current *iper*industrial age, whose main concepts are briefly resumed in Fig. 1.

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[2] As defined by Ubaldo Fadini, professor of Aesthetics at the University of Florence.

[3] As example if education, engineering, policy or design are 'done *to* people, not *with* them' (Worpole 2000), they fail.

[4] "Considering the dimension of social interaction brings us back to the issue of the point of view and the power."

[5] "Even if sufficient funds were available to introduce new services, building new organizational forms which are not designed together with people is a risk. It might in fact collude with the input to delegate, which hides the fact that people not only have rights, but also duties in regards of the community, and that solidarity is the only way to define and deal with new problems".

[6] Text ref. Dell'Acqua Bellavitis, Arturo, Diana Eugeni, and Claudio Valentini. 1998. *IpotesiTardoContemporanee.* Milano: Franco Angeli ed.

Fig. 1: Key words about the change of paradigm, in epistemological terms, of current age. Contemporary attitude is defined, by a series of authors[7], as a "barbaric mutation" age with own proper characteristics.

Participation is meant as a way of designing and managing urban transformations. In the field of physical transformations, the citizen participates only to profess him/herself against something he/she considers penalizing. The non-paticipation trend can be identified in the *"difficoltà a riconoscersi nei luoghi della città, in spazi che non possono definirsi né identitari, né relazionali, né storici"*[8] (Augé, 1993). **Participatory processes** should be necessary to make public spaces evolve into collective ones; indeed, participatory processes intervene to refresh a design practice which is no longer able to preview *"le istanze di qualità di vita, di fondazione di identità, di rapporto equilibrato e profondo con il territorio e la storia dei luoghi"*[9] (Ferraresi 1995). Over the past few decades, a wide range of methods has been pioneered in different countries: these include new ways of interaction among human beings, new kinds of events, different types of organizations, new services and support frameworks. At the time being, teams that deal with participatory processes are interdisciplinary; the équipe is often composed by sociologists, architects and planners, commonalities, citizens. The design process is structured in five phases: formulation, actuation, planning, realization and verification. The concerted approach gives more emphasis to the actuation phase, as it is the one that involves many decision-makers, who together identify needs, define objectives, write projects; this process represents the co-design dynamics. This kind of approach starts from the hypothesis that a given reality changes when confronted, negotiated and concerted together with the receivers of such change. The following phases are a consequence of these actions and of their common influence.

Recently, even designers have found their role in these team-works: their strength is mainly identified with their strategic attitude and visioning activity. In particular, an interior designer may provide a specific professional support in participatory processes applied to re-funcionalization of abandoned buildings, playing the role of **technician-facilitator**. The designer might develop a reflective skill and a willingness to fit his disciplinal knowledge (as well as know-how), due to local attitude and needs. The purpose is to generate maximum involvement, throughout formal and informal strategies, in order to build a real dialogue between community and government, linking each other's mutual expectations. Consequently, the **purpose** of the paper is to clear how the interior design practice can play an active role in participatory processes

[7] like Delzìo, 2007; Baricco, 2006; Corretti, 2006; and Goleman 1995.
[8] "Difficulty to identify oneself in the city spaces, which cannot be defined neither as relational, nor historical".
[9] "The insistence on the quality of life, on foundation of an identity, on the creation of a deep and balanced relationship with the territory and the history of places".

with an own proper instrument, which can be added to the existing ones to improve the specific methodology.

collective outsourcer

"L'analisi dei bisogni non è più una accurata classificazione delle esigenze del sistema. E' piuttosto un processo dialettico che coinvolge gli utenti -portatori di domanda, i tecnici e gli altri decisori deputati a fornire una risposta, che si sviluppa secondo un percorso di progressiva e reciproca chiarificazione delle esigenze degli uni e degli altri"[10] (Bellaviti 1994). In order to identify the nature of the outsourcer addressed in such type of design processes, we refer to the definition of **local community** as *"dimensione territoriale, luogo di vita e di scambio e ambito di relazioni, spazio privilegiato per la partecipazione sociale"*[11] (Martini and Torti 2003). Such definition highlights the three knots that found the sense of a community subject: places, shared value component and participation. We must learn to identify the community as a social subject, not only as a catchment; this simple shift in our point of view allows the designer to imagine the consumer as a series of active citizens, that have resources and skills, a self-defined identity and that tend to self-determination; able to stimulate a sense and forms of responsibility. Referring to models of social planning (Leone and Prezza, 1999) and trying to transfer and translate them into design practices, we can observe how the participated project for building reconversion moves with a certain freedom on the axis of the design pre-structuring. We can tackle this type of process emphasizing the planning or the actuation and the continuous re-orientation of the project praxis, i.e. choosing a synoptic-rational approach or aiming at the heuristic project[12]. The synoptic-rational approach does not help to think the project as a flexible instrument, able to direct decisional processes along the way; what comes out is the image of a designer who can predict a definite future. The failing consideration of social interaction, of the variables of the process and, last but not least, of the cognitive and emotional levels of the actors involved (multiple outsourcer and designer together), disconcert the thoroughness of such approach. Moving from one extreme to the other, we come across the **concerted approach**, a dialogical-participated design form that, according to the author, is the feasible and meaningful way to orient design processes. The models of participated design derive from the concerted approach.

The promotion of an individual's direct participation should facilitate the transformation of a citizen into an inhabitant; such concept *"allude anche al radicamento in un luogo fisico e simbolico, contiene il riconoscimento della particolarità, a volte dell'unicità, del luogo vissuto, difeso progettato, prodotto trasformato, abitato"*[13] (Giusti 1995). **The subjects** obtain a higher and higher importance, as the operational outcome of the demand must be negotiated with them. Design is a process of identification of the alternatives; it must avail itself of the creative contribution of stakeholders[14] as the chosen solution should be verified on the basis of long-term effects that transformation produces on the urban and territorial context, which includes the possibility of appropriative mechanisms on behalf of the inhabitants. The inhabitant is a resource which enriches the decision-making process, being the only subject that is able to elaborate the new quality indicators[15] together with the designer. The inhabitant is therefore able to link such indicators directly to the objectives of the project.

[10] "The analysis of needs is no longer a classification of the system's needs. It is rather a dialectic process which involves users-carriers of a demand, the technicians and other subjects who are supposed to give an answer, which develops into a mutual clarification of each other's needs."

[11] "Territorial dimension, a place of life, exchange and relationship, a privileged space for social participation".

[12] With the term "approach" is intended a framework, both practice and theory, for participation which could be applied to various experiences and it is not defined by a unique 'way of doing'.

[13] "Refers to the entrenchment in a physical and symbolic space, contains the acknowledgement of specificity, sometimes of the uniqueness of the lived space, sheltered by the project, a transformed product, which can be lived".

[14] Or all those bearers of information and interests with respect to potential targets, these individuals are identified as particularly important interlocutors of the territory.

[15] Which should be necessarily emic and situated.

the phenomenon of abandonment as *field*

The urban adaptive re-use[16], due to the abandonment of industrial areas and new forms of entrepreneurship, develops new research fields within the interior design discipline, that can also be applied to designing a new habitat. Urban re-structuring has become a huge phenomenon of our century, which concerns Europe as a whole. This dynamic process taking place is "*a phenomenon of enlargement in appropriation of space for private use, able to generate a positive and creative movement of urban and social renewing, in which each person can find out own proper life project*" (Mello 2002).

The processes of urban re-functionalization, due to the abandonment of industrial areas, give space (and provide spaces) to develop innovation. In fact, the re-use of these structures requires internal transformation of a large part of the still existing ones. Industrial areas often contain fine, sturdy structures which contribute to local character. *"Usually, these kinds of places are huge open spaces that can be set up according to different situations and needs; they have not historical decorations, but at the same time they have a clear identity related to the industrial history of the place; they present a flexible space and system setting that allows a co-existence of many events"* (Telli 2008). Often, they are ideally suited for conversion for other purposes. The difficulty is in making a sufficiently bold transformation of an area to change its image, attract new uses and persuade landowners and others to invest in it. In this scenario, a partnership is established between the main parties, and an academic institution plays a key role in raising the profile of the area, assembling expertise and helping organise an action planning event to firm up a strategy that all actors agree upon. This may represent a rich potential for the design discipline (and for interior design in particular), becoming a wide field for applied research; a potential field for testing the capabilities of the discipline and its crucial role. Indeed, the co-design of a place's physical dimension may contribute to activate local community in terms of learning and self-meaning processes. New forms of coexistence and feeling of belonging shape themselves in the conception and organization of the community spaces, in which forms of participation, responsibility and self-organization need to be improved. The way public and common spaces are used stands for the feeling of belonging; participated design is in fact related to secondary urban works[17].

As we have already mentioned, the concerted approach represents an heterogeneous series of theoretical approaches, which refers to different disciplinary fields; their common assumption is that knowledge is not based on a parallelism with external reality, but on the observer's understanding of it. First of all, working with a community means shaping its images and representations, which derive from the community's self-observation, which embody its identity. Therefore, the initial phase of **the briefing collection** is vital for the project; in particular, it is fundamental in relation to what has been defined the *collective outsourcer,* in order for the designer to focus on the features of the community itself, before focusing on the ones related to service/space, which define the design activity. The re-foundation of listening techniques and analysis is of vital importance in order to oppose the separation of real needs and their interpretation.

At this point, interior design practice clarifies its essential importance as a "catalyst", which adapts the existing spaces to new roles and functions, trying to keep the identity of the outsourcer/community. The request of conversion of buildings would be answered with design working instruments and not only referring to the building industry. Rehabilitation of public and private open spaces responds in new ways also to the requirements of contemporary lifestyles, creating local centres in the outskirts, that concentrate activity around higher quality and more accessible public spaces. This action concerns the use of urban spaces, both from the standpoint

[16] Considering the needs of the National territory.
[17] Or in other words not concerning housing, but collective services and places.

of their pleasantness and attraction, and in terms of removing physical barriers, in order to include the weaker social categories. The quality of the urban environment can be regarded in a diffuse and pervasive manner (*housing quality*), or in a discrete and aggregate manner, to form features of central value (*quality of polycentrism*); the choice between these two modes is reached as a function of the features of the context, of the objectives of the policies, of economic availability and of presumed effectiveness[18]. For the design discipline, the **quality of a contemporary environment**, or in other words, the requirements the designer could add (trough the project) to make space livable and to allow a series of happenings in its interiors[19], is provided by the way the designer links the three actors of the system one to the other:

_*bodies* or the social component,

that is both individual and communities. The social component needs spaces designed for an individual use and also for group/community action; in each case space should be a vehicle of belonging.

_*objects* or inanimate actors on inhabited stage,

referring to the theory of expanded field, we can illustrate how "things" operate, as fragments, in a semantic symbiosis with their surroundings (space), due to their use (bodies);

_*spaces* or system of containers;

if conjunction is the current logic which defines the meeting of space with space, we can state that this interaction generates a threshold: a sort of blended area as interface. In these places of opportunity and transformation, we can experience the dialogue with objects and bodies, in an endless game between foreground and background elements.

interior design *challenge*

"Il tema dell'attrezzatura urbana e dei servizi collettivi è uno dei campi in cui si amplia e si intensifica lo scollamento esistente tra visione oggettiva del fabbisogno ed il reale interesse comune ovvero di una possibile condivisione collettiva, da parte di una comunità locale, di fabbisogni e desideri legati al territorio, alle pratiche di utilizzo dello stesso"[20] (Roncayolo 1978). More and more governments are willing to include their citizens, and have therefore shown a particular interest for inclusive planning processes.

In Italy, the diffusion of participatory practices in the urban transformation processes expressed itself through the development of single local experiences. National urban politics suffer from the effects of some European policies; in the same way, the revival of participatory approaches is due to the movement of sustainable cities and to the implementation of processes foreseen by *Local Agenda 21*[21]. The European Community, thanks to specific programs and funding[22], has promoted the logic of environmental regeneration, looking at the urban environment as the sum of physical as well as social components. On a national scale instead, it exists a political tool called **Neighbourhood contracts**[23], a typology of complex programs dedicated to the recovery of degraded residential neighbourhoods. Such contracts are made of

[18] The SURPrISE project, through its practices, constitutes an excellent workshop in which to try out and verify these principles. SURPrISE (sustainability on urban regeneration programs in southern Europe) is a project developed by OQR progreSDEC – 2007. Ref. http://www.progresdec.org.

[19] Also "urban interiors" are considered as interior spaces as well, due to their reference to city tissue.

[20] "The issue of urban equipment and collective services is one of the fields where the separation between an objective vision of the need and the real common interest of the local community related to use and visions of the territory becomes wider."

[21] Also in Italy is active, by a few years, a Coordination of these *Agendas.*

[22] Reference is to complex programs, firstly Pilot Projects (1993) then replaced by the European Urban.

[23] conceived in 1996 as experimental programmes (L.662, 23/12/1996) they were activated with the enactment of Decree 22/10/97 by the Ministry of Public Works. A second ministerial decree (n.2522 of 27/12/2001) initiated practical steps for the implementation of programmes called "Neighbourhood contracts II".

prescriptive regulations, which suggest the creation of equipped permanent venues on the territory, called *Laboratori di Quartiere* (Neighbourhood Workshops)[24], and the use of a participated approach in the recovery project of the community and it habitat, through forms of self promotion and self management. From the observation of political tools shaped *ad hoc*, emerges that the quality of cotemporary living is necessarily connected (if not dependent on) to that of social life.

"Individual acts and activities would become the new criteria of relevance" (Bauman 2001). Briefly, the assumption that "meaning by doing" is expression of the contemporary living attitude does not exclude any project! On the contrary, the new generation of interior designers should develop a working method able to operate both with a *systemic*[25] and *emic approach.* A crisis of the classical analytical and descriptive disciplinary processes emerges in the light of features and values with which we express the *iper*industrial era: the need to build open predictive models or criteria arises. The challenge is to simplify the analytical complexity without reducing it, by using a common and shared language; it becomes necessary to build a new relation among interpretative categories of urban space, the tools for intervention and the inhabitants themselves.

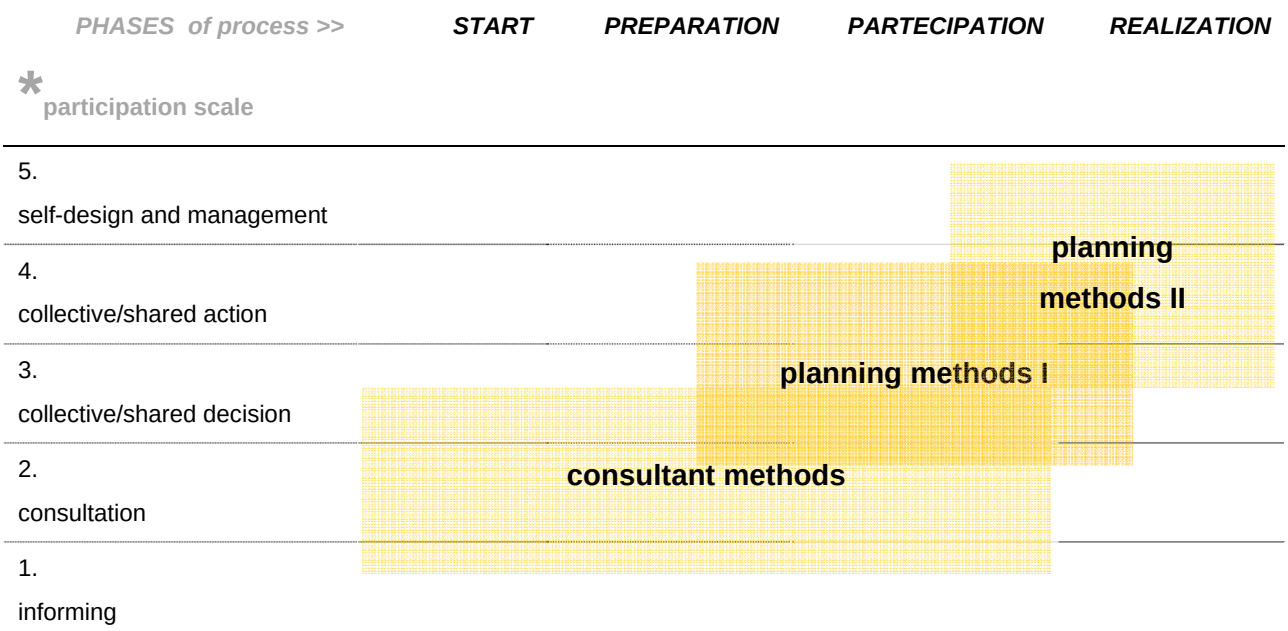
From the overview, we can suggest *exhibit design* as a specific approach of the interior design discipline, which is able to deal with these variables. To develop an interior design project in a non-exhaustive way opens various fields of application[26] to the discipline: physical environment should be organized with architectural supports and subsystems that could be freely combined by users. The principle very well meets the reconfiguration request of interiors, typical of the nomadic character of contemporary society, which is **designed and lived almost in *real time.*** Therefore, the temporal dimension becomes the new scale for the contemporary project. *"The vision of perfect reality argues both with space and with time, deleting qualitative dimension of space itself. However, space is expression of a specific time/age, which is similarly complex and historical"* (Bauman 2001). The term "real-time" must be read in two different ways, that lead to two visions of the contemporary project praxis. On one hand, *real-time* is an attribute of a tool that expresses its effectiveness in progress, i.e. in real-time with the project for which it is used for; on the other, the project outcomes are coherent only temporarily (*situativeness*), operating within a performance logics.

The performance logics shifts the project's focus from "how" to build to "why" build, and therefore invites us to consider real needs, i.e. the demand which determines actions aimed at quality building[27]. The concept of quality connected to the capacity of identifying and answering the local collective needs in therefore reinforced. Moreover, the idea of quality is strictly related to sustainability in relation to its three dimensions; in fact, it is not sufficient to improve the quality of the urban environment and help the collective outsourcer being economically independent[28]. In order to achieve the desired effects of urban regeneration, renewal measures should not only remove degradation, but especially involve the inhabitants in a strategy of local e*mpowerment*. With this term we intend the capacity of design processes to promote a new local identity by means of broadening the decision-making process; sustaining territorial awareness and social "belonging". The issue of social forms of involvement, previously dealt with, becomes even more evident: the users contribute significantly to determine not only the function of interior space, but the meaning itself. In this semiotic process, user and designer are both operating on environmental systems, as in a co-design process realized just at the end of the project flow.

[24] Real operational units which manage programs of Urban Regeneration. The latter are increasingly developed in conjunction with plans of Social Accompaniment.
[25] With the term "system" is indicated the whole object and at the same time the relationship between them.
[26] More concerning "everyday-life" compared to traditional museum or exhibition fairs. For example workplaces, enlarged hotelling (communities, schools, hospitals) and forms of temporary housing.
[27] Expressed solutions would result temporarily defined, open to changes in culture and therefore dynamic. Design answers, once implemented, could be made again in crisis.
[28] Or in other words to "produce by themselves" responses to their needs.

Furthermore, a percentage of unpredictability, which derives from **individual creativity,** is typical of this kind of projects, which interact with spontaneous behaviours[29].

Looking at the participatory processes as a chain of value, it is possible to outline a precise point where to insert something new and to make it longer and more useful (perhaps not complete), especially in the participatory experiences applied to the conversion of building processes. Design discipline has already developed a long series of techniques to visualize and construct shared scenarios. However, at a certain point, it is necessary to translate the common vision built up with these activities in a real strategy of space management; hopefully, at a second stage, this theoretical "manifesto" will be realized. An **interior designer** can have a precise role in these latter phases. *"It becomes decisive to be able to determine a design approach capable of recognizing the specificities of the context within which the project is called to intervene and, on this basis, determine the possible intervention strategies"* (Crespi and Rebaglio 2007). In order to better identify the designer's potential input and that of the set tool, we will briefly identify the currently available tools. The structure of the participated model connects the phases of the concerted project with different levels of active involvement of the social component. In order to take part in a transformation process, i.e. to actively influence it, it is necessary to differentiate the possible intensity levels[30].



In some circumstances, the lower levels, as for example the diffusion of information, are themselves essential elements of more complex participation strategies. Information, even if interactive, is much different from what we have here identified as consultation. The difference between the two modalities of involvement does not consist in a practical distance, but whether the opinions of the citizens in the real decision-making process are considered or not.

In order to comment the involvement of the superior levels, we would like to present a brief overview of the methods and techniques[31] used in the participated project, that are closely related to the architectural and/or design praxis[32].

[29] In use.
[30] "Ladder of participation" (Arnstein 1969). In addition to the five levels cast, the scale admits intermediate situations which include additional degrees and providing for the inclusion or exclusion of voices and local interests that in this paper, has chosen not to consider.
[31] Methods are different interpretations and alternative operational approaches. Techniques are tools designed to manage precise steps of methodology, with cultural, analytical, representative or communicational purposes.
[32] Collected data to illustrate this overview are mainly referred to: Neighbourhood Initiatives Foundation; and to *The Community Planning Website* (www.communityplanning.net/index.htm).

consultant methods: data search and listening

By consultation we mean the transformation of the communication flow into a structured interaction, with regard to a specific topic or problem. This implies the inclination to and the management of a multidirectional process of information exchange. The term “consultation” is often associated with forms of collective confrontation, and mistakenly identified with “participation”. Meetings, assemblies, discussion tables, internet consultations, referendums etc. are all forms of consultation. In such model, the power to decide the best solution belongs to the designer-decider (top-down), but the adoption of a more or less structured listening and comparison system allows the introduction of real cognitive local resources that contribute to the decision-making process.

Within the universe of active consultation, we can distinguish two approaches in data collection: an open methodology and a structured and closed listening. In the first one, collecting opinions and preferences aims at using the local knowledge heritage as well as perceptions and evaluations of the inhabitants as a starting point for the identification of design hypothesis.

choice catalogue	photographs or simple sketches about various design solutions (both urban and building scale) are collected in albums, which are used by little groups of residents to express their preferences.
field methods *as Suggestions box or Video box*	are instruments of discussion or investigation into the views of the community: people express their ideas about specific issues (by written form or video). Contents are immediately shared on large screens, generally in public places, in order to arouse the debate.
community appraisal	technique promoted by ACRE (Action with Communities in Rural England); it provides the establishment of an evaluation questionnaire on issues of territory drawn up by experts and representative citizens (of the local community). The analysis of that results is addressed to encourage action of local authorities and volunteers.
Parish maps	technique promoted by ACRE; it allows citizens to represent (by maps of different size, scale and material) the characteristics of human and natural interest that each attaches to the place where he lives.

When the technicians that guide the participated process, instead, have already defined the problem and formulated design hypothesis aimed at solving it, the listening activity is structured upon fixed alternatives, which are therefore close. Such techniques should illustrate the potential solutions in function of sharing, and afterwards give a priority to the preferences.

Open Space Technology	more than 20 years old, this technique is by H.Owen, an anthropologist lent to business advice. The OST has been tested in over 100 countries around the world to animate initiatives with a number of participants between 5 and 2000 persons. Particularly suitable to open a comparison on complex issues for which there is no unique solution; this technique allows participants to experience a highly innovative way of working together.
Priority Search *by Focus group or Philips*	a micro-team which represent the population has to structure a survey questionnaire. Data collected are as an overview summarizing the different priorities, hopes and opinions, criticisms in the community, and also the contradictions and conflicts between social groups.

The following participation phases represent the actual shift to a bottom up approach in the definition of strategic choices, which outline the needs and aspirations of the participants. The sharing of the decision-making process and the active involvement are close to the concept of empowerment, and promote a process of common work, able to create a frame for shared values and to identify the direction of development. Such projects perform decisional and strategic functions, but also procedural and planning ones; the two dimensions are often tackled together.

The concerted action occurs in form of brainstorming[33] or workshops, less formal and more creative than public meetings. The level of collaboration stimulates the hypothesis of a "partnership" between all actors that can put their resources at stake.

At this stage of the process, before moving on to any kind of strategic planning, it is necessary to create common visions. The term *visioning* combines the will to build a shared set of values, a system of objectives, and strategies and actions able to orient the development of the project. Through the visioning activity, citizens meet and build a concrete image of their future; the community visioning techniques are in fact based on a cooperative government system.

Future Search	members of different social groups, aided by experts facilitators, carry out four classic stages of the method: review the past + explore the present, create ideal futures, identify common round and, finally, make action plans. The community reflects on possible scenarios, future development (with a time horizon between 5 and 20 years). This identifies a preferable and determine the actions that you must take to achieve it. The future search allows you to achieve high degrees of consensus in a pre-trial phase and therefore can more easily take the subsequent development actions.
Community Visioning	stakeholders are divided in small working groups, in order to more easily develop a set of ideas and graphic representations on the possible and desirable state.

The citizens' involvement is important also in terms of making their vision of a desirable future more "concrete", at different depth levels. The methods used for this type of participated design will therefore vary according to the territorial scale of intervention.

planning methods I: *L and M design scale*

or, in other words, planning tool for landscape and urban project.

Action Planning Event	structured set of methods which provide for the definition of shared objectives and strategies for development. In order to achieve those objectives, it is generally directed to representatives of different local groups (sometimes extended to the whole community).
Planning for Real	is a role play method, created by the Neighbourhood Initiatives Foundation. Highly visible, hands-on community development and empowerment tool; provides for the start-up of the local community to improve its environment. PfR uses a simple 3D model as the centre of attention, on which proposal cards are arranged by the inhabitants. Suggestions are then priorized and options card are commented. Cards should be used on a diagram "Now, Soon, Later" due to enable the community district to outline its own strategy. After decisionmaking, local community actives its resources (and any external resource available) for the realization. To use the method, the NIF advise is to use experts or who have attended special training courses.
Strategic Choice	this approach is a research result of a work by some scholars of the Institute of Operational Research (IOR). The participants of the process are divided into groups of actors which are separated by criteria of: location (internal / external to the process) and role (political / technical). It is a process of plan able to strike a balance between the need to decide with urgency and at the same time make choices flexible and effective. In Italy, this method has been developed in particular by A.Giangrande (University "Roma Tre") and applied in some projects addressed to the Municipal Laboratory of Marconi district.
EASW *European Awareness Scenario workshop*	developed and promoted by DG XIII of the European Commission; it is based on identification process of different combinations of technology, public policy and actions brought by individuals and society, to achieve a model of sustainable local development. The Workshop lasting three days and it is divided into two phases: development of visions and proposed ideas, both are analysed on the basis of a specific plot "HOW*WHO."

[33] Conceived by A.Osborn is a method that stimulate the creativity of individual or groups. It is a procedure of problem-setting which makes possible the re-framing of the issue, transforming the initial unworkable proposals (formed by association of ideas) into tangible solutions.

microplanning or *CAP* *(Community Action Planning)* [34]	developed by R.Goethert and N.Hamdi, Department of Architecture at MIT; the method has been applied mainly in developing countries. A small group of local representatives engage a structured process of comparison; participants helped by experts contribute not only to content but also to build up the program. For each strategy, various operational solutions are formulated and, finally, the most appropriate are selected due to their feasibility and desirability. The process is referred to a specific location and directed by the interests of the community. The group of applying technicians are asked to provide an opinion on technical feasibility, chances of success, and so on.

planning methods II: *S and XS design scale*

or, in other words, planning tool for district/area and building project. Moving down in scale of planning level, we reach programming and transformative activities aimed directly at the action, no longer giving simple indications, strategic guidelines and constraints. These are design processes linked to intervention in the field of new construction or recovery of existing estates, characterized by different levels of complexity and multi-functionality. Usually, a design studio plans a complex without knowing the users of such spaces. The final product is often very far from the needs of the users, and is therefore due to be transformed and readapted in the future[35].

At this point, the implementation of participated planning activities might mean a higher level of effectiveness, efficiency and sustainability of the interventions, especially in the long run.

Pattern Language	concept developed by C.Alexander in 70s. It is a set of instructions (pattern), upon them the community, with the help of technicians, have to chose the most appropriate to the context of intervention, the aim is to design a satisfactory environment and ecologically appropriate for themselves and their activities, focusing on a single building or on a more general element of the context.
Design Workshop	small groups of professionals and inhabitants are working together in a creative way (through problem finding, project proposals, drawings), the most significant ideas are then summarized and fixed in design diagrams.
Design Game	this methods reminds jigsaw puzzles: participants are divided into working groups; different design elements are distribute on project plans up to define shared solutions of space. A highly visual way of allowing people to explore physical design options for a site or internal space; materials for making pieces are kept at hand to allow new items to be made as desired. Layouts produced by different individuals or groups are discussed and analysed as a basis for drawing up sketch designs.
Building Design & Conversion Kit	is a role play created by the Neighbourhood Initiatives Foundation; it is a design tool directly developed from PfR. It is based on the same concept but the kit is addressed to operate in a smaller scale. To best manage the method, the NIF advised to use the official kit: the Pack provides all materials to make a 3D physical model (including moveable walls, doors, windows, and some fixtures and fittings). It has been used for many types of projects, for example health and community centres, self-build and redesign of council housing.

Finally, the self-design level and management implies the highest involvement: it determines the (current and future) inhabitants direct control. Such level focuses on the direct involvement in the building and territorial production[36] and transformation process. The concept of self-management in such philosophical framework shifts responsibility and decision-making power to the final users themselves. In such perspective, the role of technicians changes: they no longer meet the needs of the public or private sector, but those of the citizens. Interior design practice should operate in this contest; particularly, it might be able to solve a primary function: to give the definition for new ways of using space (linked to the evolution of the more traditional functional categories). The

[34] Reference is the work of the research group SIGUS - Special Interest Group in Urban Settlement (teamwork of MIT School of architecture and planning, Boston).

[35] an example are projects for social housing, which in the past decades, often cause problems of vandalism and damage. In some extreme situations commonalities perceived to the demolition of buildings as unique possible solution.

[36] Similar approaches are adopted by NGOs, such as the World Bank in order to help the rehabilitation and development of shantytowns. In Great Britain, for example, the movement for the self-building (promoted by Segal) led to the realization of various groups of buildings; while in the United States, is very common to order the project of homes by catalogue. In Italy, we recall some experiences of the cooperative movement.

discipline may continue in design and using innovating devices such as new furnishing systems and architectural subsystems which encourage the adaptability of existing spaces or ones that have to be built *ex novo*. However all these issues must be managed, within an overview attitude, as parts of a unique strategy.

an *IDtool*[37] for the conversion of buildings

The interior designer needs to develop a tool which allows his/her practice, promoting the organisational dimension of the project (developed with a high social involvement) and useful to facilitate communication between stakeholders. **Real-time layouting** is an example of an effective tool developed to answer such needs; in particular, it makes the causal connections between demand and design proposals/outcomes explicit. It is a low-tech tool, that is used by the interior designer (playing the role of technician-facilitator) with the inhabitants; it is an instrument which can promote and sustain a social learning process becoming an adaptable *management tool* in the conversion of building contexts.

Initially, Real-time layouting was conceived for **XS-scale planning**. The specificity of such tool is to match the following variables: time and lifecycle of the building, user's needs and visions about spaces and its meaning, resources of the building in terms of potential space and available structure and stuff. The case study **"Sacra Famiglia"** in Como is an example of how to use the diagram in practice, for this specific goal. It is a reconversion of a 19th century country house (currently a boarding school) into a general's house for the congregation of an order of nuns called "Suore Figlie della Presentazione". The team working on this participated project set up with the religious community was a transversal one: an architecture and engineering studio for the brickwork, decorators and craftsmen[38] for the restoration of the heritage parts, a designer responsible for the interiors and the *Colour Plan*, several suppliers for the realization. In such case study, Real-time layouting has been applied as a valid support in the last two phases of the process, as operational tool to be included in the planning methods kit II; it has been specifically used for a series of design game sessions.

[37] Interior Design tool.
[38] Antique dealers, glaziers and upholsterers for sacred objects and ancient furniture.

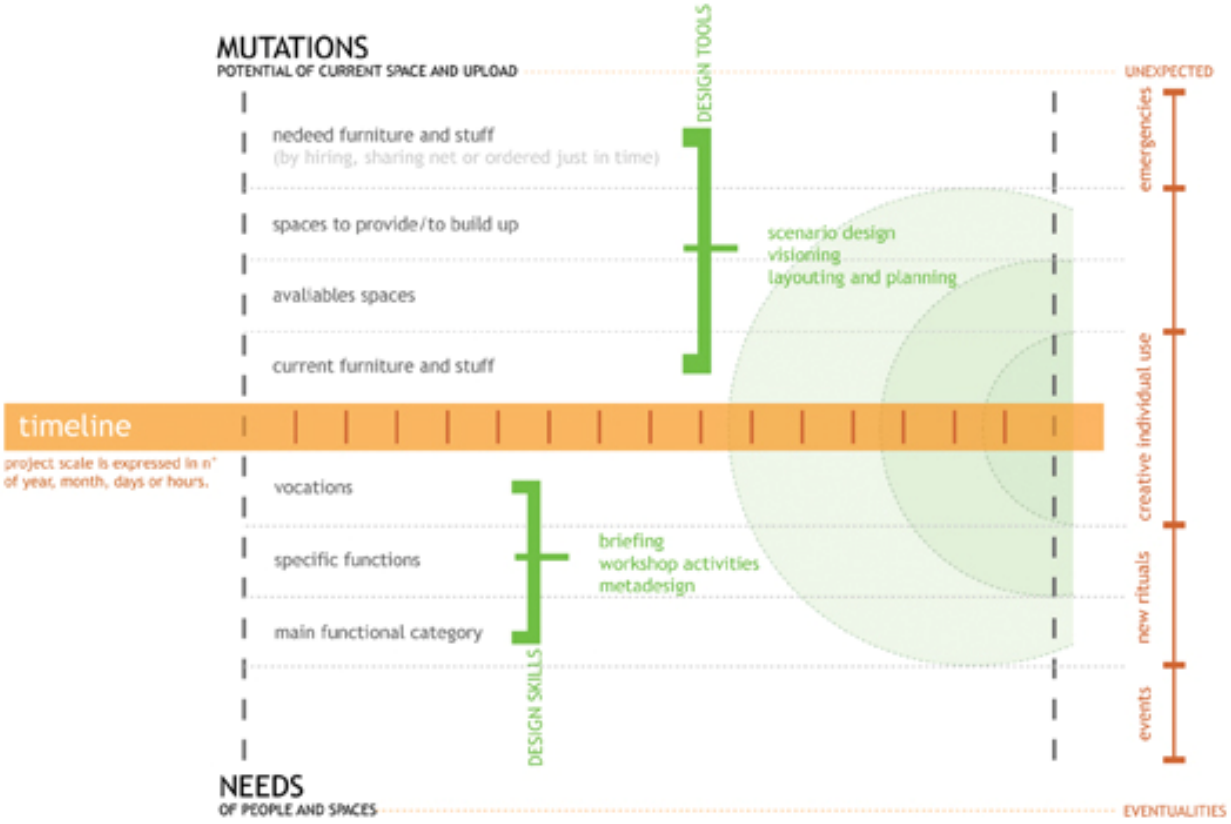


Fig. 2: Example of Real-time layouting diagram (not filled with project data). Design may develop not only a *mindstyle* but also a precise *tool* for the interior designers involved into participatory processes for the conversion of buildings.

Its first strength is the ability to carry out an efficient analysis. The tool is designed to **support the phase of 'listening',** considering various levels of input-data: functional needs, imaginary/representation of a place (object of conversion), shared values and built up visions. Consequently, the outcome in giving priority and evaluating current resources and future design needs would be guided by ideas. Real-time layouting is a tool capable of collecting data deriving from a listening activity which is more careful to interaction with inhabitants (this represents the shift from the quantitative phase, where the assessment of needs takes place, to the qualitative and performing one): this tool has therefore been used to define collective needs. In particular, in order to support this theory, we would like to mention an Outreach[39] experience, which has taken place in Milan, in the **Mazzini neighbourhood;** during the "briefing collection" process, the inclusion of a designer in the team operating in the area has proved to be useful. The regeneration of the Mazzini neighbourhood is part up a wider plan called Five Contracts[40], a process of re-qualification of residential areas. The action potential of the above-mentioned political tool[41] seemed to be adequate for the research topic. The Municipality of Milan, together with Aler are the proposing actors, linked by an agreement protocol signed in 2004. The stakeholders are: an architecture studio and building company, who are responsible for the

[39] This is an investigation technique of the territory which is used for Community Appraisal. Among the "insiders" it is considered with the metaphor of "courting" because this instrument tents, practically, to go directly to people in places where they live and work.
[40] Those that affect the recovery of housing areas in: Gratosoglio, San Siro, Calvairate-Molise, Mazzini and Ponte Lambro. The funds refer to the call " Neighborhoods Contracts II" and concern interventions of building regeneration, infrastructure recovery and public areas (including green ones), social support. Martini Associates Ltd. (http://www.martiniassociati.it/ita/chisiamo.html) is the company charged by the Municipality of Milan for the management of plan.
[41] Or the Neighborhoods Contracts, as complex program. These contexts are privileged occasion for the introduction of innovative factors about local equipment.

realization of re-qualification actions; the inhabitants[42]; social workers that operate in the area (psychologists and educators; cultural mediators and facilitators).

Fig. 3: Photo of the working team, during an Outreach. The AR is part of a process driven by *Laboratorio di Quartiere*, Mazzini district - Milan.

Real-time layouting has a second potential: it is a **global management tool** the designer can use, as it connects the needs and representations of the collective-committing[43] subject to already existing resources (settlement), but above all to what is "new" and must be co-designed; making everything easier to be read and communicated to the non-experts. Such premises allow a wider employment of the tool, in function of the interpretation the community-outsourcer gives of "participation", in regards of available resources. **"*I have a dream:* Cisternino 2020"** is the slogan of a participatory process in Livorno, which has provided the opportunity to check the capabilities of this tool in a different context. The project, proposed by the Livorno[44] Municipality, is a participated design process for the recovery of an historical building located in the city center: the Cisternino in Guerrazzi Square. The process is structured in four phases: the first one foresees the creation of an Organizing Committee, responsible for guiding the launch of the process and guaranteeing positive participation; in the following phases, the city is the main actor of the exploration, proposal and decision-making actions. The administration, the citizens, the facilitators and technicians are involved at different levels of the process. Our focus for this research is on the phase "La città propone" ("the city proposes"), where the younger citizens[45] of Livorno have been invited to take part in a session of Open Space Technology. The goal was to propose and discuss ideas and projects for the re-use of the former Casa della Cultura; the program was called: "*Che Fare nel Cisternino di città dopo la ristrutturazione?"* [46] . The participation of a technician-facilitator in this meeting could be very useful for the interaction itself:

[42] Sometimes organized in Associations.
[43] Or the briefing collected during 'listening' phase and future search; in add, activity 'visioning' (if performed).
[44] Coordinated by Marianella Sclavi, professor of Urban Ethnography at the Politecnico of Milan, and Susan E. George, chairman of degree course in Public Communication and Social Entrepreneurs at the University of Pisa; they are both expert in communication field and experimenting with new forms of participation. For details, see the site about process. (http://cisternino2020.comune.livorno.it/)
[45] Of all ages!
[46] "What to do within the city's Cisternino after its restoration?".

during a collective brainstorming process on the reuse of the building, a professional able to drive popular debate toward a progressive focalization of design trends, combining them with the vision already expressed by citizens, might lead to the definition of *emic* guidelines for the project.

From the interior designer's point of view, Real-time layouting is a tool which can be applied to some **classical metadesign phases** (as cleared in the table below).

	applied use of RT-layouting for:
consultant methods:	
choice catalogue	* *briefing*
field methods	
community appraisal	* *briefing*
Parish maps	
OST	* *trends and potential vision* | *guideline for project*
Priority Search	* *trends*
Future Search	(this technique is already considered in the diagram as a disciplinal tool)
Community Visioning	(this technique is already considered in the diagram as a disciplinal tool)
planning methods I:	
Action Planning Event	
Planning for Real	* *mission and concept* | *guideline for project*
Strategic Choice	
EASW	* *series of concept* | *guideline for project*
microplanning or *CAP*	* *mission and potential concept* | *guideline for project*
planning methods II:	
Pattern Language	
Design Workshop	* *series of concept*
Design Game	* *concept and potential layout*
Building Design & Conversion Kit	* *final layout*

The diagram can be filled out with a variable degree of accuracy; according to a different applicative goal (of data collection, concrete planning and design) in regards of the phase of the process and in function of the methodology behind its use; finally, in relation to the nature of the outsourcer-collective. This will consequently combine with other disciplinary instruments which are typical of a designer, such as: cognitive maps and images/scenarios, moodboard and storyboard, plans and tridimensional models, catalogues and chromatic/material samples. Briefing collection, resource analysis and priority, timeline and mock-up of the process/project: we can say that Real-time layouting is the link with the system of procedures carried out during the participated process and becomes an implicit and explicit tool, i.e. addressed to technician (interior designers) and at the same time functional for the collective decision-making process.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

THE MANAGEMENT OF DESIGN AS A TOOL FOR CULTURAL CHANGE LEADING TO SUSTAINABILITY

A case study in the Industrial Company of Pernambuco, Brazil.

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Abstract

The concern with organizational culture regarding sustainability is justified in relation to industrial production using the binomial: consumption versus market. The issue has also entered the agenda in discussions of design because design is considered an important agent for changes in society's habits of production and consumption. Against this background, we set out from the following premise: because it performs a strategic role in the relationship design-company-market, the management of design has the ability to provoke consistent changes in organizational culture as it uses design tools to optimize productive processes and products. The results of the research study point to transformations in organizational culture in favor of a sustainable relationship with the internal and external environments of the company.

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1. Introduction

The issue of sustainability has entered the agenda in discussions of design in a rather peculiar way, it being considered an important agent for changes in society's habits of production and consumption. This responsibility which is attributed to it is fundamentally anchored on its intimate relationship with material culture.

The concern with the organizational culture of companies as a way of bringing about satisfactory results with regard to sustainability is justifed to the extent that what becomes evident is the relationship between the current forms of capitalist logic which involve the binomial: consumption versus market and its mechanisms, besides the result of astounding progress. Further, in global discussions on the issue, some problematic situations are pointed out such as, among other factors, polluting production processes which equally degrade human life and which are directly associated with the logic of the indiscriminate consumption of industrialised goods by society.

Nevertheless, in order that design may contribute consistently to changes in this scenario what is needed is for there to be an appropriate management methodology for design which will make it possible to raise the awareness of the company to the use of this tool and so to generate a sufficient opening for innovation based on sustainable development[2], states Kiss (2005). Thus we believe that the objective and subjective relations worked on by design can be adequately dealt with in the business environment.

As part of the result obtained in a master's research study which is being undertaken in the Post-Graduation Program in Design at UFPE (Federal University of Pernambuco – Brazil), this article sets out from the following premise: because it performs a strategic role in the relationship design-company-market, the management of design has the ability to provoke consistent changes in organizational culture because it makes full use of design tools in order to optimize productive processes and sustainable results with regard to markets and their consumers.

Along general lines, it is also believed that the management of design should be positioned in a strategic, coehesive and structured way within the organization, since it is charged with coordinating the design actions which occur in and for the company. Thus, it is believed that it will be able to influence the culture of the organization, by directing itself towards stimuli to constant innovation, by making full use of design tools which seek to sensitize and potentialize parameters of sustainability regarding productive processes, the market and consumers (MARTINS, 2004 and TEIXEIRA, 2005).

In searching for evidence that may corroborate this claim, the case study methodology put forward by Yin (2002) will be used and illustrated, in the case of the partnership between the Pernambuco Imaginary (an extension project of the Department of Design of the Federal University of Pernambuco) and the Companhia Industrial de Vidros de Pernambuco (Industrial Glassware Company of Pernambuco) – CIV (in Portuguese).

CIV has been active in the market of glass packaging for food and pharmaceutical products since 1958 and only in the year 2000, did the Company begin to act in the sector of domestic utilities for classes C and D and only from 2003 has it inserted design into its strategic planning.

With the insertion of design directed towards the line of domestic utilities, the challenge was concentrated in adding value to CIV products, by allying the technology used by the company (IS – Individual Seccion[3]) to the needs and wants of its potential consumers.

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[2] On sustainable development, Kazazían (2006, p. 8) conceives it as being "that which reconciles economic growth, preservation of the environment and improvement of social conditions".

[3] Technology which presupposes the conformation of a superior termination in all products as support to the withdrawal of this from the line of production.

The course of the path of this partnership, with its successes and difficulties evaluated in the interaction of design-company-market, brought about organizational changes, which were instituted so as to facilitate and bring out the potential in the reach of this strategy within and without the environment of the organization.

The results show that, the greater the boost from the management of design to innovation, the greater will be the transformations in the company's organizational culture in favor of its capacity for invention. Therefore, the increase in the company's performance reflects a sustainable relationship in the environments internal and external to CIV.

2. Industrial Production and Sustainability

Consumer goods industries almost always deal in a market of cut-throat competition and demanding consumers. As if it were not enough that this competitve backdrop has been intensified by the state of a globalized world, the historical record of world industrialization has brought the burden of decades of indiscriminate use of the environmental riches and of degrading forms of production. According to Ferreira (2003), this scenario was encouraged by the practice of the market in meeting the needs and wants of the population while the reconstruction was underway of a Europe devastated by the Second World War. This phenomenon gave rise to the then consumer society, avidly seeking new experiences and a fertile field for "justifying" progress. Currently, these and other countries located in the central economies, faced with years of devastation and technologies that pollute, are grappling with the need to contain the levels of production.

As a counter-point to this, the peripheral countries are also causers of large indices of environmental pollution and one of the factors which aggravates the threat to the environment is the fact that they are in the shadow of the technology generated in the central countries and are consuming obsolete productive systems and processes which are moreover very harmful to the eco-system (FERREIRA, ibid.). The sum of all these phenomena leaves us no option other than to change habits and models, not only of production and the use of raw materials of both economies, but also of their attitudes when faced with the market and its consumers.

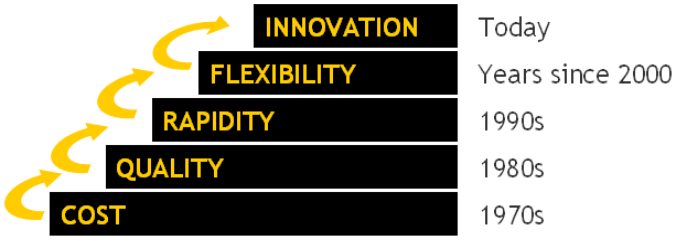
Focus of the Undertakings – a capitalist behavior

At the height of the 60s and 70s, companies' tactics consisted of simply enlarging the offer of products on the market through increasing production. At that time, there was the stimulus to supply the internal market with low-cost products and with little concern for differentiating themselves from each other. At that point in time, when industrial consolidation was starting, the reality of the age was that of low competitivity between companies which, consequently, did not deal with innovation or even did not feel the need to innovate in products for the market. (MORAES, 2006). Even the multinationals set up in Brazil kept their best products for the external market, leaving in this country what was not to the refined taste of European and North American consumers, or what in these markets had already become obsolete.

Now, from the year 2000 to date, companies have been experiencing organizational changes targetting flexibilization of their productive and bureaucratic structure and pursuing constant innovation. It is worth mentioning that the concept of technological innovation to which this article refers also displays changes in the behavioral and methodological paradigm and which, according to Cabral, Tabosa, Tschá and Cavalcanti (2007):

> [...] deals with the set of knowledge and scientific principles which are applied to a given branch of activity that is, their amplitude extrapolates materiality, having the function of giving shape to a specific body of knowledge which accentuates a given ability [...].

Fig. 01: Strategic focus for capturing opportunities by enterprises.



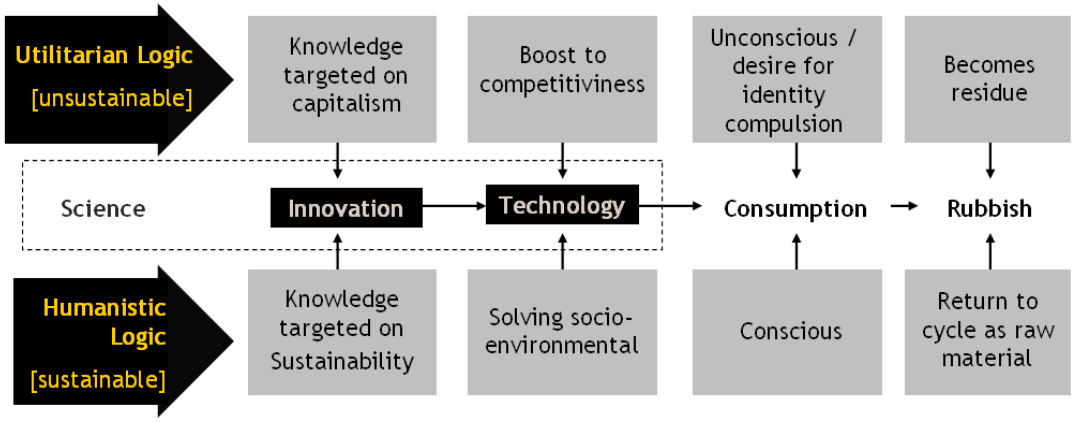
Source: IBIE, 2007.

It is also important to remember that the practice of these companies almost always concentrated on capitalist interests, that is, on the utilitarian logic of increasing profits and without much concern for for environmental and social issues. However, Teixeira (2005) points to the changes in the behavior of consumers, demonstrated by elevating their degree of demand and their level of awareness of issues, and by demanding the restructuring of organizations by means of a development based on sustainability and on a positioning which needs to be more and more innovative, This new level of awareness which is formed has its strength in humanistic logic, which seeks to direct developement which is centred on adding value to socio-economic and environmental matters.

Both forms of logic have innovation and technology as their spring-boards. However, while the former does not display care for socio-environmental aspect, as it incites giving a boost to unconscious consumption and generates residues which become mere rubbish, the latter seeks to raise the awareness in society at large of indiscriminate consumption, as well as of re-using residues as raw material of other or the same produtive processes.

Figure 02 shows the utiltarian and humanist forms of logic, and displays the type of development which each of them assumes as based on technology and innovation.

Fig. 02: Logic of development.



Source: adapted from Kazazian, 2005.

For utiltarian logic, innovation and technology focus on competiveness without much concern for the consequences of production and consumption of all these industrialized goods. While in humanist logic, one sets out to generate a sustainable culture of production, market and consumption, capable of provoking a consistent transformation in the habits inherent in this cycle.

It is worth mentioning, moreover, that the variable of science is presented here as the cradle of the relationship of innovation/technology by the fact of our dealing, in this article, with a case study on the partnership of university/company. However, this same relationship can occur, in other forms, not necessarily containing science as the inductor. It will depend on the modality of the partnerships established for developing new technologies.

3. Organizational Culture as the Port of Entry for Change

For Laraia (2006) and Santos (2006), it is important to bear in mind the power that culture exercises over individuals and groups, since it is one of the reception and transmission channels of visions of the world. It can also be read as one of the motivational factors in the decision-taking and attitudes of individuals, groups or even nations. Therefore, it should be understood as the "*back-cloth*" to changes, conflicts and other forms of behavioral expression.

It is important to understand that culture is not sealed off. On the contrary, it possesses its own dynamism which can be further influenced by various contingent factors, of a political, religious, technological, environmental, economic or social stamp.

For the purposes of study, it is common to observe culture by separating its aspects into material and immaterial. In the first case, we have the symbols, values, beliefs, myths, ceremonies, shared histories, tradition, languages and habits, and so forth. These translate some of the subjective relationships established "between" individuals "and" societies and "from" indivídual "to" society. As to the second, what can be cited are the norms, rules, established procedures, architecture, technology, visble and physical objects, etc, which represent, in the form of artefacts, these same relationships.

When we deal with organizational culture, we speak of the essence of the organization and that it may possess its suas nuances both of material and, above all, immaterial culture This, whatever the changes aimed at for the company may be, it is is necessary, first and foremost, to consider its cultural character.

According to Cardoso and Cunha (2001, p. 91), "*the organizational culture is the phenomenon which most expresses the institutional dimension of the organization: the order, the structuring function which produces subjectivity and models behaviors*". Further, according to

these authors, these structuring functions are responsible for producing "*perceptions, attitudes, values and behaviors, which, for their part, are synthetized into an organizational ideology and into predominant collective behaviors*".

What is is clear, therefore, is the power and influence which organizational culture exercises, not only on the individuals of the organization but also on macro society [4] of which it forms part.

According to Motta and Caldas (2006), the finality of organizational culture is to promote the company's survival, for which it is divided into having two distinct purposes: the first, of adapting itself to the external medium, such as to the market, to the business environment which includes the economy and to the relationships of networks external to the organization; and the second, for its part, aims to provide the organization as a whole with internal coherence.

In an interview with the magazine HSM Management, the buiness leader Jorge Paulo Lemann, one of the partners of InBev, talks of the importance of having organizational culture as his ally for consistent and long-lasting changes in the current globalized market. Lemann speaks of his experience of working on management culture, more precisely, fostering touches that encapsulate Brazil while managing his enterprises, which, so he claims, have shown thmselves to be a good strategy for the prosperity and sustainability of his businesses and the [environmental, social and economic] medium in which it is placed (SALIBI, 2008, p. 14-24).

In the same way, for changes in the marketing context, into which clients and their current habits of consumption are inserted, it is important to work on the culture of the organization by means of actions which target this environment, such as innovation of productive processes and of products, for example. Under this focus, design can be inserted in a direct way, through creative solutions which ally the efficiency and productive effectiveness of products to use and discard of those products last thought about when they were conceived.

4. Management of Design and its Field of Action in an Industrial Environment: stimulating change

Companies currently need to deal with the constant threat of new products and competitors who increasingly set out to meet or even stimulate the needs of consumers. In this dynamnic scenario, it is no longer possible to avoid the process of innovation. On the contrary, the exercise of generating innovations has practically become a *sine qua non* and not only to take advantage of those of others', since reactive postures alone are no longer sufficient for industries to survive in the globalized market. Therefore Brandão and Gonçalves (2006) are hard-hitting when they state that: "*the ability to innovate gains preponderant importance in defining who will prosper or succumb"* in the global business scene.

Nevertheless, to innovate is not only to invent or simply to discover. Innovating, necessarily, ends in a cycle where something is, finally, created, implemented. If referring to innovation through design, and he could well expand the concept to other areas, Teixeira (2005) states that inovating deals with the process where design "*practises a new idea, transforming it into an effective action*".

Therefore, design is positioned in a direct connection with the competitive adaptation of companies to the market in its temporal and physical conetxt, by means of its ability to transform the subjective and objective elements of this context into new products, processes and/or services, it being an important agent for sustainable development, as Mozota (2002) argues.

It is through the movement around innovation that design finds space to insert itself into the company and incites changes in its organizational culture. This relationship can be understood as

[4] Society in which the organization is inserted, such as country, State, town, neighborhood or also, religious and political groups and/or economic segments, and so forth.

one of “projecting for change”, since design (ONO, 2006), through channels, tools and abilities, exercises influence on the macro culture[5] and, consequently, on the trends of consumption.

Nevertheless, it is important to understand that the complexity of design goes beyond differentiating or innovating products or brands and its correct management within the company becomes fundamental for the success of these projects, as Kiss (2005) says when he states that:

> [...] design needs a methodology just as all corporate activities do. Processes should be created to guarantee that design is consistent and meets the standards of quality and innovation, in the same way as effective structures of management are necessary to guarantee that design [...] is integrated correctly with the other corporate activities.

The Management of Design and its Levels

Some authors separate the management of design at the operational, tactical and strategic levels. At the same time, no matter that in some moments it acts with greater intensity on one of these aspects, the three are component parts vof design itself and, consequently, inseparable in practice.

The operational level is reponsible for the conduct of project designs in themselves. However, depending on the opening that the management of design at the operational level has, it may influence the company strategically, when it takes the decision to innovate in raw materials or even in suggestions for changes to productive processes, for example.

The tactical level is answerable for the coordination of the design actions which occur in the company, by mobilizing material and immaterial resources and making them available so that design strategies are fulfilled in an eficient and coherent way and meet the company’s objectives.

As to the strategic level, it can be understood as the highest level in which design participates within the company since its decisions impinge directly on the future paths of the enterprise itself.

Table 1, below, shows these three levels, their respective fields of activity, the creation of value from the management of design in each of them, as well as the influence of design.

Table 01 – Influences of design on the Management of Design

Management of Design			
Levels	Activity	Creation of Value	Influence of design
Operational	Actions targeted on the design project. Considered a task from ‘within to without’ both in style of intellectual conception and functional simplicity (European) as well as so that serves for sales and advertising (American).	Creates value on what the company supplies	On the corporate image and product: gives sense to the discourse and object.

[5] Culture of society in general which can be affected by the actions of the action in a direct or even indirect way,

Tactical	Occurs on the coordinating function of the design project, i.e. the function of control falls to it.	Creates value on the support functions, in particular on the management of innovation and technology.	On people: helps to mobilize and motivate by the facility of circulating information, by drawing close to different actors of the process.
Strategic	Assumes responsibilities for the evaluation of the company's mix of products, by checking its performance and seeking new possibilities regarding products to be produced by the company.	Creates value on the business environment or transforming function of design.	On the company: facilitates the formulation of a project which boosts the vision of the strategic nucleus.

Source: adapted from Martins, 2004, p. 99.

In general, the mangement of design should seek to act at the level closest to the strategic one so that the actions of design in the company can be brought to realise their potential. Thus, it will be possible to influence organizational culture, by targeting ways to stimulate constant innovation and by making full use of design tools which seek to raise the company's awareness of the parameters of sustainability regarding the productive processes, market and consumers (MARTINS, 2004).

According to the CPD - Centro Português de Design (Portuguese Center for Design) (1997), the management of design should be positioned next to the sectors of marketing, engineering and production, thus making it possible that this network may communicate efficiently and effectively during innovation processes.

This position when added to the correct management of communication of these and other sectors in the company confers on the management of design a favorable opening to changes in and breaks of paradigms. Nevertheless, for design, this interaction is made all the more necessary in the departments mentioned, since, according to Ferreira (2003), these are responsible for:

- **Engineering and Production:** working on the technical and technological aspects of the product and productive processes;
- **Marketing:** determining the briefing for creating new products and for decisions of the type: "what is there to be done", i.e. it manages to achieve new possibilities for products and markets.

It is worth underlining that breaks of paradigm of the technological type can also come from marketing stimuli, when this identifies, for example, a new opportunity for a product. In the same way, breaks of paradigm in products and marketing devices can also come from engineering and production.

Emphasizing this need for interaction, in an interview with the magazine AMANHÃ (Müller and Graciano, 2005), Professor Celaschi of the Polytechnic School of Milan points out that it is by the union of forces of all agents and departments involved in the process of innovation, by means of good communication, inter-relationship and awareness of each on their roles and objectives of the projects that the company will manage to attain good results, thus facing less risks and optimizing productive processes.

5. Methodology

In the search for evidence that may corroborate the central premise of this article, the methodology used to develop the research is that of a case study as proposed by Yin (2002). As the main unit of analysis, the experience undergone in the Companhia Industrial de Vidros

(Industrial Glassware Compnay) – CIV – will be presented since this firm has been demonstrating gradable results and since they prove the influence of design and the management of design on its organizational culture.

The partnership with the Pernambuco Imaginary, an Extension Project of the Departament of Design of the Federal University of Pernambuco, in 2003, was one of the company's first experiences in the use of design with the initial objective of differentiating the products of the Company on the market.

The course of this partnership shows, however, that other relationships were established as a way to meet strategies centered on deign. The case sets out to give a succinct report of this experience, and emphasizes phenomena which prove the influence which the mangement of design can exercise on the organizational culture of a company and, thus, obtain more satisfactory results regarding their sustainability.

The data which will be presented in the description of the case were collected from semi-structured interviews, gathering documents, and in conversations with members of the Pernambuco Imaginary project. These results also form part of a a master's degree research study of the Post-Graduate Program in Design at the Federal University of Pernambuco, the theme of which focuses on the management of design for industries producing utilitarian products.

6. The Case of the Companhia Industrial de Vidros (Industrial Glassware Company) - CIV

Founded as a family business, the Companhia Industrial de Vidros - CIV forms part of the enterprises of the Cornélio Brennand Group and has been active in the glass packaging for food and pharmaceutical products since 1958, and has reached the ranking of being among the top three national industries in this sector (CAVALCANTI, 2006).

The company possesses 4 manufacturing units in the Northeast of Brazil, which supply it with the capacity of 07 fully installed kilns and permits the production of 1,000 tonnes of glass a day i.e. 1.5 billion units/ year. In the year 2000, with the aim of expanding its business, the Company entered the market of domestic utilities for social classes C and D, a line which currently responds for 20% of its annual turnover.

Surveys conducted by specilized bodies. Such as IBGE – the Brazilian Institute of Geography and Statistics - reveal that the volume of purchases by CIV's target public (C and D) has been increasing considerably. The results point to scales of advance in the order of 9% only in 2006, almost double the growth of the total consumption of the population. When class E is added, the three bands represent 31 million Brazilian homes, i.e. 72 out of every 100 urban households, and together they detain the purchasing capacity of 372.5 billion *reais*, the equivalent to 42% of national consumption (BLECHER and TEIXEIRA, 2003), that is, the market scenario in which CIV is active demonstrates great opportunities both in the economic sphere and in a fruitful environment for the institution of changes in the habits of consumption.

CIV and Design

It was by gambling on innovation and on incremental and even radical changes in its model of doing business that CIV, in 2003, began to invest heavily in increasing its productive capacity and in differentiating its products through design. From this same period, CIV also began the phase of transition from a family company to a company managed by professionals from the market.

One of the company's first contacts with design came about as the result of an external consultancy, through the Pernambuco Imaginary extension project, of the Department of Design

of UFPE - the Federal University of Pernambuco. In this project, students and teachers began to develop new products for CIV's domestic utilities line such as cups, jars and pots, and had the initial challenge of making the technology used by the Company compatible with the aesthetic and ergonomic requisites, including those of usability, of these products demanded by the consumer.

The greatest obstacle of this challenge is concentrated on the fact of the IS - individual seccion[6] technology, used by CIV, being the proper equipment for the production of glass packaging, which implies, necessarily, conformation of a superior finishing in all the products which it serves as support in order to withdraw these from the production line.

In addition to this finishing interfering visually in the aesthetics of the product, in some cases, it can also interfere in their usability by the end consumer, or even in the productivity of the company, when poorly dimensioned.

Other issues also referring to technology can affect both the usability and the ergonomics and aesthetics of the product, such as, for example, the type of conformation of the glass walls of the product. By the fact of the technology used being of the type blow-blow[7] or press-blow[8], there is no means of having total control on the distribution and quantity of glass on account of the shape of the product. This characteristic can provoke failings in the production process which can be perceived by the end consumer as a factor of the product's low quality.

Design Methodology for Developing CIV Products

Figure 03 shows the methodology used by the Pernambuco Imaginary to develop products for the line of domestic utilities.

[6] Type of pneumatic machines commanded mechanically or electronically. This type of equipment is created for the production of glass packaging in the blow-blow and press-blow processes.

[7] The blow-blow process begins from loading the gob of glass, at a temperature around 1200º, inside the pre-mould which receives an injection of compressed air and forms the neck.

[8] The press-blow process offers more flexibility in the conformation of shapes for the product, thus making a greater variety of glass pieces possible. The drop of glass inside a pre-mold, is now on a pin, which will press the glass against the bottom of the pre-mold. The extraction of the piece is similar to the blow-blow process.

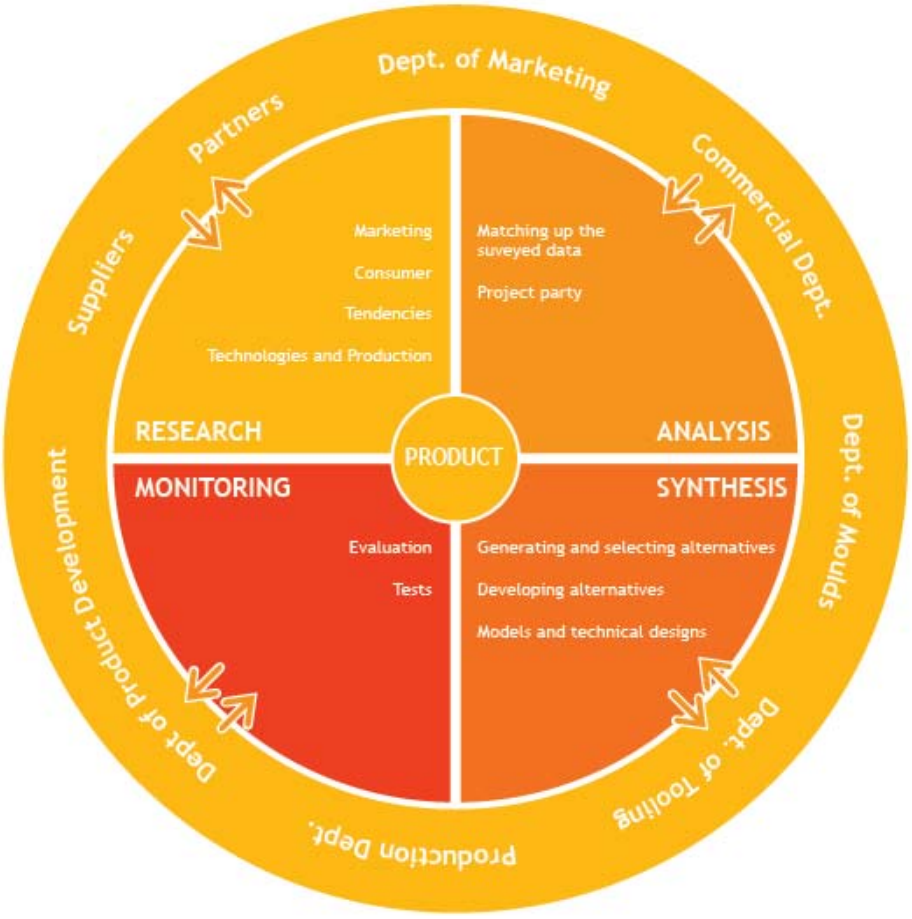


Figure 03: Methodological steps for developing new products.

Source: Cavalcanti, Andrade, et. al, 2007.

In the macro steps which the figure above shows, we can note that the Pernambuco Imaginary Project establishes several relationships with the departments of marketing, production, CEO (directorate), suppliers, consumers and, depending on the complexity of the project, these relations are widened to other agents and also intensify.

In general, the methodology begins with the briefing, formated by the marketing department, in which the background[9] of the product to be developed, and moreover its target [10] appear.

The following steps on receipt are, respectively:

- **Survey:** the phase in which [i] information is collected on the technical project limitations together with the engineering and production departments, [ii] the market surveys are carried out, such as looking for similar ones on the market and the positioning of competitors, in addition to [iii] direct surveys with the potential consumer of these products.

[9] Type of historical record in the company and its relationship with the market; the objective, which involves the characteristics of "utility and significance" of the object and its targeted positioning (CAVALCANTI and ANDRADE, et. al, 2007).

[10] Syntesis of the consumer's profile which includes information on gender, age and social class (CAVALCANTI and ANDRADE, et. al, 2007).

- **Analysis:** step relating to the formulation of the project party based on de-codifying all the information obtained in the previous steps, since the briefing;
- **Synthesis and Ongoing Monitoring: the last step in developing products deals with selecting and enhancing the alternatives chosen, by the company, to be launched on the market. This phase sees the start of the technical detailing of and ongoing monitoring of the project until it is inserted onto the market.**

It is worth mentioning that the management of design which occurs in CIV is still at the operational and tactical level. Nevertheless in certain projects, it was possible to observe that some strategic level solutions started out from design stimuli.

Organizational changes Arising from the Action of Design

Given this model of partnership on account of the innovation in design, the Company has been displaying transformations in its organizational culture with regard to innovation, concern for the needs and wants of the consumer, the search for sustainability in its three parameters, as well to constant adaptation to the market.

Table 02 shows some of these changes and their respective influences on the organizational culture.

Table 02 – Organizational changes and their influence on the company's culture.

Change perceived	How it affected organizational culture
Improvement in communication between the sectors of marketing and engineering	Increase of efficiency in the flow of development of new projects.
Increase in the capacity of innovation, since, currently, the company is allowed to run greater risks because of the better positioning for its product.	Better adaptability to the market and meeting the needs and wants of consumers, in some moments, by behaving in a proactive way in the segment of domestic utilities.
Increase of the stimulus to the creative capacity of its staff. For, in each project, the participation of various stake-holders in the company is encouraged to find solutions to project problems (CABRAL, et. al. 2007).	Sustainability of the society internal to the company and, consequently, of the internal and external economy, since this type of functioning brings greater capacity for generating innovations.
Increase of the perception of value on the product by the end consumer arising from re-structuring the company and its corporate image, with a view to adapting itself to this new perception (CAVALCANTI, 2006).	The change in the company's internal behavior, i.e. in its identity, generated the need for adapting the corporate image so as, once again, to adapt itself to the market.

Source: creation of the authors, 2008.

7. Conclusion

The Pernambuco Imaginary Project has contributed to CIV at the R&D – Research and Development – levels, by prompting innovation in the company and the gradual absorption of design by the organizational culture. Therefore, many changes arising from the actions of design were realized, such as the greater interaction among sectors involved in the devopment process

for new products, thus permitting innovation to meet more efficiently and effectively both needs of the business but also of its consumers.

As the focus is applied research, the risks inherent in innovation are reduced in addition to which it is possible for the company to estimate rapidly the performance of the product on the market. This factor confers a certain degree of reliability in the strategy of innovation centered on design.

It is also perceptible that, despite occurring in a gradual way, and even though management of design at the strategic level in the Company has not yet been instituted, there are signs that these projects indicate a path is being constructed so that this may come about.

Given, therefore, that the influence of the management of design has gained fame, even if at the operational and tactical levels, in the CIV organizational culture, it is possible to state that the greater the opening up and stimulus of the management of design to innovation, the greater will be the inventive capacity of Brazilian companies and, consequently, their performance in the global market.

Management of design and innovation when integrated bring out the potential of actions on organizational culture in order to obtain and propagate satisfactory results in the market with regard to the general sustainabiity of the company and its physical, economic and social surroundings.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

COLLABORATIVE SERVICES AND MOBILE NETWORK

Observation of social innovation and anticipation of sustainable lifestyle in China

Miaosen Gong[1], Shu Feng[2], Chakrapipat Assawaboonyalert[3]

Abstract

The paper reports the observations of some emerging grassroots social innovations in China as collaborative services and the anticipation of Chinese visions of sustainable lifestyle specifically in the perspective of mobile network.

By case studies, the paper starts with a discussion of bottom up initiatives of sustainable lifestyle in China in comparison with European experiences. Moreover, the characteristics of collaborative services in China are identified in the terms of service structures, contents, motivation, social context and so on through a series of research activities like interviews and seminars. In the second part, the relationship between collaborative services and mobile communication is investigated in two aspects: MCTs(Mobile Communication Technologies) supporting contexts and MCTs enabling solutions by case studies of MCTs creative services and applications.

In a word, the paper puts in evidence that mobile communication and networks have specific qualities to enable the collaborative services.

Keyword: Collaborative service; Social innovation; Mobile network; Sustainable lifestyle; Case Studies

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Social Innovation, defined as “innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organizations whose primary purposes are social.”(The Young Foundation 2006, 11), has been widely discussed in the field of civil society and is becoming a new wave of human evolution since our environmental and social problems are growing all over the world much larger and faster than what other innovations in technologies and businesses can deal with. Given that, social innovation could be a strong driver towards sustainable society.

Social innovation happens in different domains and by different approaches. What we inquire here is a specific type of social innovations, those grassroots social innovations in everyday life, known as Creative Communities[4] (Meroni 2007) and Diffused Social Enterprises, where the collaborative services are implicated.

Cases of creative communities towards sustainability have been observed in Europe[5] (EMUDE 2006) and worldwide (CCSL 2007). They are bottom-up emerging initiatives that illustrate the real possibility of reorienting the evolution of present society in the direction of a sustainable knowledge and network society (Manzini, Jegou 2003). Therefore, promotion of this kind of social innovation could be a viable strategy for sustainable development and in this transition strategic, design approaches are supposed to play important roles as a social learning process. Furthermore, the collaborative service was abstracted from the observation and study of cases as a new typology of service evolved from diffused social enterprises. Therefore, to promote the creative communities or their initiatives towards sustainability means to promote the collaborative services.

As mentioned above, sustainable society inclines the network society and involves the social network, which have been enhanced and diffused by information and communication technology (ICT). Furthermore, Mobile communication extends and reinforces the technological platform of the network society and diffuses the networking logic of social organization and social practice everywhere, to all contexts - on the condition of being on the mobile Net (Catells et al. 2006, 258). Then the following question is how Mobile Communication Technologies (MCTs)[6] support the promotion of collaborative services.

The aim of this ongoing research is to investigate collaborative services implicated in social innovation in China and the potentialities of MCTs as enabling system in the transition of sustainable society. This paper is an intermediary result of the first stages of the research, which is based on some activities including the promising cases collection and analysis, interviews, a seminar and a design exercises with supports from local partners and research network in China. It consists two parts. First part is to study Chinese cases of creative communities and local contexts of social innovation in comparison with the experiences of Europe; the second part is to have a pilot observation and discussion on the possibility and the way ICTs support collaborative services in the context of China.

[4] Creative communities: groups of innovative citizens organizing themselves to solve a problem or to open a new possibility, and doing so as a positive step in the social learning process towards social and environmental sustainability.

[5] For instance: groups of people who re-organize the way they live their home (as in the co-housing movement) and their neighbourhood (bringing it to life, creating the conditions for children to go to school on foot; fostering mobility on foot or by bike). Communities that set up new participatory social services for the elderly and for parents (such as the young and the elderly living together or micro-nurseries set up and managed by enterprising mothers), or new food networks fostering producers of organic items and the quality and typical characteristics of their products (such as the Slow Food movement, solidarity purchasing and fair trade groups). (For more, and more detailed, examples see: http://www.sustainable-everyday.net/cases).

[6] Also named wireless communication technologies.

Collaborative service, Mobile network and China

Collaborative services and design

Collaborative service is a new typology of service to be distinguished from general service. It is generated by a group of people, creative communities or diffused social enterprises who collaborate in the co-creation of commonly recognized values (Manzini 2008). Most of promising cases indicate a common characteristic: clients and agents of service system are interwoven or totally overlap since the solutions are based on a cooperative approach (Cipolla 2006). In some cases of communities supporting agriculture, the clients are involved into production as co-producers such as “Jardin du Ceres”[7]; or the actors often switch between clients and agents such as the case “Nurse at home”; While in the case of carpooling or car share, the actors could be totally equal.

It could be found that collaborative service has a different fundamental structure from the traditional service system. They are based on the peer-to-peer, collaborative relationship between actors, which needs the high degree of mutual trust and relational quality. And they call for the direct action by the involved people and are based on their willingness and capacity to act. Given that the contexts of collaborative services are highly complex socio-technical system, as a whole, they cannot be “designed”. So how to promote the collaborative services? In the perspective of strategic design, it also could be designed in two perspectives: contexts improvement and enabling solutions development (Manzini 2008). Contexts improvement means to fertilize the ground for creative, bottom-up initiatives and make it more feasible and accessible to grow the collaborative services. For example, tolerant environment is a necessary and important condition since collaborative services are often radical innovation so that they are beyond of the consideration of traditional system. An enabling solution is a system of products, services, communication and whatever else necessary, to improve the accessibility, effectiveness and replicability of a collaborative service (EMUDE 2006), in another word, to enable it to happen easier in different conditions and contexts.

Mobile communication and social network

Mobile communication has been diffused all over the world faster than any other communication technology in last decades. It really began to take off worldwide in the mid of 1990’s and till end of 2007, according to statistics from the market database Wireless Intelligence, the number of subscribers has reach around 3.3 billions, almost half of World population. In China, at the same time, the number of subscribers had reached 547,286,000 (Ministry of Information Industry of P.R. China, 2008). In this radical change, the mobile phone is not only a portable tool for calling, but also a new lifestyle for connections rebuilding with the collapse of traditional social infrastructure.

Mobile communication extends and reinforces the technological platform of the network society, a society whose structure and social practices are organized around microelectronics-based networks of information and communication. So mobile network society is simply the enhancement of the social structure conceptualized as the network society by new, wireless communication technologies (Catells et al. 2006, 6). It provides unprecedented opportunities for organizing, communications, and service and information delivery. The civil societies and research communities have recognized the significance of mobile communication to social innovations in terms of social benefits, social changes and social impacts towards some particular social problems or context like poverty, war, Aids and so on.

China and Harmonious society

China is one of the largest emerging countries. In the last decades, the fast economic growth has transited the ages from agriculture to industry while this process took western world several centuries. However, the rapid industrialization is bringing out pressing environmental and

[7] Those cases as examples here could be found in our website: http://sustainable-everyday.net/cases/

social problems, and changing the social infrastructure much, which has been beyond of the capacity of traditional system of society and call for social innovations.

A new movement oriented by central government of China is expanding in China---Harmonious Society, a harmonious society should feature democracy, the rule of law, equity, justice, sincerity, amity and vitality (Hu Jintao 2005). Harmonious Society is a concept raised by the Chinese government during the 10th Annual meeting of the Chinese National People's Congress in March of 2005. It tells the big decision of central government to shift from fast economic and industrial development to sustainable development and society. Given this top-down policy and governance. Social innovations are expected to contribute for harmonious society.

Research framework and methods

The research starts from the cases that were collected in EMUDE[8] as a paradigm. The research programme includes two stages, in which different research methods were applied, including desk research, case studies, interviews, seminars and also some field researches:

Stage-1[9]: case studies of Chinese creative communities and their local contexts. With supports of local partners[10] in China, more than fifty promising cases of creative communicates were collected and 18 of them were selected for case studies to address the state of art of collaborative services. 8 interviews with experts, social workers, Professors were organized to discuss the general context of social innovation. Then a seminar was organized to discuss those cases and their implications with participants from civil society organizations, social enterprises and academic institutes.

Stage-2: case studies of creative services and applications of mobile communication. Through desk research, another group of cases were collected worldwide. They are not only the cases of MCT-related collaborative services, but also in general sense of social benefits, impacts, changes and innovations, such as mobile election monitors, mobile communities to share the views and daily experiences, mobile emergency system, mobile banking, mobile microfinance, mobile information services, mobile learning and other mobile benefiting social change on global health, humanitarian assistance, environmental conservation and so on.

As presented above, to answer how MCTs support collaborative services means to investigate how they support contexts improvement and enabling solution development. But first of all, we need to understand what and how collaborative services are happening in China. This is exactly the task of stage-1. It has been found easily that among the EMUDE cases, most of them don't address the explicit specific values of mobile communication. Although almost each case involves mobile communication, the ways of involving is not in the sense of creativity but ordinary. Therefore, in the second stage, new case studies were done to observe what and how MCTs have been involved into social benefits, impacts, changes and innovations in terms of creative services or applications in order to investigate the potentialities of mobile communication. In addition, since mobile communication, being technologies, is universal and not much different between different regions, the cases were collected not only from China but also from all over the world.

Collaborative services in China

Same ideas, different stories

[8] EMUDE - Emerging user demands for sustainable solutions: social innovation as a driver for technological and system innovation 2004-2006 (NMP2-CT-2004-505345) End date: 2006-03-31 Duration: 24 months. Instrument: Specific Support Action). The research Consortium was coordinated by IDACO-Politecnico di Milano

[9] Most of research activities in this stage were organized during the research project CCSL.

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It could be found that most of the service ideas indicated by European cases are also addressed by Chinese cases, such as communities support agriculture, carpooling (PINCHE), purchasing group, co-house, mutual elderly services, mutual neighbourhood, time bank, rediscover of bicycle transportation and so on. They are emerging out actively in the urban.

However, those cases with same ideas have different contents from European experiences. For example, carpooling today is very popular in China but in general it is collaboration between an owner of car and others who haven't cars, instead of between car owners, so the motivation, structure of system, the relationship between actors are quite different from European cases. While they are also collaborative services since the car owners don't only provide services for others and all of them have to be collaborative to generate the common solutions by themselves. Taking group purchasing that has been diffused in China as another example, with the same ideas, the contents and expressions have been largely enriched in Chinese practices. Firstly, it is very popular particularly in the young group and in universities; Secondly, the purchased products and services are widely various from food, fashion to cars and houses; Thirdly, the scale of participants of activities are much larger than European cases. In sum, the service ideas often have local stories and expressions in the contexts of China.

Strong economic motivations

Collaborative services happen with different motivations in general. Part of Chinese cases address that economic motivation is stronger than the motivations of environmental benefits, especially in the cases that have been widely diffused, scaled up and successful diffused social enterprises, such as carpooling, group purchasing and flea market. Since China is still a developing country and the GDP per capita is still low, it's normal to put the economy motivation in an important place.

Through the interviews, participants involved into those cases presented interesting feelings: at beginning they participate mainly for economic reasons, but their activeness is enhanced by collaborative experiences so much that they'd like to keep being involved. It means marketing-oriented collaborative services could bring out a social learning process to increase the willingness of participation and collaboration.

Trust rebuilding

Collaborative services need high degree of relational quality between actors. And it's a big challenge since the credit system in China hasn't been established very well after radical and continual change of social infrastructure in the last decades. However, it doesn't mean people don't want to trust each other. One interviewee said:

"... Today people talk much about the inhospitality of people and society. The warm neighbourhood of the past is like a memory left in our mind. With the change of economy and society, also because of the large and fast movement of population, my generation and the younger generation feel that people are not used to take care of each other as before..."

It indicates a contradiction that they would like to trust each other but they haven't security when they offer trust. Actually, all cases of collaborative services have to face the problems of trust and in general there are two kinds of solutions: 1) to decrease the threshold of trust to generate them. For example, some group purchasing is organized depending on the purchasing activities other than purchasing groups so that it's more flexible to involve it or not any longer. 2) to rebuild the trust in the new service system and it could be rebuilt in different ways: Involvements of enterprises or social enterprises, as credits guarantee, are helpful approaches to rebuild the trust, such as carpooling; Closed Identity certification could also increase the trust effectively, such as flea market in university where they use the BBS as a platform which is open only to the students and staff in their university and they need to register with students identities. In some self-organized group purchasing, they have credit system where participants could increase the credits with their performances of participation; Top-down intervention also works in some cases like elderly association and community services. In a word, since credit system of

entire society couldn't be rebuilt in a short time, it has to rebuild the trust case by case to promote the collaborative services in China.

Social infrastructure evolution

As we known, Chinese social infrastructure has been changing so much during social transformation. Before industrialization, it was based on the families and production units[11]. Since "reform and opening"(80's), the original infrastructure was released step by step. The working and living were departed and new residential communities were mainly reorganized by the means of financial conditions: which kind of houses they are able to buy. Consequently, there are no connects between people who buy houses in the same places, local communities[12]. The social fabric based on families and production\working were weakened much and they have no ideas to rebuild the new social fabric in neighbourhood.

However, our study also reports an opportunity as our interviewees addressed: most of people now still have vivid memories of traditional neighbourhood and communities and they have strong need to recover the social fabric and relational quality in new condition after losing them for some time, no doubts, which is very different and complex. But it is still a good moment to have leapfrog from a traditional social infrastructure to a new sustainable one before the memories are totally lost in the next generations.

Top-down and bottom up

Chinese civil society is a typical case of a civil society led by the government (Yu 2006, 82). For historical and political reasons, China has a particular context of civil society. Firstly, the related law and regulars require all NGOs to subordinate the bodies of administrative or government. Secondly, most of the predominant NGOs were founded by government bodies; Thirdly, most of them have leaders with government background. Fortunately, it has been recognized well that this old system couldn't follow the radical change of society or meet the needs of growing the civil society and grassroots innovation. Therefore, Chinese government started to retrieve the intervention in the field of civil society to encourage bottom up initiatives and innovations. Nevertheless, government still is a very effective stakeholder to promote the collaborative services since it has strong resources and experiences in promotion and replication of good ideas, activities and programmes by top-down approaches, as an interviewee said*:*

" As to the promotion, our government has very established approaches and experience to replicate a model all over country once it is convinced."

MCTs supporting context

The question, how MCTs support collaborative services in China, was investigated by two groups of cases studies. The first group is the cases of collaborative services in China for the question of what and how mobile communication supports the services in general cases now. The second group is the cases of creative services and application of mobile communication all over the world, through them to anticipate the potentialities of mobile in two perspectives. The first one is MCTs supporting contexts.

Ubiquitous and permanent connectivity

In the last fifteen years, mobile communication has been diffused all over the world. It enhances and deepens the social network structure and transforms the human communication as

[11] We suppose there are three mainly stages of communities history since last century. Firstly, before Liberation(1949), Families system is infrastructure of society. The power of government only reaches the "Xian" level and below that, people were governanced by families system. Secondly, after liberation, government management reaches the bottom of society, and families system was weakened less or more. With the movement of " Nationalization"(50's), people were organized into collective communities which is comprehensive small society with functions of production, living, education, entertainment, welfare and etc. more vivid description: it provides all kind of services from your born to death. It's also a stable structure oriented by production.

[12] Here the "community" mainly means neighbourhood.

ubiquitous and permanent connectivity, which provides a favourable physical, external and technical context for collaborative network.

Looking at the promising cases from China or Europe in detail, almost no one can work without mobile communication. On one hand, it tells that involved people have and use the same mobile phones and services as others. On the other hand, it means mobile communication is very necessary to services. In terms of technologies, furthermore, mobile communication technologies and services were developed and diffused for other needs instead of social innovations. However, it unintentionally provides technical conditions and opportunities to the concept, development and management of collaborative services as external context improvement. The second group of cases also indicate those large scale MCT-based collaborative and participative behaviours have a precondition of ubiquitous and permanent connectivity.

Participative social learning process

Those emerging cases of collaborative services often happen in particular local context and on particular people who have willingness and are collaborative to participate the communities and the willingness is almost impossible to be designed as well as collaborative services. The second group of cases indicates that mobile social network based participation experiences, as a social learning process, have improved the internal, cognitive, internal and social contexts for collaborative activities.

Mobile communication and social network have enabled many large scaled participative actions from civic engagement, collaborative m-learning, disaster management to TV program interaction, such as Nasamo in Korea, Mobilevoice in Africa and Supergirl tv interaction in China. Super Girl is an annual national singing contest. Viewers are able to participate in the judging process by sending text messages with their mobile phones to vote for their favorite contestants. Over 800 million text messages were sent during the third season (2007) of Super Girl, and fan clubs began to appear throughout the country. It is considered as one of the largest "democratic" voting exercises in the Mainland of China. Given that Chinese civil society is mainly government oriented, the interaction of voting experiences could be a social learning process to increase the willingness of participation and involvement into collaborative initiatives.

MCTs enabling solutions

If MCTs supporting context is an unintentional result of technology development and application, enabling solution is usually the result of intended design process for the specific service idea. Therefore, how mobile communication supports enabling solutions is manageable and could be anticipated in certain sense. The following discussions are about how it does or could support the enabling solutions for collaborative services in China.

A bridge between virtual and physical world

Given recent hardware, platform development, and Internet connectivity gains, mobile devices are quickly becoming key outlets for social software (Counts 2006, 1). The mobile social software and network brings new opportunities to shift Web 2.0 actions into a physical social world.

Collaborative services are often complex and the more people are involved, the higher degree of complexity it is. Having a look at the first group of cases, most of them have Internet-based networks/communities as coordination platforms for the service system. Till today, mobile phones still couldn’t replace computers because of the limitations of interface and computing capacity so that much coordination work is taken up on Internet. However, in the stages of execution in physical spaces, mobile phones are very necessary and easier communication tools as they are personal, potable, pedestrian and instant. For examples, in the case of PINKE (carpooling), they coordinate everything online for plan and preparation. When they start to act in

a real space, they have to use mobile phone as communication and coordination tools. So do the cases of purchasing group, carpooling and flea market.

Based on above discussions, added extension observations of social network and p2p phenomena that are highly diffused in Internet and have huge social impacts, we find that mobile communication and network is an enabling bridge to lead the collaborative initiatives in virtual communities to shift into a physical world.

Different service ideas and democratic groups

Different service ideas have different ways and potentials to use the mobile communication because they have the different system structure and process that generate different technology needs. For example, in the case of the elderly associations, mobile communication is not very necessary for the coordination of services because they have a place to stay together; in the case of carpooling, the location specific services could be very helpful to facilitate the services; in the case of WWF in Finland (Share ideas), the SMS alert system is the core part of services. Therefore, it's important to understand the service ideas and specific needs to anticipate the potentialities of mobile communication in supporting enabling solutions.

Not only services ideas, but also democratic groups of services determine the needs of technologies. Different democratic groups have different experiences in use of mobile phone and services. For example, the young have easier acceptance and greater capacity to adopt, adapt, use and innovate the new communication technologies so they are always at the cutting edge of the cultural and technological innovation. While the elderly users prefer to use mobile phones as simply as possible. Therefore the technologies and services have to balance between the capacities and motivations of participants in involving or learning to involve the services.

Mobile social network and trust

Some mobile social networks are typical MCT-based enabling solutions like Dodgeball, Friendstribe in USA and Bedo in China. Bedo is the first location specific mobile social network (Lomoso) in China including the other services like push-to-talk, Instant messages, M-space,M-blog and so on. It has been launched at the beginning of 2008 and made great success. In this case, a new enabling solution as a complicated system has been developed to generate and scale-up the collaborative services. It enables young people to enhance and increase the social fabric a new and attractive way in immaterial world and also in physical spaces.

The key competitiveness of the service is the balance between un-expectable sense and security. It's not only mysterious and attractive but also reliable and secure. This enhancement of security and trust results from two aspects: firstly, mobile phone is a personal handset and has strong identity not only it's a expression of personality but also it is subscribed with real ID of users; secondly, the location based services provide a physical dimension of connection between them and possible opportunities to interact in physical spaces. Both of them are distinguished characteristics of mobile communication.

Conclusions

Collaborative services, implicated in grassroots social innovations as creative communities and diffused social enterprises, were found in Europe and other emerging countries like China. By case studies, it reports Chinese collaborative services have different characteristics from European experiences in terms of content, motivation, structure, scale, context and so on, which calls different policies and technical supports.

Case studies show that up to now the practices of collaborative services haven't indicated the specific value of mobile communication in service system in general but it has been widely used as creative services or applications for generic social benefits, impacts, changes and innovations, which implicates mobile communication and network are becoming an significant driver for social innovations.

It’s clear that mobile communication has important contributions and potential roles in the promotion of collaborative services in the perspectives of context improvement and enabling solutions development. MCTs supporting context has two aspects including the external condition as ubiquitous and permanent connectivity and the internal condition as participative social learning process. The discussion on MCTs enabling solutions indicates that mobile communication has potential roles in the establishment of the bridge from immaterial world to a real world, the adoption and adaption for different service ideas and demographic groups, the trust increasing by mobile social network and so on.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

A Dialogue on the Future of Design Education

Naomi Gornick [1], Ian Grout [2]

Abstract

The paper investigates two educators' responses to dealing with world uncertainty and change and falls into the conference's general theme of 'Tools'. The authors take their existing programme curricula, philosophy and strategy as a starting point and discuss together their ideas for answering the following questions:

How well are our current programmes responding to our changing world?

How may we change programmes in the near future with the objective of developing best ways for preparing students for the current and emerging local and global contexts?

The authors seek to move design education from discipline specific to holistic, from relative certainty to better best-guessing, from designer as individual to designer as teamworker, from standard of living to quality of life.

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Introduction

In this study, we want to, together, examine how we believe design education should evolve in the future. This paper represents an extension of a group seminar we were both involved in last year at the 'Connecting' Conference in San Francisco along with other International design educators and practitioners (ICSID 2007). That discussion confirmed to us that there is an urgency to the development of this subject in expectation of an impending massive change in world conditions, the imperative to take action, the seemingly steady marginalisation of design and its inability to respond quickly to these conditions. Designers appear to have reached an important stage of public and corporate recognition, but at a level that may not adequately reflect their true worth to society. Designers are in a significantly enhanced position to lead with new ideas and yet few are in key decision-making roles or realise the potential and responsibility to be a part of this change. We argue that a major reason for this paradox is the cautious reaction of design education as a whole to the current global issues that form the context for all design activity.

We discovered, in starting to plan this study, that although our academic interests took us in different, but parallel, directions, our attitudes to change in design education are extremely similar. Naomi Gornick began, in London in the late 80s, to develop masters programmes for experienced designers to take up senior roles in manufacturing and service industries, concentrating on designers' roles in, mainly, large organisations, thus developing an interest in organisational behaviour and strategy. Ian Grout and Norman McNally at The Glasgow School of Art transformed a vibrant product design course into a forceful programme highlighting and developing the designer's connection with and responsibility for society's contemporary and rapidly changing needs. What we appear to have in common is a certain 'maverick' side to our personalities and this characteristic has enabled us to develop radical programmes recognised in Gornick's case by the high profile of many of her graduates' career patterns and in Grout's by a new vision of the 21st century product designer concerned with ethics, sustainability and ecological issues in a societal context.

We each have a determined and personal way of taking strategies into action, the departments in which we operate understand that dimension. There were and still are institutional champions of our way of thinking that enabled and still enable our educational experiments to flourish.

This paper represents a dialogue on our main concern – a huge subject, the future of design education. As we began to write out our chapters for this paper, two aspects became clear. First, this study is the start of a much longer conversation and secondly, we approach the investigative process in two very different ways as a result of where we stand today – Ian, experimenting inside the education system and looking out and Naomi, reflectively re-appraising the system and looking at broader contributing factors to its strengths and weaknesses. So, we decided to let the stories run their own course so as to better understand how we both got to this particular crossroad at this point in time and what that meant to each of us. In the summary we will attempt to consolidate what we have communicated here and what, hopefully, may be of future value, each to the other in moving forwards and also to the general debate on design education's future.

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"The meeting of two personalities is like the contact of two chemical substances; if there is any reaction both are transformed" - Jung

What are our backgrounds and what are we bringing to this dialogue?

Naomi:

Looking back, it's difficult to recall the time in the 80s when a small number of dedicated people were trying to persuade UK industry to integrate design into their organisations for greater economic success, especially today when most international companies recognize the value of design as a major business resource. There was a huge wave of enthusiasm then for the field of design management and this was carried along, in no small way, by the influence of a number of seminal reports on the importance of industrial design for UK manufacturing industries and the future of industrial design education (Carter 1977, Corfield 1979, Hayes 1983 and DTI, Design Council 1984).

I was invited to start a Masters in Design Management at the Royal College of Art in late 80s with David Walker from the Open University. We wanted to create 'new design professionals' who could take up the equivalent of management roles to promote the value of design throughout industrial organisations. From the start, in research projects, we collaborated with large companies that had design management facilities within their organisational structure, such as British Rail, British Airways and London Transport. As educational experiments do, this first attempt floundered. But not without creating some remarkably successful graduate careers. Subsequently, Brunel University Design Department asked us to set up a new programme and in 1994 MA Design, Strategy and Innovation was launched and is still going strong.

Our educational rationale was not to make designers reject their core skills, but to make them contextualise their professional work and give it a new sense of purpose. This new platform of education at Brunel included:

- A core taught syllabus based on case studies and current design and management literature
- An emphasis on team building for investigative research projects
- Links with Brunel University School of Business and Management
- Formal industrial collaboration leading to employment opportunities

Fully one third of the curriculum was devoted to students work with industrial organisations which took the form of a team-based company audit and individual internship. Through these projects students had direct contact with managerial personnel. They had to learn new languages to communicate with their management counterparts. Most of all they had to learn by listening. Many graduates have started their own consultancies such as Engine Group and Plot, several are working inside companies as I originally envisioned such as British Airports Authority and Procter and Gamble, some are educators such as Alison Prendiville, Senior Lecturer in Contextual and Business Studies, Product Design Futures, University of East London

One of the greatest influences on my thinking in developing the RCA and Brunel programmes were Ralph Stacey's ideas on the conversational lives of organisations (Stacey 2002). Design and management have two distinct languages and cultures, so conversations and power relations between designers and managers become paramount. It was obvious that design-trained students needed special skills and Stacey describes these as:

- The capacity for self-reflection and owning one's part in what is

happening
- The ability to facilitate free-flowing conversation
- The ability to articulate what is emerging in conversations
- A sensitivity to group dynamics

Designers do not automatically acquire these skills in their undergraduate years. We always acknowledged that the reasoning behind these graduate programmes was based, in part, on an underlying paradox in undergraduate design education. The ethos of the design academy is that of a hothouse of invention, creativity, and “blue-skies” thinking. The dilemma still is, how much of the outside world should be allowed in while this creative development is taking place? In the years since we started, there is far more inclusion now, in undergraduate programmes, of the key global issues affecting design under ‘design studies’ or ‘cultural studies’. The level of this exposure varies enormously, much depends on the predilection of individual programme leaders and tutors and on the ethos of institutions. In my research I have argued for the inclusion of business and contextual studies in undergraduate design degree programmes (Gornick et al. 1995). Now as I continue my investigation, I begin to look at two new areas: first, how as a consultant rather than course leader, I would further develop Master’s programmes based on design in current organisational life and reflecting today’s key issues of sustainability and ecological dilemmas and second, how the general flow of undergraduate design education should now, most appropriately, be carried out. It was with both these subjects in mind that I wanted to engage in a dialogue with Ian.

Ian:

In 1999 we began a radical overhaul of our courses in Product Design at GSA. We had a gut feeling of the world changing and with it a future change in design education. We had been experimenting with the course, moving towards the humanities. We were interested in social sciences which we saw would enable us to develop a better understanding of:

- designing for society
- our relationship with and the design of artifacts
- how to educate designers for a changing world

I had been developing sustainable design. As most practicing designers at that time I was still trying to make sense of this. Papanek, (Design for the Real World 1972), Schumacher (Small is Beautiful 1973), Pye (The Nature and Art of Workmanship 1968) and Womak and Jones (Lean Thinking 1996) were what we were working with. This was limiting considering our changing world. A more humanities centred design approach seemed a positive opportunity for the development of sustainable design education. At that time I had no idea where it would lead but to take action in this way felt intuitively right. Designers trust their intuition. I trusted mine.

So now we were designing design education. We created 2 courses, both innovative, both new and that, as they say, was where the fun started. Designing them was relatively easy and took just a few weeks. We knew what we wanted to do, why we wanted to do it and how to do it. What took time was to get it through the management systems at GSA. That took a further year and a half.

The first course, a 5 year Master of European Design (MEDes) is a 3+2 integrated masters in partnership with; Konstfack, Taik, Politecnico di Milano, KISD, Kunste Akademie and Les Ateliers. Increasingly, designers were working Internationally so we wanted design education to be truly International. We also

wanted the excellence and diversity of each partner to enable individual pathways for the students. To this end the programme was constructed to allow 2 exchanges of one year each. This results in unique and very individual students who are broadly cultural, mobile and in tune with developments across International boundaries. They work Internationally, naturally. The programme is minimally bureaucratic, the students remain students of the home institution which awards the degree. Within this the students and staff enjoy a culturally rich network to exchange and develop the latest educational thinking.

The second course is a 4 year Bachelor of Design with Honours (BDes(hons). There are distinctions between this and our old BA, namely:

- An integrated first year giving 4 years for the degree allowing us space to teach an expanded skill set
- Sharing the first 2 years with the Medes course
- European language teaching
- An extensive dedicated exchange programme with 15 global partners

We also integrated social sciences into the curriculum firstly with staff from humanities at Glasgow University then, latterly, with dedicated staffing within the department. Currently, Gordon Hush, our acting head of department is a social scientist. This opening up of product design and new relationship with social sciences allowed us to move from “how to design” - problem solving towards “what to design” - a deeper understanding of the issues of living into the future in a changing world. Furthermore, it has created a course that is inherently flexible and adaptable and able to be under continuous development, projecting visions and developing new tools for future education. As I intended, it is a good place to be when considering future issues of sustainable design education.

We took it upon ourselves to develop these programmes, there was no pressure from the school to do so. The motivation came from the feeling that the old BA model had run its course and that something new had to be in place.

When we started out we expected that the MEDes would need the most developmental input and the BDes(hons) would simply be a development of the BA. The MEDes naturally found its own way and is still substantially as it started out. By nature it is more of a network of independently evolving courses rather than a course per se. The BDes(hons) rapidly entered new educational territory and we found ourselves well ahead of the game. Consequently there has been much learning as we grew and this has created a symbiotic relationship between the students and staff. We enjoy a collective pioneering spirit.

What are the current contexts of design education?

Naomi:

We have been describing our own educational experiments but we have to acknowledge that these are part of a number of new radical initiatives that have emerged in Europe and USA during the last two decades. This development is largely driven by academic authors, some of whom we know very well, in design

institutions who have an acute awareness of global changes in industry and society and who recognise the dichotomy between design practice and education. Each programme has its author/s own distinctive aims and objectives. A key characteristic of this phenomenon is the disparate nature of these programmes and their potential institutional vulnerability. There is no overall directive, although in the UK a new government sponsored inquiry (Design Council 2008) is working towards broad educational change.

Certainly, current world affairs are having an effect on many branches of education. The shifts in economic structures, changes in corporate life as well as new thinking on environmental issues reflect global opportunity and upheaval as well as remarkable changes in society norms and work patterns. To examine the future of design education, I think we need to look on the client side as well as the new world of the design practitioner.

There is much discussion on the need for massive corporate organisational change. This has been described (Zuboff and Maxmin 2002) as a current 'transaction crisis' between institutions, companies and consumers and promotes the idea of a new and greater understanding of the needs of all stakeholders. Existing traditional business practices must be humanised. We need to take a meta-view of a new economic system required to deal with fluctuating markets and uncertain business environments. A leading management theorist (Mintzberg 2004),holds MBA programmes in business schools responsible for many of business's ills, as the teaching stresses formal analysis and control rather than much required vision and experience of webs, networks and teams.

Business and management practices have certainly caused many of our current problems, but designers also have to re-examine their own practices. On many levels, designers are expected to understand increasingly rapid and unpredictable changes in corporate life and consumer behaviour and to help their client companies anticipate future trends. Can they do this?

A few leading design consultancies, the Doblin Group, IDEO, Seymour Powell and Ziba Design for example, undertake extensive user research for their clients. Essentially, they are moving into the sphere of management consultancy but with enhanced human-centred tools and techniques. As management consultancy and design consultancy converge, we may see the emergence of a new type of innovation consultancy. Both Richard Seymour of Seymour Powell and Sohrab Vossoughi of Ziba design are adamant about the need for design practice to broaden its sphere of responsibility (Gornick 2006). Seymour believes 'all the boundaries designers are familiar with are dissolving". He wonders whether the design industry is capable of being fast enough to understand what is needed from them to fulfil client needs".

Equally, in-house design teams and design managers have reached an important stage of corporate recognition, at a level that makes many demands on their innate knowledge, interpersonal skills and forecasting strengths. These shifts point the way to an expanded new world opening up for designers to enlarge their range of activity. Whether designers choose to take up new roles or not, the expectations of their knowledge and position in business life have become significantly heightened. Their opinion and advice will be sought after more than ever before. The opportunities exist if they can take up the challenge. Enhanced design education is the key in this respect, and this process, for designers, does not stop at graduation. It is a case of life-long learning.

Ian:

In the intervening period since we began our new programmes much has changed in the world. As sustainable design has become more important there has been both convergence and divergence in both thinking and action. Convergence in the sense that from relatively fragmented approaches there has emerged, broadly, two directions and divergence in that they are diametrically opposed.

(1) Concerned with sustainable designing for the status quo that supports; a growing standard of living, extending status and ownership, continued economic growth and increasing energy needs met through new technology. In this approach sustainable design becomes a quantifiable, bolt on, component typified by cradle to cradle (McDonough and Braungart 2002) and dust to dust design activities.

(2) Engages with the changing attitudes of society and explores design in a more holistic manner, social and cultural in ways of designing for quality of life centred in opportunities for and including: co-designing, designing for society, designing for the experience of living (programme development, product design, GSA 2008), affordance (Gibson, 1977), social innovation, social ecology and social entrepreneurship (Bornstein, 2004). This approach can be typified by the EMUDE project in which we explored, through eight European design schools, people inventing sustainable ways of living (Manzini et al 2007).

Both approaches have their devotees but, in general, action in sustainable design education has been too slow. This may be for several reasons, fixed modular educational programmes, increasing bureaucracy, lower funding and the rise of research in the purely theoretical. All have their effects in slowing down the ability of academics to make experiments and take risks. As I was writing this I was listening to a radio programme on bureaucracy in secondary school teaching. I heard this, *"As I test them more and more I teach them less and less . . . soon I will be absolutely sure that they know nothing at all" (anonymous teacher, Radio 4 UK, 23.05.08, 17.50).* We would all recognise this as a growing issue in higher education and the problem inherent in it as symptomatic of the barriers we face to change.

What do we think are the future contexts for design education?

Naomi

It is mysterious that the education of designers is so entrenched when other areas are adapting to new global conditions rapidly. Admittedly, it is difficult to move a very structured, discipline-specific culture, now bound on many sides by complex funding arrangements, evaluation criteria, assessment requirements and increased research demands. But why is it more ponderous for design than other disciplines going through similar metamorphoses? We need to consider the following aspects:

Most pressing for Western design education is the recognition that the development of design in the Far East will outstrip provision in Europe and USA. It's interesting to compare the numbers of institutions with design departments. The Chinese authorities have decided to establish over 400 design schools. There is no doubt that they see a direct link between design and a successful economy. In

comparison the UK has 190 institutions offering design programmes and in the USA, NASAD lists 248 art and design institutions.

As the recent British official commission chaired by Sir Nicholas Stern (Stern 2006) stated, climate change "is the greatest and widest-ranging market failure ever seen". IHT (Lieven 2006) comments on this widely-publicised report: "The question now facing us is whether global capitalism and Western democracy can follow the Stern report's recommendations, and make the limited economic adjustments necessary to keep global warming within bounds that will allow us to preserve our system in a recognisable form; or whether our system is so dependent on unlimited consumption that it is by its nature incapable of demanding even small sacrifices from its present elites and populations." It is in this area of current high-profile concern that many designers are now making a choice of the direction they wish to pursue

Recently discussion has turned to the nature of the traditional design brief and the necessity for designers "to find" the problem for the client's organisation. In conversation with Garry van Patter (van Patter 2007), Min Basadur quotes research indicating that successful leaders of the 21st century "be they designers or politicians or managers or concerned persons of any type, are going to have to do more than just get important problems properly defined. They are going to have to generate such problems first and excite others about taking them on." Problem finding "means continuously and deliberately discovering new and useful problems to be formulated, solved and implemented."

One of the difficulties here is that most often people involved in problem formulation fear failure in the implementation process and especially current media attention to applying blame. It takes a certain kind of courage to undertake a different pathway.

There is considerable urgency in this discussion. When design graduates leave college they will be representing 'design' to the people they deal with outside their design world. They will need to communicate ideas of meta-design, not simply the discipline – graphic, product, interior, fashion – in which they've been trained. This idea is echoed (ICOGRADA web-based newsletter) by Richard Grefe, Executive Director of AIGA He wrote (Grefe 2006). 'Clients seek "designers", broadly defined, and the highest and best use of a designer's talent depends on the way he or she solves complex problems, not bounded by the medium of the outcomes'.

Educational experiments will continue to flourish inside those academic institutions interested in broadening out design education. But if we are concerned about future generations of designers and the slow pace of change in design education generally, then we have to conclude that that the numbers of graduates emerging from new, innovative programmes are too low, at present, to make a substantial difference overall. A critical mass is required for a significant change to be recognised and time is of the essence.

Ian:

We face a future that is increasingly unstable and less easy to predict. We all know that we are rapidly accelerating towards many new challenges, that this is unavoidable and that we are, to a large extent, in denial. We need to take urgent action for and in the education of our students.

I would make a positive comment here that, right here right now, this is the best opportunity for design that we have had since the Industrial Revolution. *"The*

great thing about the dilemma we're in is that we get to re-imagine every single thing we do . . there isn't a single thing that doesn't require a complete remake. There are two ways of looking at that. One is: Oh my gosh, what a big burden. The other way, which I prefer, is: What a great time to be born! What a great time to be alive! Because this generation gets to essentially completely change this world" (Hawken 2007)

What I have learnt in developing sustainable design at GSA is that the approach expressed in (2) above affords a positive way forward for the future. We can see great potential in designing for; real issues, real users, real situations and real life. It can offer tangible outcomes in being able to work across specialist disciplines including ecology, economy and society. It works in a virtuous cycle of philosophy and action. With this adaptive and flexible methodology we may find ways for design to help tackle global warming, reduction in biodiversity and the ethical issues surrounding the exploitation of other cultures to prop up our consumerist addiction.

I have found designing in this way with students has been very successful in social entrepreneurship including community based projects on the south side of Glasgow concerned with social issues surrounding waste and in Drumchapel with a wood recycling company strategically developing a bid for new funding.

One issue seems central here and this is peak oil (Bently 2002) and energy descent (Abdullah S, 1999). From this has grown the transition town movement (Hopkins, 2008). There is potentiality here for future design education in that this movement expresses a view of a positive ecological aware society that is actually in formation. Its views, actions and development forms a real opportunity for taking action in designing and testing new pathways for future sustainable design.

What do we think are the potential future pathways for design education?

Naomi:

I believe designers are natural pathfinders if they put their minds to it. Larry Keeley, Doblin Group in Chicago says (van Patter 2004) "In a world with far more designers, designing far more artefacts, there is a cadre of individuals who want to think deeply about what life could be, what it should be, and what our role is in closing the gap with our daily reality. Thoughtful designers must find one another, and continue to ask the tough questions"

My colleagues and I know that design management must move with the times. We must re-visit and re-examine the emphases of our educational models. With educators from London College of Communication and University of Dundee I have organised three symposia in the last year designed specifically to bring together practitioners, educators and researchers (who do not normally meet together) under the title of 'Metamorphosis of Design Management'. Key themes have emerged from this continuing discourse that include the changing contexts within which design management practice operates and the need to explore the changing roles of design management practitioners to help inform the process of new academic programme

development.

The ds21 project also provides a direct examination of future pathways for design education. In the report 'Tools for Metadesigning' (Wood 2006) initial questions were raised with regard to this subject:

> - Ecological design as a discipline is still too over-specialised, politically confused and emergent to make a sufficient impact. Our economic system encourages consumers (and designers) to live (and design for) a scale and pace of consumption that can make Eco-design counterproductive.

Arguably, designing a 'total living style' is too complex for traditional modes of design because it would require the cultivation of a discourse of synergy that goes far beyond what conventional designers are trained to accomplish. Such a high level of complexity calls for the development of an appropriate mode of 'metadesign' that will incorporate synergistic methods within whole systems.'

In the same report, I asked (Gornick 2006) 'How do we teach 'metadesign' to design students and to practising designers? Should traditional design education transform itself into metadesign education? Could traditional design education transform itself into metadesign education (bearing in mind an equally traditional reluctance among design educators to countenance change)? Should there be a separate discipline of metadesign education, alongside traditional design education? Or should design education remain as it is, highly discipline-based, and other related professional disciplines ie sociology, anthropology, media, move into metadesign education?

In the global economy there is now a wider range of career paths for designers. From RCA and Brunel the numbers are small, but there are steady career development patterns. Here's an example of a 'new design professional'.

Jake McLaren was an excellent industrial designer who graduated from Brunel University MA Design, Strategy and Innovation in 1996 with distinction. As a result of his specialist thesis on recycling electronic hardware he worked with Nokia for 8 years at their HQ in the UK as Environmental Specialist, Design for Environment. His role was to embed and manage environmental issues within the R&D function of Nokia. The scope of his work was development of mobile phone products, within the Multimedia Business Group. This is very much about operating in an influencing mode to make sure all the disciplines involved in R&D take care of various environmental issues. In short, he was acting as a environmental design champion within the company.

His tasks in Nokia included, defining and managing environmental requirements, managing research and internal implementation projects, supporting and training R&D programmes during product development and representing Nokia UK regarding environmental issues to suppliers, customers, media & government.

Learning from Jake's and other graduates' career experience a new educational model for design begins to take shape for discussion:

<u>Traditional design education</u>	<u>Towards Metadesign education</u>
Design discipline pathways	Understanding design holistically
Individual projects	Working in Teams

Designers relating only to design	Designers and synergistic context
Starting from Zero	Value of Constraints
Technical skills	Analysis and Synthesis
Design in Theory	Design in Practice

Ian:

The Glasgow School of Art, Plymouth University and HDK Göteborg are constructing a joint project with Transition Town Totnes for the spring of 2009. This project, based on eco sufficiency and resilience will concern itself with the pragmatic growth of knowledge in the expectation of discovering new ways in which design may work within an ecologically aware society and how an ecologically aware society may work with an expanded social view of design. The two key philosophies mentioned above can be expressed thus:

Eco-sufficiency:

- Requires a reduction of the level of production and consumption.
- Has potential to reduce substantially use of natural resources without compromising human wealth.
- Is closely related to issues of quality of life and life-balance
- Wide spread eco-sufficiency will only occur when less material wealth brings increased well being or happiness to individuals and societies.

(Wuppertal Institute 2005/2006 & SERI's 2007)

Resilience

A resilient system:

- Is adaptable and diverse.
- Has some redundancy built in.
- Acknowledges that change is constant and prediction difficult in a complex, dynamic world.
- Understands that in manipulating individual pieces of a system, it changes it in unintended ways.

In a resilient system:

- People, companies, communities and countries draw on support and resources from elsewhere.
- Components are self-sufficient enough to provide for essential needs in emergencies.

(Ward 2007 & Dixon, 2007)

In this project we will look at how one supports the other, affects the other and transforms the other as a way of building new design vocabulary and tools for designing in the service of society.

This will also aid in the designing of a new set of masters programmes currently under development at GSA. As with the MEDes and BDes(hons) these new programmes will have an open architecture able to be flexible and adaptive in their future development. At its core is the idea of designing for the experience of living. In that I see design as a proactive agent in a transforming society. It builds on current experience and develops, amongst others, these tools: Social sciences methods, Co

designing, Scenario building and story telling. Design activity will be based in the understanding of human activity through which we may afford service, system, object, interface and interaction design to symbiotically work better in the service of humanity. Embedded in this is designing in context where the activity (for instance brushing your teeth) and the players involved (say eight year old children) are explored thoroughly from which the design opportunities can be revealed (centred within the activity) and then the service system, product combination can be enhanced, altered prototyped and tested to improve the situation you are designing for.

One further opportunity is to learn from your students. Recently I saw a draft PHD thesis in HDK entitled Fashion-able (Heretic Journeys in Engaged Fashion Design) by Otto Von Busch. Here is his summary: Coming back once again to a designer practice, I think it would be something like this:

- Accessing technology
- Promoting transparency
- Empowering users
- Decentralising control
- Creating beauty and exceeding limitations
- Using the intelligence of many for innovation
- Making constructive assemblies
- Creating interfaces and sharing the knowledge
- Keeping the power on

Or to put this in a more metaphorical way:

- Explore the everyday
- Use tools at hand
- Start where you stand
- Be practical
- Leave the door open
- Colour outside the lines
- Multiply

The only thing that I would add to this is, accelerate.

The overarching driver here is that design can't of itself change the world but can be a significant part of a word that is changing. Designers must work in this world rather than about or upon it. (Wodiczco. 1999) In recent years I have had the good fortune to work with wonderful people from outside the traditional disciplines of design. All have openly expressed that most of what we are discussing in our changing world is, to a large extent, a design issue and a frustration that there seems little that design is doing in these issues. It is my ambition that future designing will be concerned with designing for, and here I purposefully repeat myself; real issues, real users, real situations and real life. In pursuit of this, design education will seek deeper relationships with disciplines able to transform society. This is an exciting prospect and one from which there is much to learn and opportunity to take action.

Summary

In drawing this dialogue to a close for the time being, we decided that the title 'conclusions' would be misleading. In essence, we feel that the conversations must

and will continue until such time as relevant progress in design education is actively pursued by many, rather than just a few.

We have structured this paper to give an overall view of our own pathways and our joint concerns. Building on our own experience we can see common characteristics in ourselves, as well as the colleagues with whom we work and the institutions that enable our work to develop and grow. But more than that we and many of our colleagues seem to have developed antennae for the remarkable changes in economics, technology and society which are not only making traditional design roles outdated but also generating a rich field of opportunities. We seem to be able to convey to our graduates a strong belief in our programmes while not simply filling up the demand for student quotas. We aim for graduate employment but also send out a strong message for long-term ambitions for world-wide economic and social improvement. We represent part of revolutionary global changes that carry designers towards new and meaningful roles.

In examining the current and future contexts of design education we wanted to investigate the predilection for change and the barriers to change. Our dialogue presents not only our thoughts but also the people who are influencing our thinking. If there is a message coming out of this paper it is this; there is a pressing need for a transformation of design education in general. Our society is in transition, new markets are emerging and the economy is finding new routes. We can and must be in the vanguard as proactive contributors, as this transition has much to offer designers. If we don't engage, our profession runs the risk of being further marginalised and irrelevant.

It is also imperative that we achieve a critical mass for change in design education. As we see more mass movement emerging in our society towards change so design should follow. There is a need to accelerate our activities. In respect of critical mass it's worth reflecting on the 80/20 rule (Juran 1951). The rule asserts that approximately 80% of the effects generated by any system are caused by 20% of the variables in that system. So, in our society, markets and economies we could say that 80% of the change comes from 20% of the people.

This initial dialogue has been valuable. We see also that there are many more design practitioners and educators wishing to engage in this type of debate, many of whom are willing to take ideas into action. We had an indication of this, last year, in San Francisco. We believe that there are a number of new educational and design practice initiatives world-wide that would benefit from being connected. A comprehensive survey needs to be carried out at the earliest opportunity to determine the rationale of these programmes and where they are taking place. This research should explore, at an International level, those advanced practices with which we could have a deeper more prolonged dialogue on these pressing issues.

Finally, we put forward this familiar quote as encouragement to educators contemplating taking innovative leaps in pursuit of change towards a better world through the education of their students who are, after all is said and done, our future society.

"First they laugh at you, then they ignore you, then they fight you and then you win"
- Ghandi

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

productive friction:

a case study of design research between practice, education and community in rural australia

Fiona Harrisson [1]

Abstract

This paper offers the process of working between three divergent perspectives of practice, education and community as a vehicle for changing the change. These ideas will be explored through a case study of a design project in two remote rural towns in regional Australia where RMIT University entered a practice relationship with the local Government. The project was also run simultaneously as architecture and landscape architecture design studios. Students, practitioners, academics, local Government and community came together to towards developing design possibilities. This meeting of diverse experience and different perspectives (practice, education and community) inevitably involved conflict but these tensions are described as productive friction. Rather than see this tension as something to avoid, this paper argues that it is the very tension that produces an outcomes beyond the sum of its parts. This paper will track the process and outcomes of this project.

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1. Introduction

This paper offers the process of working between three divergent perspectives of practice, education and community as a vehicle for changing the change. These ideas will be explored through a case study of a design project in two remote rural towns in regional Australia where RMIT University entered a practice relationship with the local Government. The project was also run simultaneously as architecture and landscape architecture design studios. Students, practitioners, academics, local Government and community came together to towards developing design possibilities. This meeting of diverse experience and different perspectives (practice, education and community) inevitably involved conflict but these tensions are described as productive friction. Rather than see this tension as something to avoid, this paper argues that it is the very tension that produces an outcomes beyond the sum of its parts. This paper will track the process and outcomes of this project.

2. scenario

The project focuses the processes and outcomes of a project in remote rural Victoria. Rainbow and Jeparit are two small agricultural towns in rural Australia located either side of the 39th latitude; approximately five hours drive from Melbourne, the University location. Both towns are remote in location and historically have been agricultural centers but more recently have seen steady population losses and reduced services as a result of the trend toward larger farms run by fewer people. This is a microcosm of larger global trends affecting rural towns across the globe.

This phenomenon of declining population is called 'Shrinking cities'. The reorganization of production and consumption across the global has resulted in both population expansion and, the less discussed, population contraction. Shrinkage is defined as "cities that have temporarily or permanently lost a significant number of their inhabitants." (Oswalt & Rieniets, 2006:156) The problematic of shrinking cities has received design attention though these have focused on postindustrial cities of more than 100 000 inhabitants rather than small towns in rural contexts such as occur in Australia. While these small towns share issues such as increased vacancy and loss of services, there are issues specific to small rural towns in Australia. For example unlike industrial cities, rural towns in Australia are low density and decline means that the towns become even less dense. Some large de-instrialised cities such as Detroit have decommissioned parts of its city to maintain density in other parts. This is not feasible in small towns with populations of less than 1000. Some protagonists in Australia argue that small towns should be actively decommissioned as Rogers notes, "the traditional economic enterprises are no longer viable, that both public and private services have withdrawn and that many communities are faced with environmental problems. Increasing population homogeneity, with very little to attract new people." (Rogers, 2001:135)

There is a possibility that the population demographic may increase in Rainbow and Jeparit, but it is more likely that the net population will remain the same or continue to decline. As Bourke and Lockie suggest that "the rapid and profound change which rural Australia is undergoing is at time exciting as it is worrying". (Bourke and Lockie, 2001: 1) It is evident in the towns that there is great flexibility within the community to adapt. Many shops within the towns take on a multiplicity of roles. The museum in Jeparit is open seven days a week on volunteer labour alone. It also plays the role of informal drop in centre. Some farmers volunteer to do shifts within the museum as a break from the isolation on the farm. Many of the students were impressed with the level of social capital in the towns, something less apparent in big cities. The student projects

drew on this social capital to inform their re-imaginings for the future.

Some local governments have been proactive in seeking ideas for rethinking these towns in response. The Hindmarsh Council, responsible for Rainbow and Jeparit, were keen to invest in the towns to support the remaining inhabitants and to consider how these towns might be developed from a landscape and marketing perspective. They selected a consultant team lead by NMBW Architects on the grounds that the project was also part of a design studio at RMIT University and included extensive consultation. The consultant team was made up predominantly of architects, I was the consultant landscape architect on the team. Myself and another member of the consultant team were also lecturers at the University and led an architecture and landscape architecture design studio. This decision was a risky one on behalf of Council as the team, at that stage, had limited experience working in this context and the process definitely didn't follow the convention or aspire to known outcomes. The Council was obviously satisfied with the outcome as they engaged the team again to work on another larger town within the Shire.

3. productive frictions

This project was simultaneously run as a consultancy and as a design studio between landscape architecture and architecture within RMIT University. This hybrid approach to the project enabled more time to understand the town and also to investigate other roles for design in situations of decline. Rather than see education and practice as separate, students, along with the consultant team were involved in extensive community engagement including a series of public and individual community meetings designed to solicit local knowledge prior to the commencement of design. During the design phase feedback was sought through presentation at public meetings and also the final work was exhibited where locals were invited. This level of consultation would have been impossible on the fees allowed for towns in decline. The dual pressures of academic scrutiny, responding to the Council brief and also taking on board the community comments pushed the final outcomes further than would have been possible for consultants alone or had the project remained within the walls of the University. For RMIT University, working with community is part of the University brief. This project achieved the strategic aspiration of working with community as well as with Government partners, as students were offered the opportunity to work in close relation to community. The theory that often remains within the walls of the academy became practice.

Following is an account of the project organized around a number of tensions that have arisen as a consequence of the hybrid between practice, academia and education. This paper argues that proposals are both more challenging and more possible as a consequence of working between three divergent perspectives of practice, education and local community. It is the friction between divergent paradigms that offers the potential to both think and act differently.

Between academia and practice

The straddling of practice, teaching and academia enabled more time and more heads to understand the specific dynamics of these towns and to consider the possibilities of design. Students were obliged to straddle the academic requirements of design research, to explore and innovate design scenarios that are not already existent. The hybrid consultancy/design studio brings another pressure to bear, as it obliges that the design ideas are relevant to the community and is also able to be built. It is this seemingly contradictory pressure that enables outcomes not impossible but often not achieved in academia or consultancy alone. It also allowed an engagement with the broader research agenda of shrinking cities and the role of design in declining communities rather than expanding ones. This project became a vehicle to imagine other possible futures where design is embraced as a catalyst for change rather than something that should or could be turned around.

The focus of the design projects was not to try and reverse the population loss rather it asked for an exploration of the potential of decline. This required a rethink of the role of design because design is often premised on growth and future redevelopment. Tourism is the conventional way in which small towns have been developed throughout the region. Whilst there is potential for tourism it is highly unlikely that all towns will succeed in becoming tourist towns. Tourism therefore was not accepted as a valid driver of the project, though it could be a by-product of an idea. It was clear that the towns were in competition so it was also agreed that whilst the consultation process and design ideas were specific to each town, the towns would not be set in further competition where possible. They were considered as a collection in terms of their contribution to the facilities in a larger regional context, thus the strengths of each town would be identified and built upon and services would not be duplicated. The project was premised on the assumption that decline was likely to continue. The task was to speculate on other possible futures whilst also working in relation to what was already evident in the town and region. Could the increasing vacancy provide an opportunity for something else? Could perceptions of decline change? How could it be an impetus of transformation into an unknown future?

Doubling as teachers and consultants

The studio teachers operated simultaneously as consultants. This doubling of roles allowed the project to be explored and developed more thoroughly than would have been allowable for a consultant required to fit the budget. The studio component of the project occurred at the front end of the project to align with the design exploration and community engagement part of the process. The students and the consultant team were involved in extensive community engagement and in the production of design. There were a series of public meetings and an exhibition of student work to solicit feedback from the community who were considered as integral to the outcomes of the project, though not necessarily the final determinants of the outcomes.

The process was structured over a period of four months, we visited the towns once a month over this time and four times as a collective. There were three community consultation meetings and an exhibition, these were timed to be in sync with the University semester. The assessment milestones were tied into the community presentations, which allowed the students to be active participants in this process and also intertwined the academic and the community requirements. All of the meetings occurred in the towns rather than in the University to emphasize the ‘live’ nature of the project for the students. The process of consultation was paralleled in each town. Each time we visited we would go for intensive weekends where we would spend time in each of the towns. If you imagine 30 – 40 students descending on a town for a long weekend, our presence was conspicuous and the businesses appreciated the influx. This number of people allowed a thorough investigation of the town as a whole including consideration of how this town operates in relationship to the broader context. The consultant team shadowed the community process. At the completion of the consultation process, the consultant team was responsible for pulling together a final set of proposals for the town. The final proposals included some of the student work, though not all projects were included in the final recommendations. As mentioned all student work, however, was included in the appendix of the final report, which acknowledged the student contribution to the process and design ideas.

The consultant fee was thus dedicated to the production of a comprehensive report which provided a series of packages of work that was limited to $10 000 to be built over a period of ten years. It also documented the process including the community interviews and provided an appendix of all of the student work, so that this was not lost. Parts of the student projects were

included in the final recommendation, so by including the student proposals in the appendix, it acknowledged their work and also allowed the community or Council to revisit the ideas at a later if they so desired.

Between participation and design

The extensive design community meetings were set up to enable a participatory process whereby the inhabitants could be involved in the process of re imagining a future that is not necessarily a direct reflection of the past. Rogers suggests, "To survive and prosper, small communities, must find new ways to define themselves-to recreate a future of their own choosing." (Rogers, 2001: 135) These meetings played a role in the community imagining another future, though this process didn't just unfold without conflict. As with all communities, this community wasn't a singular community it was many communities and thus wasn't collected by a singular voice. Conflict thus arose between the various communities within the town community in relation to what they wanted for the design. This conflict was embraced as an important part of the process not something that needed to be minimized.

The conflict about the future direction of the town became apparent through the community interviews and meeting. For example many people mentioned that more trees would improve the amenity of the town but numerously it was mentioned that many of the mature trees had been chopped down in the past few years. The issue came up in another interview, "lots [of trees] have been cut down and I just think why." They continue later in the interview saying that, "In a small town like Jeparit, the mostly older people have been brain washed to think we cant have these sorts of trees because they're going to effect drainage and crack the houses. We need then to have an open forum where people like yourself can come in and talk to these people and try and educate them." (NMBW Consultant Team: Jeparit interview 3)

Clearly there is not a consensus in the community around the issue of trees and part of our job was to wade into the issues and to find a way forward. We were answerable to all parties but we were also independent. Ultimately our job was to provide professional advice within the scope of the project. We saw our role as being in dialogue with the community through the community meetings and to put forward design proposals that were relevant to the lives of the people living in these towns. This role involved listening and finding out about the town from a range of perspectives as well as stretching each other beyond preconception. It also involved brokering between the different and often conflicting voices of community.

Operating between education and community

The 'live' model of studio teaching that this project undertook enabled students to have an insight into the implications of their design ideas in the world. The users of their project become an active force in the design process rather than passive recipients. For the students the stakes were high in this project as it was possible that their project might be built but also their work was scrutinized by the client (Hindmarsh Shire) and the users of the project (the community). Through the community process it was apparent that the outcomes of their work mattered, it wasn't just theory in preparation for the real world. The academic demands on the project meant that the students couldn't default to just keeping the community happy by giving them what they wanted and doing what was done in other towns. It required thinking in other ways about towns in decline, responding to community concerns and building on local knowledge.

The community was aware that the students were asked to be exploratory and the community brought openness to the work presented. They appeared to appreciate the effort put

into the ideas and they also provided feedback and direction. This was a critical moment of readjusting and redefining projects in response to the comments and surprising things came out of this stage of the process because the student work was not constrained by past limitation. For example, many students proposed development including the vacant blocks which once had houses and others suggested developing part of the large blocks where people still live. Through the community consultation it was revealed that unlike the situation in the cities the privately owned property would be more easily negotiated to develop that the land owned by public Authorities.

Between the event and the design outcome

During the community interviews many people mentioned that “its nice to know that somebody is interested in our town. It was just good to feel that somebody was interested” (NMBW Consultant Team: Rainbow interview 1) This came up a few times in the interviews which indicated that the process itself was important. In many ways it is shift in thinking for the community that is the real outcome of these projects. The design proposals provide a vehicle for these imaginings. As Kilpatrick observes “learning has a transformative aspect, which has to do with understanding values, ideas and pressure from peers that constrain the way we think and act.”(Kilpatrick: 115) This process of learning is a multidimensional process and in this project is included the students, the consultants, the community and Council.

Whilst the locals have an invaluable insight into their towns they can tend to focus on what is lost rather than what they actually have. Kilpatrick describes a phenomenon called ‘regional lock-in’ “when social and cultural institutions cling to yesterday’s way of doing things” thus looking backward at what is lost rather than what might be. Kilpatrick suggests “Unlearning old ways is as important as learning new ones when it comes to adjusting to change.” (Kilpatrick, 2001: 118) One of outcomes of the design and consultation process was that other ways of seeing the town were offered.

The RMIT cohort were excited by these towns and thought that each town had distinct qualities that should be built on to use as the foundation of the design project. It was proposed that the project would build on the strengths rather than try to remedy the perceived problems. It was a useful exercise as it shifted the focus away from what was missing to what was possible with what was already there. This was an advantage of having people from outside of the town. It was the dialogue between the local knowledge and the outsider knowledge that enabled another way of seeing, thinking and making.

The process of design and consultation became an event in itself. More importantly perhaps is the role that the process has in shifting the community and the Council’s perception of the town itself, even without any physical changes.

4. possible futures

Following are two examples of student work, one a landscape architect and the other is an architect. One example of this was the proposal of a new walking track within the town.

The landscape architecture student responded to the existing network of walking tracks along the river. Whilst a walking track is conventional in and of itself, this project used the walking track as a vehicle to re envision the landscape of the whole town. It extended the flora and fauna rich river landscape into the township through planting both public space and the vacant housing blocks. Whilst planting on private property seems naive, the community suggested that this was a

viable option, in some cases more viable than using space owned by public authorities. The planting on vacant blocks tended to avoid the root problems raised in the meetings, as they would be away from public infrastructures. This is not how things tend to work in more urban environments but this the value of bringing in fresh eyes. Eyes that is willing to propose the absurd.

It was proposed that this project would be constructed over time. This slowly another vegetated pedestrian network would offer relief from the extreme heat of the summers. It would also extend the wild life corridors within the town. If the vacancy did continue then increasing the vegetation could expand. The issue of tree selection was addressed based on plants that had proved to survive the drought conditions in the town. A combination of indigenous and remnant exotics were used.

To realize a project like this would require close community consultation, as it is likely that the survival of any planting would rely of the care of locals. Whilst this might sound far fetched in the city, this is already happening in Jeparit as came out in the interviews.

Another student reconfigured the museum to redefine the entrance to the Jeparit. Rethinking the entrance was one of the explicit requests in the Council brief. Whilst the museum in Jeparit is located on the road at entrance to Jeparit, it is easy to miss as it is set back from the road and contained behind a cyclone fence. From the street the museum appears smaller than it actually is. It appears that the museum consists of the small timber building at the front where visitors enter when one enters it becomes apparent that the museum is vast in scale, made of up of many small buildings, sheds and extensive historic farming equipment. The design was simple; it proposed to remove the cyclone fence from the front and to relocate some of the museum equipment and a small building to the other side of the road opposite the museum, so that when one entered Jeparit, they actually drove through the museum. This approach to rethinking the entrance uses the town itself to redefine the entrance. This is an alternative to the redevelopment of signage as a logo which is a common approach to small town re-development and particularly so as a way of identifying the entrances. This proposal emphasized the entrance through exposing a very significant asset of the town, the museum.

The entrance to Jeparit was identified in the report as a priority area for development and one that would provide an immediate impact. Aspects of both of the above projects were brought together as one of the proposed packages of work in the final report and the museum entrance has already been redeveloped. The idea of the river walk and the museum drive through was hybridized at the town entrance. The final built outcome of the ideas as proposed were adjusted in response to budget and community concerns over security. Rather than move a building, large pieces of less precious but antique farm equipment was moved to the other side of the road and the fence that was removed was replaced with another more visitor friendly fence and as lower one that exposed the museum to the road. The planting aspect of the project was carried out but by planting small sized plants to maximize their chance for survival.

5. conclusion

This project offers the opportunity for researching the potential of design and this is something that would ideally happen in practice but is difficult because of the economic realities of small business. If, however, these explorations remain within the walls of the academy their potential is limited. This project offered working between practice, education and community as one way of bridging the gap between explorations that occur within the academy and the built

world. The remains how can there increasingly be dialogue between design research and practice.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Are you worth it? Can you fix it?

Investigating the sustainability of mundane activities using theories of everyday practice and human/ object interactions

Dr Tom Fisher[1], Sabine Hielscher[2]

Abstract

This paper discusses two processes of everyday life – hair care and the disposal of household goods. Both are aspects of our 'ordinary' daily routines which impact on resource consumption and therefore are implicated in environmental sustainability. Particular 'material interactions' (Dant 1999) that are part of hair care routines and which influence consumers' actions when disposing of goods are here considered. Both relate strongly to the emotional dimension of routine practices and draw from empirical research. The paper highlights that the consumption of resources in hair care and by replacing household goods are influenced by the integrative nature of the practices of which they are part rather than the degree to which individuals are dedicated to sustainability, though both may be influenced by Design. What is considered a 'normal' standard of greasy and unruly hair care (Hand et al 2005) or an acceptable plastic surface could be re-conceptualised and could in turn affect practices to conserve resources.

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1. Introduction

The environmental impact of consumption depends partly on consumers' habits; our everyday routines – our practices – consume resources. These habits are patterns of behaviour that have 'evolved' and therefore they are in principle open to change in the future. This paper discusses some aspects of everyday routines around hair-care[3] and the disposal of plastic goods that relate to how we feel about our material surroundings; it discusses the emotional component of those everyday routines for the insights this can provide into ways these routines might change to reduce resource consumption. Day to day interactions with hair and hair care products create and draw on standards that govern what is an acceptable feel, smell and look for hair. They often determine when to deal with one's hair or not and the nature of the actions that feel 'correct'. Equivalent 'feeling rules' (Hochschild 2003, Lupton 1998) are implicated in many decisions to dispose of plastic items where surfaces have degraded and become dirty.

Because we are surrounded with plastic products, some of which have visible effects on our environment as litter, the environmental impacts of plastic seem obvious. The plastic bags fluttering in the branches of winter trees, or other packaging littering our streets offends us aesthetically, but it is only the visible part of our large scale consumption and disposal of plastics. While packaging does account for 60% of the three million tons of plastic that the UK consumes per annum, a million tons is made into goods (FOE 2008). The lifespan of these goods is determined by more than just their material (Cooper and Christer 2005), but it is clear that in a 'throwaway' society all the factors that affect the decision to throw away an item are significant to its lifespan. These factors include the feelings that we have about the plastic materials that products are often made from which may prompt us to discard them.

Hair care routines also have a significant environmental impact. Showering and bathing accounts for 17%-18% of UK daily domestic water consumption - on average we spend seven to eight minutes under a power shower that pumps out between twenty and fifty litres a minute. These figures account for only part of the environmental impact of hair care as they omit the energy consumed to heat the water or to power hair care appliances and the waste produced from used packaging and unwanted appliances. Just as the rate at which products are thrown away has environmental impacts, so does the nature of our hair care routines. However the amount of resources used in hair care is not a 'given'; historical studies show that only recently has our current daily showering habit displaced the British tradition of less frequent bathing (Shove 2003).

While it may seem a little ambitious to claim that attending to the ways consumers' actions are reproduced in practices by concentrating on emotions may make it possible to move towards sustainable consumption, this attention to the details of everyday interactions with the material world does seem overdue. As highlighted by Sherwin and Bhamra (1998) in particular manufacturers often disregard the significant environmental and social implications of products in the use phase, concentrating instead on technical innovations. Such design strategies for sustainability emphasise improving the environmental profile of products through, for instance, design for disassembly and enhanced efficiency, but as Demi notes, these should not be the only focus as they ignore the more slippery phase of use (Fletcher et al 2001). Where designers have started to engage with the use phase by considering consumer behaviour, approaches are often solution-based; designers interpret and develop a design strategy and try to apply it to a certain context instead of being more explorative and considering if the strategy is actually appropriate for the context. These solution-based strategies apply so called product focused or result focused

[3] This paper draws on research with Boots the Chemist UK to understand relationships between the elements that constitute the practice of hair care at home in order to develop opportunities for design. The study is based on depth interviews with 24 women between the ages of eighteen and sixty-nine and interviews with hair care experts.

approaches (Fletcher et al 2001). While they sometimes address ways of satisfying needs these are often questioned in relation to lifestyles and behaviours understood through values and attitudes rather than through the patterns and assumptions that determine habits and routines.

Product focused approaches to promote sustainable behaviour may disregard the fact that products are not used on their own but are part of everyday practices – they have a cultural and physical setting. Shove cites studies of technology to highlight the limitations inherent in analysing objects, their acquisition, use and disposal in isolation, without investigating the 'reconfiguration of ideas, actions and habits' connected with their use and appropriation (2006). Everyday activities and products can be distinctly unspectacular. These mundane parts of our everyday life can consist of taken-for-granted routines that are often so 'built-in' that we hardly ever reflect upon them. What people do with their hair, or how they interact with plastic goods are determined by competences, knowledge, past experiences and the temporal, sensual, contextual and emotional arrangements of everyday life; they constitute 'practices'. The paper concentrates on 'practice' in the sense found in the sociological study of culture in the work of Bourdieu (1977) and others. Andreas Reckwitz suggests that such 'practice theory' offers a view of human actions where cultural practice is the 'site of the social' and distinguishes it from theories of culture that emphasise mind, discourse and interaction (Reckwitz 2002: 241). For Reckwitz a 'practice' is

> 'A routinised type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge.' (Reckwitz 2002: 251)

These elements of a practice are 'carried' by individuals and they are sustained, not by norms or rational choices (2002:p252), but by routines.

To think in terms of one of the examples considered here, an individual might use their appointments during a particular week as the basis for choosing to shampoo their hair or these choices could be determined by rationalising whether it would be most 'beneficial' to shampoo hair in the evening when going on a date rather than in the morning after going to the gym. However from the perspective of practices, instead of depending on rationalisations these actions would be seen to depend on everyday routines that draw on various sorts of 'knowledge' that includes emotions. The emotional dimensions of day to day interactions with hair and hair care products discussed below both create and draw on standards that are inherent in routinised actions in the practice of hair care and govern what is an acceptable feel, smell and look for hair. These standards influence when it is appropriate to deal with one's hair and what are appropriate things to do with it; they create 'normal' standards of behaviour. Although these are more or less abstract standards, they influence us to take actions by operating through routinised ways of feeling, which accompany explicit 'reasons', and may replace them.

Both the practice of hair care and the consumption of plastic goods use up resources and therefore have environmental impacts. Given that emotions are one factor that constitutes practices, the rate of this resource use might vary depending on the intensity and nature of the emotions that accompany them. 'Practices' reproduce and change through time (Shove 2006). Reckwitz notes that practices can change through 'ruptures' in the routines that sustain them (2002) and in principle such ruptures could include changes in the emotions that are part of practices – if we feel differently about what we do, what we do might be different. Also, and importantly from the perspective of design, practices and our material surroundings constitute each other, so changing our material surroundings through design as well as what we feel about them, might also accompany changes to practices as a whole.

The discussion below focuses particularly on feelings about dirt, contamination and the margins of the body, which are prominent in hair care routines, and in decisions to dispose of plastic items. A notable emotion that prompts the disposal of plastic goods is disquiet that can border on disgust; a significant aspect of the practice of hair care is devoted to allaying the negative emotions that can be felt at substances that ooze from our bodies (Fisher 2004). The

aspects of hair care and our interactions with plastic goods that have environmental consequences are strongly affected by the emotions that are elicited by encounters with dirt.

Mary Douglas' famous definition of dirt as 'matter out of place', which she retrieves from a time before our modern knowledge of pathogens, is accompanied by her observation that 'where there is dirt there is system'. She suggests that 'as we know it, dirt is essentially disorder. There is no such thing as absolute dirt: it exists in the eye of the beholder' (Douglas 1966: 36). So when people wash and clean their bodies or their living spaces they are making their bodies and their environment conform to a societal pattern. Douglas illustrates this with the way that in cleaning the house we create out of a material house a home that conforms to acceptable every day practice (1984:69). The decisions we make on the basis of whether our bodies or our possessions conform to such practices are not only the 'visible statements' about ourselves that Douglas refers to. To emphasise vision and 'display' gives the impression that such decisions are restricted to a symbolic, cultural plane, when they often involve routinised sensual experiences of the materiality of our bodies and of objects which we encounter through emotions that are configured by a practice. We feel more or less good about our bodies and our possessions by physically appraising whether they fit the 'system', to use Douglas' frame, or the practice, to use Reckwitz'.

To move closer to the examples discussed below, our appraisal of the smell, touch and sight of our hair, or of the plastic objects we use, indicates to us how we should deal with them. How 'dirt' is detected and what is considered 'dirty' reveals a configuration, a system that is dynamic and changes through time, but it is important not to reduce dirt to the systems that define it – it has its specific materiality. Dant argues against reducing the appraisal of dirt to its cultural determinants, noting that as well as taking place within a cultural system, our relationship to dirt is pragmatic. When it comes to dirt, 'if [people] can see it, it is dirt or if they can smell it, it is dirt' (2004). We use our senses to make decisions on what has to be done to remove the 'dirt' and Dant (2003) warns that we should be 'cautious of any reduction to culture that overlooks prior bodily and material concerns'. Although Dant is correct to warn against such a 'reduction to culture', dirt is not limited to things which can be touched, which can be physically sensed. To perform routines in everyday practices we draw on knowledge and competences as well as being influenced by emotions. Knowledge about invisible pathogens and potentially harmful 'chemical' substances has generated a class of dirt that is invisible and cannot be directly detected with the senses – a sort of 'immaterial' dirt.

This type of dirt has no necessary connection to a particular head of hair, or a particular plastic object, drawing as it does on concepts that come from science as well as from everyday life experience. Ideas involved may be quite abstract and draw from systems of thought that have no necessary connection to the spheres of activity, the practices, in which they are influential. 'Hair that needs washing', or 'a plastic object is too dirty to be used and should be thrown away', are categories that some theoretical approaches might say are constructed in discourse (Potter 1996, Edwards et al 1995). However, for a person to experience the feelings that can accompany such things a particular head of greasy hair or a particular dirty plastic object must have existed.

These two elements, an object and a discursive formation that constructs it as 'dirty' or not, have equivalents in ways of thinking about emotions themselves. Lupton identifies a spectrum of theoretical approaches to emotions that ranges from the 'biologic' to the 'constructed'. At one extreme of this spectrum emotions are reduced to qualities of our physical make-up; at the other they are taken to exist entirely in discourse. From the former perspective, emotions 'are' in our biology, the latter takes them to be things that we 'do' in our embodied social and discursive relationships with others. Lupton argues that the discursive dimension of emotion is what defines 'bodily experience', or 'feelings', *as* emotions (1998: 24).

This dichotomy between the 'biologic'/ 'material' and the 'constructed' echoes others in the social sciences that Halkier (2006) notes are unproductive, such as 'body versus mind', 'doings versus saying' and 'individual versus context'. Highlighting the routinised performance of activities through practices, stressing their multirelational elements, makes it possible to avoid the

sterility of such dichotomies. Social practices are not reduced to discursive practices. Practices are not only forms of sayings but also forms of doing and display themselves in regular bodily and mental activities (Schatzki 2001). As Reckwitz (2002:254) points out 'discursive practices are one type of practices among others'. These discursive practices also include their own routinised arrangement of body/know-how/emotion. In this view, meanings do not necessarily depend on intersubjective agreements but are built on routinised ways of understanding and feeling. This is not to say that routine understandings and feelings are permanent, because they can change through 'ruptures' in the routines that sustain them and in principle such ruptures could include changes in the emotions associated with them.

Embodied, routinely performed interactions with palpable dirt often lead to actions with things – washing dirty hair or discarding worn objects. Where 'dirt' requires 'matter' and it's identification within practices, emotions require a bodily 'index' – the catch in the throat, the sweaty palms – as well as the routine ways of understanding them that allows us to name these physical feelings as emotions (Lutz 1985). The cases discussed below identify these feelings and the resulting emotions that lead to objects being classified as dirty with consequent use of resources as they are washed or disposed of.

2. Dirty' hair[4]

At the beginning of the 21st Century washing the hair requires synthetic detergent shampoos and hot water from either a shower or bath. Shampooing consists of a sequence of distinct steps and stages – experiencing the state of the hair, appraising it (tacitly or explicitly) as being 'dirty', wetting it, squeezing shampoo into hands, rubbing it in the hands, massaging it into the scalp, rinsing it off with water and experiencing the 'clean' hair. Depending on the person these steps might be part of the routine of evening bathing morning showering - according to Mintel (2007), 25% of women wash their hair everyday, 59% every two-three times a week, 16.5% once a week or less. Shampooing means women interact with a range of tools, facilities and fluids whilst carrying out a variety of activities in relationship to particular parts of the body, all of which involve some resource use. In interviews women mentioned three main motives for shampooing or not shampooing their hair: 'cleansing', 'pressures of time' and 'creating a new canvas'. This discussion concentrates on ideas of 'dirty' hair that lead to the cleansing i.e. shampooing of hair.

From inside the practice of hair care 'clean' may simply be the absence of palpable dirt but as the discussion above demonstrated defining what constitutes dirt is not simple. The substances that may be considered to be 'dirt' in the hair include dust and pollution but the category is particularly related to the body's own production of sebum[5]. Women refer to this oily substance either as 'grease' or 'natural oils'. It is odourless but its bacterial breakdown can produce smells. It removes static electricity, protects and waterproofs the hair and keeps it from becoming dry and brittle. Like sweat and the fungi and bacteria that live on the skin sebum is close to us, almost 'internal' as it is produced by our bodies (Draelos 2005).

Women interact with their hair with eyes, fingers and nose; seeing feeling and smelling their hair to determine when it needs dealing with. Smell, touch and sight were mentioned during the interviews when women evaluated the states of their hair and they were associated with the frequency of shampooing it. Alongside 'caring for' hair in a routine of shampooing, conditioning, drying, styling, combing and checking the style, women interact with it in an unstructured way – moving it out of the face, seeing it by chance when passing a mirror, smelling it when laid upon it and played with it when feeling bored. Women are affected by these interactions as their hair

[4] This section is based on a series of depth interviews with 25 women about their hair care routines and consequently, it refers to 'women' rather than 'people'. Some of the points suggested may not be gender specific but this would need to be further explored in a study of both men and women.

[5] Sebum is produced by the sebaceous glands and is made of fat and debris from dead fat-producing cells.

touches the skin, produces grease, changes its surface, absorbs and gives off smells. These states of hair are the standards to judge whether the look, touch and smell of hair is acceptable. Hair was described as being too 'flaky' and 'straw like' but predominantly it is 'dirty' i.e. 'greasy' hair is shampooed on a regular basis.

Women connected 'greasy' hair with other states using words like 'shiny', 'clumped', 'dark', 'sticks together', 'separate', 'messy', 'lank', 'damp', 'wet', 'flat', 'limp', 'heavy', 'plastered', which already indicate the range of sensual interactions women have with their hair. Although, smell does not seem to be used in the determination of grease, hair can absorb smells such as smoke but it does not seem to create its own noticeable smell. Although of the participants said 'it doesn't smell or you haven't got the sensation that you feel when you need to wash your armpits or your feet' but over history this was not always the case. In the mid-eighteenth century most people considered frequent washing as unhealthy therefore hair was damped with a sponge dipped in scented water to cover up smells (Trasko 1994). A convention of frequent shampooing means we seem to have lost our sense of what 'dirty' hair actually smells like - women shampoo to wash out 'immaterial' rather than material dirt.

'Greasy' hair may not smell, but it can be seen. Grease shows at the roots, changing the colour, texture and shape of the hair. This is visible not only in the mirror but also to others and is a meaningful state of hair that relates to standards that are culturally framed by ideas, routines and products. Women manipulate hair to show others who they are and to make themselves socially distinct or at least acceptable. 'Greasy' hair influences women's self-image and confidence when coming in contact with other people. As one participant put it 'if it was totally horribly greasy, then I wouldn't feel comfortable or confident with other people in the office'. Further, it is not only the look of the grease in itself that is unacceptable as it also affects the hairstyle and therefore the self-image. The only way to rescue this image is to shampoo and blow-dry the hair using the appropriate styling products to restore the feeling of 'me-ness' temporarily stolen by palpable grease.

This is not so say that women only shampoo their hair to make themselves socially acceptable. 'Greasy' hair touches the skin of our body. It becomes 'plastered to the head', 'sticks together on your face' and 'clings around your face'. Furthermore, this plastered, sticky, clingy hair is 'wet' and 'damp'; it is coated with something that can be transmitted to the skin of the face and other surfaces. There might be something about the feeling of greasy hair that touches us more fundamentally, via an emotional reaction. As one of the participants said

> *'it's not that it [hair] looks greasy or anything. It's just because I know myself that I've not took that time in the morning to wash it… Somebody else might not know that I've not washed it that morning. It's just me. I am aware of it'.*

This awareness leads to a coping mechanism that women described of tying up their hair in a ponytail – sensually 'distancing' themselves from their hair so that they don't notice the grease. This puts hair 'under control', as it is distant from the skin and the person is only aware of it when they touches it. This only seems to be a temporary solution though. During the interviews women suggested that if their hair was not shampooed they would still feel 'dirty' even having washed their body – they wouldn't feel right in their skin because the 'grease' somehow disembodies their hair.

3. Degraded plastics[6]

To relate feelings about dirty hair to feelings about degraded plastic surfaces may be counter-intuitive, but they are related by more than the fact that they both invoke categories that define what is dirty. From many of their everyday manifestations in products and packaging we

[6] This discussion derives from an interview-based study of 22 UK consumers and an online questionnaire conducted among a community of plastic mackintosh enthusiasts between 1999 and 2003.

know plastics to be useful but also highly mutable; clean but also 'chemical'; solid but also ephemeral; impervious but also somewhat absorbent. Our feelings about them are as ambivalent as is their materiality (Meikle 1995, Fisher 2003, 2004). They can perform what almost amounts to a work of purification in the form of food packaging - they contain the sticky mushiness of some raw foods functioning as a barrier to polluting substances that might contaminate food, including human effluvia. Very soon the same materials may elicit disgust as they are re-classified as rubbish.

Whether we want to keep an object depends on how it makes us feel. At the extreme an object which may once have delighted us disgusts us; we no longer want it around and have to get rid of it, voiding it from our spatial 'body' as we might spit up a piece of food we find disgusting. This disgust may be at the material qualities of the object, it may be a visceral reaction to potential contagion. Many times however, objects commit 'sociomoral' violations of the system in which they fit - we know them to be wrong not because of their materiality but because of what they are; ugly, tasteless, unfashionable (Rozin, Lowery, Haidt and Imada 1999: 374). The negative emotions that objects elicit have a material 'ground' in the person - bodily feelings of disgust that have their equivalent in the material qualities of the object - as well as a discursive element, a 'sociomoral' aspect. This paper is opening a discussion of the relationship between this 'sociomoral' aspect of an emotion about an object, the discursive formation which is necessary to turn a 'feeling' into an emotion, and the social practices in which objects exist.

Among the objective qualities of plastics that can indicate potential contagion are the evidence of dirt, wear and the palpable porosity of some plastic surfaces. The inevitable, permanent and often rapid deterioration of plastic surfaces from their initially pristine and 'ordered' state means that very soon after they are new, they begin to become 'disorderly' through wear. Plastic surfaces that are particularly porous visibly absorb dirt. Plastic electronic products attract fine dust from static and grime from our bodies as we use them, which often cannot be removed without damaging the surface of the plastic. Plastic objects show scuffs, scratches and wear in a way that is different to the quirky 'distressing' of wood or leather, which reveals the texture of the material. Because plastic is homogenous, it is only the agent of wear that defines the marks that spoil it – and wear makes evident the fact that plastic lacks its own texture. Shocks will bruise plastic objects and they may break but most do not shatter with the spectacular excitement of glass or china.

Out of these ways that plastic objects become 'disorderly', those that highlight their porosity seem to elicit particularly strong feelings. A female participant in the plastics research referred to the 'traumatised' surfaces of plastic forks and other participants referred to the way that 'Tupperware' absorbs smells and colours. This porosity is something we are aware of as we use plastic objects; just as they absorb stains we suspect that they will exude 'chemicals' that may harm us. While staining is visible, we also fear contagion by invisible chemicals – an invisible essence that inhabits plastic influences our feelings about its materiality in the manner described by Rozin and Nemeroff (1990) in the context of Hindu culture. Our fear of contagion is activated not by religious belief, but by an awareness of the porosity of plastic in the context of a system in which we believe 'chemical' substances might harm us.

4. Discussion and Conclusions

These examples are intended to show the role of emotions in actions that have consequences for resource use. They have concentrated particularly on the negative emotions that an individual feels when their unwashed hair brushes against their skin or when they run their fingers through it; when they consider whether their computer keyboard is too dirty to continue to use it; when they decide whether to reuse a 'disposable' plastic cup; when they decide whether to store some food in a reused plastic container. Mild in intensity though they maybe, everyday experience and the empirical work on which this paper draws suggests that feelings bordering on disgust are present in these encounters with hair and plastic.

The discussion at the start of this paper presented some theoretical perspectives on emotions and evaluations of dirt and offered a practice theory approach as a way to resolve the apparent conflict between approaches to emotion that emphasise either their embodied origin or their construction in discourse. Practice theory highlights the performative aspects of everyday life and the material aspects of its routinised mental and bodily activities rather than intersubjective experience and discursive repertoires. Considering the negative emotions that are part of the everyday practices of hair care or the use of plastic it seems that the 'systems' that define dirt and disorder in those practices are the routinised bodily and mental activities that transform a feeling of embodied disquiet into the emotion of disgust. From this perspective, an approach to emotions that mainly stresses their biological dimension seems inappropriate. Since practices are reproduced and change through time, then so must the 'emotional states' which we experience in performing them. Changes in these emotional states must therefore reflect changes in the routinised bodily and mental activities that define bodily feelings as emotions proper to the practice in which we feel them.

To the extent that some formulations of plastic have physical properties that are similar to the greasiness of dirty hair – the oily wet-look of pvc fabric comes to mind – there may be a degree of equivalence in the negative emotional reactions to them sketched out above. The materiality of greasy and slimy surfaces has not escaped attention as a prime disgust elicitor. Sartre associates a sense of vertigo, dizziness, with the materiality of slimy things which call the margins of our bodies into doubt. Greasy hair certainly does this by disembodying us from part of our physical self and the dubious surface of some plastics may do it too, if only by analogy. It is the palpable porosity of plastics that seems to elicit disgust – if Sartre is to be believed our feelings about the dubious margins of plastic objects mirror an uncomfortable sense that the margins of our bodies are similarly porous[7]. For Sartre (1957) this discomfort is brought to awareness by 'Slimy'[8] substances that blur the determinate boundary between our body and the outside world. In Mary Douglas words, stickiness "…is a trap, it clings like a leech; it attacks the boundary between myself and it." (1966: 38). The 'slimy' threatens a horrific dissolution of the self into the matter of the world.

From the point of view of this discussion of how it is appropriate to treat the emotions that are part of practices it is the theoretical point that Sartre makes about 'the slimy' that is relevant. He suggests that the 'psychic meaning' of its materiality *'is identical with'* its symbolic value; in other words for this emotion he allows no distinction between materiality and system, materiality and socio-moral context, materiality and discursive formation, materiality and practice (Sartre 1957: 606). There is an echo here of Dant's warning against a reduction of dirt to culture, but in a rather more extreme form, which is in direct conflict with the principle that emotional states operate as part of historically specific practices. Sartre is not wrong to point to the power of disgust at substances, sensations and ideas which compromise our sense of the boundaries of our bodies to affect us, but the limits of this power are indicated by his abstract formulation of the cause of such feelings. His use of an abstracted 'slimy' artificially divorces such feelings from any particular slimy object or experience.

Such feelings are never so divorced. We are always disgusted at something and our feelings of disgust do reflect the cultural patterns which that 'something' inhabits. So while our readiness to clean, to order, to discard, to renew does certainly depend on our reactions to the materiality of our surroundings, or even parts of our own bodies, these reactions are more than their 'psychic meaning'. They are embedded in the practices that give them the meanings on which we act – practices operate in what Raymond Williams (1961) called 'structures of feeling' – and they depend in turn on the materiality of the technical components of practices; the particular formulations of hair care products and of plastics.

The impact of this insight on resource consumption is that it dislodges the emotions from the biological sphere into the cultural – emotions are things we do and they can change along

[7] Historically, this belief influenced bathing practices (Shove 2003).
[8] Translated from 'visqueus'

with practices. 'Systems' that define dirt and disorder in practices are rooted in routine structures of mental and bodily activities that can break and shift through what Reckwitz (2002) calls 'everyday crises of routines'. In hair care ruptures in routines occur frequently through for example a new haircut however they hardly ever influence our shampooing frequencies. The sensations of not feeling right in your skin seem deeply rooted in our emotions and therefore difficult to change. On the other hand, over history our washing behaviour has not always been as frequent as it is today. Various haircuts in the past were so time-intensive to create that women slept in uncomfortable positions in order to be able to 'wear' them for a few days therefore washing the hair was not considered and grease tolerated. Further, the life of a 'disposable' cup could become part of our routine of having summer barbeques and not be regarded as 'rubbish' after once being handled but be washed and used in the future – it becomes part of an altered practice. So how we feel about the state of our hair, of our bodies, of our possessions can change.

Future work would needed to be conducted to make it possible to suggest more specifically if ruptures in emotional states that lead to changes in everyday routines can actually be 'steered' towards less resource intensive practices. Emotions are only one element of a practice next to for example knowledge. These elements cannot be reduced to each other, as the change of one element influences the practice of a whole. Therefore a multi-relational understanding of practices is needed. Overall, what is considered 'normal' would need to be re-conceptualised. This could be based on the encouragements of a multitude of meanings and standards for what it is to have 'clean' or 'dirty' hair or when plastic goods are too 'distressed' to use, which could be induced by design.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Surrounded by high-tech environmental persuasion

Possibilities for new expressive surfaces

Joana Hipólito[1], António Câmara[2]

Abstract

The role of design as the link between products and consumers with rising public environmental concern, has given it a central position towards the development of new environmentally conscious tools for motivating behaviour changes.

Designing persuasive tools and interfaces that positively motivate consumers' environmental behaviour change is the goal of our research.

A case study illustrates the use of new expressive surfaces to support energy conservation. An environmentally friendly wall illuminated light switcher tool for providing sensorial feedback on energy consumption was designed.

Potential adult consumers were involved in a concept perception study.

Obtained results are encouraging and support future research that includes prototype user studies and the exploration of more expressive surfaces for environmental persuasion.

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1. Introduction

Nowadays, governments and other social and economic partners strive to demonstrate their environmental credits. On the other hand environmental problems attract high levels of popular concern. Although there is a consensus that environmental problems cannot be ignored and that a new sense of involvement emerged it is not always easy to individuals to change behaviours towards sustainability.

The transition towards sustainability involves social learning within communities. Improving healthy life styles (e.g. active day life, healthy food, not smoking) and, at the same time, consuming less environmental resources (e.g. energy, water) are some major contemporary goals to be reached.

In the energy sector there are significant changes around the world, in Europe and also in Portugal. Governments set goals for reducing energy consumption until 2015. For this, stimulating the use of new technologies, improving organizational processes and also changing behaviours and values towards more sustainable consumption patterns are some of the social and economic topics in the agenda. The energy challenge requires acting in several fronts, such as promoting energy efficiency, and the public must be aware, involved and prepared to participate.

This is an important message that must reach the public and consumers. In the last decade many efforts for communicating appropriate environmental behaviour were made. Still at the present time, information is communicated face-to-face in schools but also through community flyers, media campaigns or ads. Actually, we live in a world overflowing with sensorial information that, by claiming consumers' attention, tries to change their behaviours.

However, although environmental information is already available, a step forward must be taken to reach sustainability. This step leads to the promotion of environmental positive behaviour changes and to sustain the positive environmental behaviours achieved for instance in the area of everyday life resources sustainable consumption.

To accomplish this, new tools can be designed to support increased environmental awareness. These new tools are designed as environmentally- conscious tools and embody the high importance given to environmental matters such as reducing resources consumption. Their designs focus on multi-purpose adaptability. Interactive sensorial feedback is added as a response of resources consumption with minimal use of materials to increase simplicity. The designed sensorial argumentation becomes products added intelligence and intends to promote sustainable consumption augmenting consumers' awareness, involvement and participation.

A design research framework that addresses the challenges of motivating environmental behaviour changes and, at the same time, explores the opportunities that arise from the present technological and cultural evolution is needed. The creation of such framework requires addressing the following questions:

- How to motivate behaviour changes in order to become more environmentally responsible? Can new expressive surfaces contribute to increase environmental social behaviour learning?

- How can objects surfaces accumulate new performance qualities and become privileged interfaces for dynamic sensorial visualizations with aesthetic, emotional and persuasive qualities towards sustainability?

We foresee a sustainable reality scenario as a research territory in which new technologies are applied to create innovative sustainable meaningful solutions that allow motivating positive behaviour changes. In this future scenario, individuals are surrounded by

high-tech environmental persuasion argumentation that is embedded in objects surfaces, making them expressive, sensitive and communicative.

Our ongoing design research framework focuses on the development of original Environmental Persuasive Interfaces (EPI). These interfaces provide just-in-time environmental persuasive argumentation in the form of sensorial visualizations (e.g. visual and sonic) helping consumers and families to achieve friendly environmental behaviours.

As a strategy to sustainability we intend to reinvent, re-use or upgrade existing products. We illustrate potential future applications through the rapid fabrication of prototypes.

In this paper, a wall illuminated light switcher tool designed to provide sensorial feedback on energy consumption is presented. Additionally, potential adult consumers were involved on a concept perception study and results are summarized.

2. New expressive surfaces for environmental persuasion

Advancing successful and innovative sustainable tools and solutions for motivating environmental behaviours changes is based on technological and cultural research.

Before presenting sustainable alternatives to consumers, profound conceptual and applied research must be undertaken. Consumers want to participate in the sustainability challenge and they will accept solutions that help them to achieve sustainable results.

In order to build a design research framework to support environmental behaviour changes, finding what peer research groups around the world are developing is fundamental.

In this paper, due to its proximity to our research, we have selected three peer research approaches: 1) Sensorial interfaces; 2) Persuasive technology; and 3) Ambient information displays:

- *Sensorial interfaces*: augmenting objects surfaces with information makes them go beyond their physical constraints and creates sensorial mappings (Chang and Ishii, 2006) enabling new ways for interactivity. These authors propose sensorial activity theory to relate multi-sensorial mappings to the context of device physicality and rituals of use. They define a new class of interfaces, called sensorial interfaces, which articulate information expression across modalities. They advance that designers of these interfaces are less concerned with designing new physical forms for manipulation of digital information, but rather, are concerned with expanding the expressive capability of familiar artefacts.

- *Persuasive technology*: if the added information has persuasive quality the expressive surfaces also contribute to the persuasive technology (Fogg, 2003) research area. In the nineties, Fogg coined the term “captology” which refers to the study of computers as persuasive technologies < http://captology.stanford.edu/>. This includes the design, research and analysis of interactive computing products created for the purpose of changing people’s attitudes and behaviours. This is a research area that continues to grow quickly. More computing products are designed to change what users think and do, and persuasive technology applies to many areas of life. Whenever there is a need to change what people believe in or how they behave, persuasive technology may very well play a role.

- *Ambient information displays*: within an environmental framework, an inspiring example is The Power-Aware Cord (Gustafson and Gyllensward, 2005) that is a redesigned power strip that acts as an ambient information display for increasing energy awareness by showing with light the energy that is passing through it in a given moment. This is done by dynamic glowing patterns produced by

electroluminescent wires molded into a transparent electrical cord. They argue that using light is a more natural and intuitive way of symbolizing energy than Watts on a numerical display. In this paper, they present the use of information technology and design in an electric product with an ambient interface that is both simple and intuitive for everyday use and learning in a domestic context. The authors have been involved in developing new ways of representing and interacting with energy in electric products intended for domestic environments. Their prototypes are used to investigate how such ambient displays can be used to increase energy awareness.

Tools for giving feedback on social behaviour that intend to motivate positive behaviour changes are in tangible development. This supports the research on new expressive surfaces and sensorial feedback tools design that, once welcomed in the real world, intend to persuade to take sustainable environmental behaviours.

Our research territory includes a sustainable reality scenario in which new technologies are applied to create innovative sustainable solutions to motivate positive environmental behaviour changes. In this scenario, consumers are surrounded by high-tech environmental persuasion that is embedded in objects surfaces, making them expressive, sensitive and communicative.

3. A design research framework to support environmental behaviour changes

Our ongoing design research framework focuses on the development of sustainable solutions for motivating environmental behaviour changes. We propose the development of original Environmental Persuasive Interfaces (EPI) contributing both conceptually and practically for the development of new human-computing interactions.

The proposal of a design research framework that explores the development of EPI comprises four major steps: 1) Analyse the issues involved in environmental behaviours, namely individual actions and motivations; 2) Propose new concepts to explore the potential of innovative EPI; 3) Evaluate prototype fabrication feasibility; and 4) Reflect on the requirements of EPI to be developed:

- *Analyse the issues involved in environmental behaviours, namely individual actions and motivations*: this refers to principles related to individuals' relationship with nature and environment (e.g. resources conservation, recycling actions) and to further social and economic issues (e.g. education, community promotion, people involvement).

- *Propose new concepts to explore the potential of innovative EPI*: being aware of our peer research groups work (see Chapter 2), this refers to advancing innovative sustainable concepts such as *environmental behaviour sensorial feedback tools* (Hipólito, 2008). These tools intend to positively motivate consumers' environmental behaviour change. In our research approach we design sensorial argumentation that becomes products' added intelligence and intend to promote sustainable consumption by augmenting consumers' awareness, involvement and participation. It is relevant to stress that consumers' reaction to the sensorial feedback is directly supported by their senses. Sensations are absorbed and used to interpret the sensorial message. This is an intuitive approach that possibly motivates reflection upon resources consumption leading to positive behaviour changes.

- *Evaluate prototype fabrication feasibility*: this refers to analytical information regarding systems and tools specifications, planning and modelling, prototypes development and finally testing. The use of non-traditional pervasive computing (e.g. LED,

electrochemical, photochemical) that enables visualizations embedded on common surfaces such as textiles, boards or paper is encouraged. Testing is an essential phase and must include end users from the conceptual perception initial studies to final hands-on prototype testing approaches.

- *Reflect on the requirements of EPI to be developed*: this refers to resources selection (e.g. water, energy), contextual information (e.g. domestic, public) and user targeting characterization (e.g. age, education). It also includes reflections on the technological development side such as visualization options for the expressive sensorial persuasive argumentation (e.g. visual, sonic).

These four sets of interrelated steps constitute the basis of our development of EPI supporting the promotion of environmental behaviour changes.

We research, experiment and develop new concepts and techniques in non-traditional pervasive computing (Câmara, 2005), together with other research partners, to create distinctive interactive products for inspiring people to become more environmentally responsible and to learn how new interactive techniques motivate behaviour changes.

As a strategy to sustainability we intend to reinvent, re-use or upgrade existing products, focusing on multi-purpose adaptability, with minimal use of materials to increase simplicity. We then illustrate potential future applications through the rapid fabrication of prototypes.

Perceiving new ways of motivating environmental attitude and behaviour changes based on human-computing interactions increases the ability to develop new environmental persuasive interfaces.

Advancing novel techniques that support the design of new user experiences and innovative products and interfaces is fundamental to the overall success of our proposed research.

4. The use of technology to create expressive surfaces

A case study illustrates the use of new expressive surfaces to support environmental persuasion for promoting energy conservation: Wall Illuminated Light Switcher Tool (Hipólito, 2008).

Illuminated apparatus for enabling persons to readily locate a wall mounted light switch when entering a dark room are not new. Additionally, visual dynamics such as automatically emitting light when the room is dark and ceasing emitting light when the room is well lit or flashing in the dark to provide eye catching signals are already available.

However, creating an illuminated light switcher tool for enabling consumers to become aware of the energy consumption when lights are lit is novel and represents its adaptability to a different purpose.

Wall light switchers are used everyday, their face plate act as displays and incorporate the needed electricity to activate sensorial and expressive visualizations. Expressing on the apparatus surface consumption time or energy quantity in an intuitive way (visual or sonic) may contribute to augment energy awareness and possibly change behaviours.

The first prototype design simulates energy consumption sensorial feedback using commercially available green-yellow-red LED as actuators forming a ring display. It intends to express consumption time by starting to emit light, clockwise, when the room light is on and after a period of time.

The added sensorial feedback expression is disabled once the room light is turned off. In order to experiment LED functionality a 9V battery activates LED embodied in a common light switcher (Figure 1).

The light switcher adopts a revitalized look, communicating sustainability just-in-time with simplicity. By representing the consumption time in a sensorial way it makes consumers react inviting them to reflect upon energy consumption. This may promote sustainable consumption behaviour.

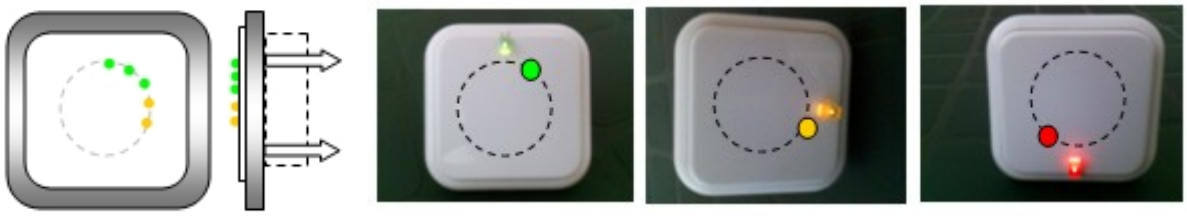

Fig. 1: Wall illuminated light switcher prototype: drawing and LED functionality experimentation.

Further prototype developments include electronics design for adjusting adequate voltage in real settings (batteries are not the best solution) and feedback design for expressing, for instance, energy consumption quantity depending on the light bulb.

An informal research was run involving 15 potential adult consumers (4 female, 11 male) in group meetings. This research intended to answer three questions: Are environmental behaviour feedback tools welcomed? Is the concept of expressing interactive sensorial arguments understood? Are ring displays a convenient visual option? To promote the discussion, PowerPoint slides with the research framework and examples of sensorial feedback tools were presented. Material for hand exploration was available supporting the discussion. The meetings took place in a relaxed way and everyone was encouraged to interrupt with questions or comments.

The following results were obtained. Overall, sensorial feedback tools were welcomed and referred to be helpful (and possibly also playful) within family environments with children. Consumers demonstrated adequate perception of the proposed behaviour feedback expression. The ring form was recognized as to be related with consumption over time as intended. Colours availability and contextual visual communication (e.g. using rings, bars, or lines) are topics for further research.

Concept perception studies results suggest that these innovative tools are powerful sources for environmental persuasion contributing to augment environmental awareness, participation and involvement. However, sensorial visualizations design should be highly considered, once such data is crucial to the application success. Beyond concept perception, prototype user studies are being implemented to find out how useful and informative users find the feedback.

5. Conclusions

The role of design as the link between products and consumers with rising public environmental concern, has given it a central position towards the development of new environmentally-conscious tools for motivating environmental behaviour changes.

In this paper we have proposed the development of sustainable tools that intend to help communities in their transition towards sustainability. The use of new technologies applied to this aim and the creation of multidisciplinary (environmental-electronic-design) research partnerships is part of our current work. In our approach, involving academia, both professors and students, and industrial partners enable us to define our research territory and the sustainable reality scenario that guide our everyday research.

We expect then that our common research results will contribute to change and improve life styles and to promote reduction of environmental resources consumption. We are now focusing on contributing to design tools that converge to energy efficiency goals.

However, in order to address the challenges of motivating environmental behaviour changes, the creation of a design framework is required. The aims of such a framework include researching on how new expressive surfaces can contribute to increase environmental social behaviour learning or how can objects become privileged interfaces for dynamic sensorial visualizations with aesthetic, emotional and persuasive qualities towards sustainability.

In our research territory we have invented a sustainable reality scenario in which individuals are surrounded by high-tech environmental persuasion that is embedded in objects surfaces, making them expressive, sensitive and communicative. We apply new technologies to create innovative sustainable meaningful solutions that allow motivating positive behaviour changes.

Finding what peer research groups around the world are developing is fundamental and in this paper we have selected and presented three research approaches that are connected to our own research: 1) Sensorial interfaces; Persuasive Technology; and Ambient Information Displays.

The analysis of their research together with our own idea for contributing to the sustainable worldwide challenge make our ongoing design research advance the development of Environmental Persuasive Interfaces (EPI) as sustainable solutions for motivating environmental behaviour changes. We particularly design innovative sensorial feedback tools that positively motivate consumers' environmental behaviour change.

To achieve our research goals, we propose a design framework that explores the development of EPI and that comprises four major steps: 1) Analyse the issues involved in environmental behaviours, namely individual actions and motivations; 2) Propose new concepts to explore the potential of innovative EPI; 3) Evaluate prototype fabrication feasibility; and 4) Reflect on the requirements of EPI to be developed.

In this paper, the wall illuminated light switcher tool was presented to illustrate new Environmental Persuasive Interfaces and particularly innovative consumers' environmental behaviour sensorial feedback tools. The light switcher was redesigned to communicate sustainability just-in-time with simplicity. It represents the consumption time in a sensorial way (using LED) making consumers react and reflect upon energy consumption.

These kinds of intuitive expressions may promote awareness and maintain sustainable consumption behaviour.

The changes that are needed in consumers' environmental behaviour clearly support the research on new "hi-tech-design" associations in order to create innovative environmental behaviour feedback tools.

A key factor to the design of these tools for the real world is that individuals capture its purpose and react to given sensorial feedback positively, understanding its meaning.

The implementation of systematic prototype studies is part of future research as well as advancing other functional environmental sensorial feedback tools.

As a final point, the development of new expressive surfaces for environmental persuasion may create real future opportunities in the social and business domains.

The following issues should be addressed 1) Explore the potential of new expressive surfaces used as tools to support families to reduce resources consumption (e.g. water, electricity) and associated costs; 2) Evaluate the role of the design to contribute to more wider social learning processes; and 3) Suggestion of design research frameworks for augmenting environmental volunteer activities.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Changing the change conference
Co-Designing a Sustainable Culture of Life

Design tools: designing research methods for sustainable change

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Abstract

This paper is a reflection on research into a methodological tool for change towards a sustainable future. The paper's purpose is to communicate this metadesign project in order to open up the ideas for discussion. The project's sustainable context will be explored, as well as the role of design and in particular design research within this context by setting up the system in which design operated and the need for developing a co-design model. The paper will then outline the design-led method developed for fieldwork in Tumut ,which initiated the process of developing the method for the co-design model. The paper will conclude by considering how the model might be further developed into a comprehensive design research method.

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1. Introduction

Our *culture of life* has become un-sustainable; humanity (especially of developed nations) has formed interconnecting systems - natural, artificial and un-natural (thought, theory and concept) – supporting our everyday practices which now jeopardizes our future and the habitability of our world. We need tools for change, methods for co-designing a sustainable *culture of life*. The discipline of Design has an important role to play in developing sustainable change.

The word 'sustainability' is distinctly ambiguous; it has come to mean a kind of change (or transformation) for the better. When considering sustainability in terms of *a kind of change for the better* ambiguity is revealed in a series of question arising from contemplation of this statement; what kind of change?, what is better?, for whom?, who chooses?, how can it be achieved?. These are the questions the research community involved in sustainability is trying to determine. This contemporary struggle to determine the nature of the sustainability question is fundamentally a question about our design for the future; what do we want our future to look like and how do we transform our current present into a changed present? It is a question not just for the specialists, but for all people, since it requires a fundamental change in all of our everyday practices towards a sustainable *culture of life*. The why part of this question has been well documented; why do we need fundamental change for the better? Prominent scientific pieces from Rachel Carson's 'Silent Spring' to the Brundland report on 'Our Common Future' and a myriad of others (scientists, social scientists, design theorists, etc) have outlined why we need to *change towards a sustainable future*. They warn of a looming environmental and social crisis; climate change, food security, water wars, to name a few. The discipline of Design had a part to play in the creation of the materialistic culture of *more* which has contributed to the looming crisis we now face. The discipline of design now has a role to play in transforming our culture of life towards something more sustainable. Design's role in this transformation should not only be in developing sustainable artifacts but also in providing tools for developing sustainable change. Design can revise its practices to change the way it constructs our artificial environment of *making ecologically friendly stuff*; doing more with less, lowering energy and material intensity, recycling, reusing, multiple uses, multiple users and so on. Perhaps Design research can also offer the wider research community aid in grappling with the question of '*what kind of sustainable future?'* by sharing the design process's aptitude for *what next*.

If we see design as a kind of research (Frayling 1993, Glanville 1999, Downton 2004) "concerned with how things ought to be" (Simon 1969, 4) then from the methodology of design I propose we can develop tools for a sustainable kind of change for the better. The ensuing method form both *design-led research* and *research-led design*. In designing this method I am using what already exists within the discipline of design; a design methodology, a design process and instances of design methods. By putting them together in a coherent fashion that articulates design as a kind of research we should be able to grapple with the systemic messiness of sustainability. The development of a design guide for research, I believe, is important in terms of our own field's ability to see design as a legitimate form of research and for other fields to gain access to methods that generate a different perspective particularly equipped to deal with questions about the future.

Design for sustainable change requires a fundamental shift in the practice of everyday life. This kind of change has not yet gained the momentum needed to divert our socio-environmental crisis. We need new models of designing for change that enables *co-design* by all actors in the system of the everyday. In order to develop such a model for co-designing sustainable everyday practices we need tools that '*enable design to operate within change and influence its direction*'[2]. Such tools are already emerging from within the design field in the form of design-led methods

[2] This is a core statement in the 'Change the Change' conference outline.

such as cultural probes (examples of which include projects by Gaver et.al., 1999, Ivey et.al, 2007 and Hielsher et.al, 2007), game format (such as the Interactive Institute project *Underdogs & Superheroes*, Mazé and Jacobs, 2003) and scenario building (such as the *Sustainable Everyday: Scenarios of Urban Life* project, Manzini and Jégou, 2003). These existing design-led methods form the foundation from which the method for a *co-design* model can be developed.

2. Culture of Life[3]

Our world; in which we human beings live and enact our lives, is made up of an interconnected network of systems; *natural*, *artificial* and *un-natural*, that support our everyday practices. We live within a *natural* physicality by *natural* processes which exist despite us. We construct skins of the *artificial* (2D, 3D and 4D artifacts, from gardens to lamps to cityscapes) which re-pattern our physical world and our everyday processes that exist because of us. We construct patterns of understanding to form our *un-natural* world, of thought, theory and concept which has no physicality, existing in our minds. Our human ecology is characterized by our biological and cultural adaptations (Schutkowski, 2006), however in looking at our everyday practices the one cannot be separated from the other. Though *life* may be a biological process, there is no way of separating these biological processes from our *cultural* system. For example, a basic biological process such as eating is an extremely cultural activity and as such describing eating solely in *natural* terms "would make no sense, it would be description without meaning – as if you described a Beethoven symphony as a variation in wave pressure" (Einstein as in Suzuki et. al. 1997, 19). Thus our *culture of life* is the interconnecting system of natural, artificial and un-natural that support our everyday practices.

Our *culture of life* has become un-sustainable. Our system of living in the world, the dominant narratives of our contemporary life, are based on the notion of constant growth - '*more*'. In a finite world this culture of '*more*' can only exist until there is no more – then what? - "nothing comes of nothing" (Shakespeare's *King Lear*) so we become nothing; we fail, sink, will not last, we will not be sustained[4]. Our status anxiety (Alain De Botton 2004) is driving us to consume more, our everyday systems disconnected and wasteful, our practices dislocating our sense of being and degrading our landscapes, our semiotic pollution (Manzini 1992) deafens us and we are numbly disempowered by our *culture of life*. We need to change, to transform our system of the everyday into a sustainable *culture of life.*

The *quest for sustainability* to date seems to rely largely on education for the transformation required, such that if you educate people they will be able to perform sustainably (Hobson 2006). If we ask people to re-think each action they perform, as sustainability currently seems to necessitate, then this very quickly becomes overwhelming. This is not normally how human beings achieve their everyday activities; these practices for the most part are placed beyond conscious thought by being embedded in culture[5]. Hence instead of seeing *popular culture* as the enemy (demonized for proliferating an un-sustainable culture of excess) we perhaps need to see it as the kind of pathway that can lead to sustainable change.

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[3] The phrase '*Culture of life*' comes from my search for an appropriate metaphor of a systems approach for Design to tackle the complex messiness of sustainability. In following Ulrich's argument that "the systems concept remains an empty abstraction so long as it is not linked to some root metaphor" (1983, p.317), then Design needs a 'root metaphor' in which to align its systems approach; one which includes motivation and purposefulness inherent in the social systems of design. In choosing a systems metaphor more appropriate than 'ecology' (such as in 'ecology of the artificial' previously used by design theorists like Manzini to initiate a systems approach to design) we could borrowed from Moscovici's phrase '*culture of life*' (as in Whiteside 2002, 17). In this way 'culture' could be used as the metaphor of a network of interconnecting systems that forms patterns inherent in the practices of humanity. The '*culture of life*' then, implies the network of interconnecting systems that characterise a way of life, an interplay of natural, artificial and un-natural systems enacted to form our everyday lives.

[4] The Concise Oxford Dictionary tells us that *sustain* is to "1. Bear weight of, hold up, keep from falling or sinking…2.Enable to last out, keep from failing" (1964, 1303) hence if we are not able to change to a more sustainable culture of life we will no longer be able to do any of these things *sustain* describes.

[5] This statement is an anecdotal assertion on my behalf which needs further work.

Design is particularly apt in seeking methods for *pop-cultural* transformation; using transgression, luminal notions, play, imagination, translation and integration. At their best these designerly abilities can be innovative, culturally rich and sophisticated or at their worst banal, superficial and trivial[6]. Hence a guide for design-led research which incorporates research-led design; each and both at once, could maximize the designerly abilities of the methodology.

3. Design-led Research and Research-led Design

The word 'design' is used in a variety of ways to mean multiple things; a profession, a discipline, a process and even an artifact. I will refer to the profession/discipline as 'Design' and the process as 'design', I will avoid the meaning of design as an artifact, apart from noting that its use in this way highlights a primary misconseption and preoccuption of the field. Design often serves to accelerate unsustainable processes through its preoccupation with 'stuff'. Like an 'object fetish' of beautiful photogenic artifacts placed on a pedestal against a white background, as apparitions without any socio-environmental context (Jones 1990)[7]. Design's move towards a sustainable practice was documented in the Munich Design Charter of 1991 which initiated this shift through the notion of 'the ecology of the artificial'. This caused the re-orienting of design away from the object and towards a systems approach; of everyday practices which the artefacts of design facilitate.

Non-object oriented design, focuses on design as a process that facilitates our *culture of life* instead of concentrating our attention on the artifacts created. In order to reflect on the systemic nature of design I have attempted to consider where the design system sits with in our human ecology (see *Figure 1* below). Human ecology can be characterised as human society, cultural systems, biophysical systems, the rest of the biosphere (Boyden 2004, 30), including our social activities, institutions, artifacts and so on. Our *culture of life* looks at the particular way we live within our human ecology (as the interconected natural, artificial and un-natural systems that makes up our way of being in time and space). Our *culture of life* is both the context of social activity and facilitated by social activity, where design is one part of our social activity. The design act of 'doing' could be seen as an element in a *social activity* process within the *culture of life* acting to intergrate the natural, artificial and un-natural systems. This could be described as a cyclic process were we understand and act in our natural world through pattern recognition, forming our un-natural world of thought, theory and concept, we use our un-natural world for doing; of designing and making, which forms our artificial world which in turn re-patterns our natural world.

[6] Characterised by Manzini as "superficial, 'photogenic' styling" (as in Jones 1990, 17) and by Frayling as "style obsessed" and "trendy" (1993, 3).
[7] These ideas are raised by Manzini in an interview with Jones for the *Design* journal article (1990).

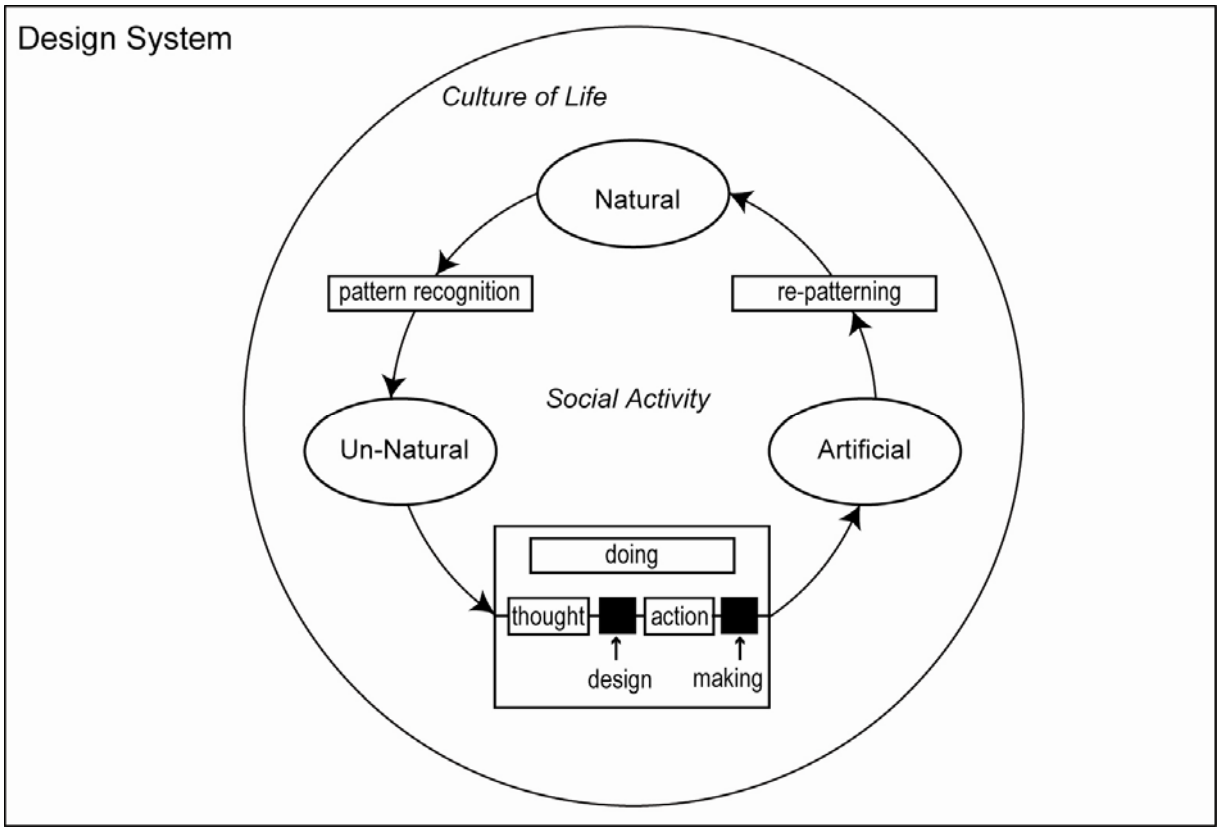

Fig. 1: The Design System - design exists within the system of the culture of life and performs a vital function in bridging the gap between thought and action which not only directly produces artifacts but also enables the system as a whole.

By concentrating our attention on Design artifacts only looks at a small fragment of the system that forms the bridge bettween thought and action. Although artifacts are a direct product of converting thought into action this brindge is also a vital link in the overall system, playing an important part in how we re-pattern our world and thus how we exist in it – *our culture of life*. Although their is a need for sustainable artifacts, their is a greator need for a sustainable *culture of life*. From this need arises an oportunity for Design to contribute to research into the whole system - to grapple with the question of '*what kind of sustainable future?'* - by sharing the aptitude of design for forming a bridge bettween thought and action. If we see design as a kind of research then the methods of design can be used as a tool for sustainability research.

Theorists such as Glanville and Downton (influenced by Frayling) propose design as a methodology and the design process as a method of research; they frame this sentiment 'design as research'. Design-led methods have the potential to offer new perspectives on sustainability research due to the nature of design thinking. Design thinking (both within the discipline and the activity) focuses on a process concerned primarily with generating 'what could be' rather than 'what is'. For the Design field, knowledge is enacted through a process characterised by identity, praxis, playfulness, constructivism, a fluidity of meaning and dynamic variability. The practice of design could be described as an iterative process flowing through phases which can be loosely defined as brief, background research, concept, concept development, design outcome and presentation. The creative process of translating one phase into the next is unique to each designer (Downton, 2004). The identity of the designer is embedded in the design process hence repetition of the process by a different designer yields variability. For the designer the process of thinking through a design is enacted, 'thinking by doing'. I believe this is an important element

shared by many creative practices where the thinking happens in the process of construction. It is about submersing oneself in the process, not pre-empting the outcome. It is a conversational[8] process between knowledge and practice – praxis. For example the process of sketching could be thought of as a conversation; in a sketch you may have an idea of what you might like to draw, you make a mark on the page, you look at that mark, it tells you something which you respond to by putting another mark on the page in relation to the first, you look at these marks which tells you something about their relationship to each other and the page, so you add another mark and so on (the final sketch may or may not turn out how you thought at the start depending on the decisions you made a long the way in response to how the conversation went). The design process can also be described as 'playfulness' with many things tried, not out of an expectation of their success instead to see if they bring something unexpectedly fruitful. Design can be considered a 'quintessentially constructive activity' (Glanville, 2006, p.62). If, in simple terms, constructivism is about constructing meaning in the world then Design is more interested in the construction than the meaning generated and hence Design generates 'knowledge for acting' rather than 'knowledge of what is' (Glanville, 2006, p.66). The aim of design is not to uncover 'the truth' but to propose 'what next'. If design is a kind of research (as Frayling 1993, Glanville 1999 and Downton 2004 suggest) then how can we articulate this?

To articulate design as a research methodology for sustainability I have engaged in a metadesign project to develop design methods within the design process to form a coherent guide. Such a design guide will outline not only *design-led research* but also *research-led design*. Hence design is being used for research and research is being used for design. If we are to develop a model of design research for sustainability we need to consider the specifications rising from the sustainability questions; what kind of change?, what is better?, for who?, who chooses? and how can it be achieved? These sustainability questions are not just for the specialists but for all peoples since it requires a fundamental change in all of our everyday practices towards a sustainable *culture of life*. Hence we need a co-design model of design research.

4. In Search of a Co-Design model

Recent models of designing for sustainable change have not gained the momentum required to generate a fundamental shift in the practice of everyday life. Currently the process of designing for change often follows a model (see *Figure 2A*) where the 'expert' is employed to insert innovation into current practice. This frequently leads to a disordering process culminating either in changed practice or in cycling back to either re-designing the innovation or reverting to current practice.

[8] The idea of the conversation comes from Glanville, although I like to explain design as a conversational process in a slightly different way.

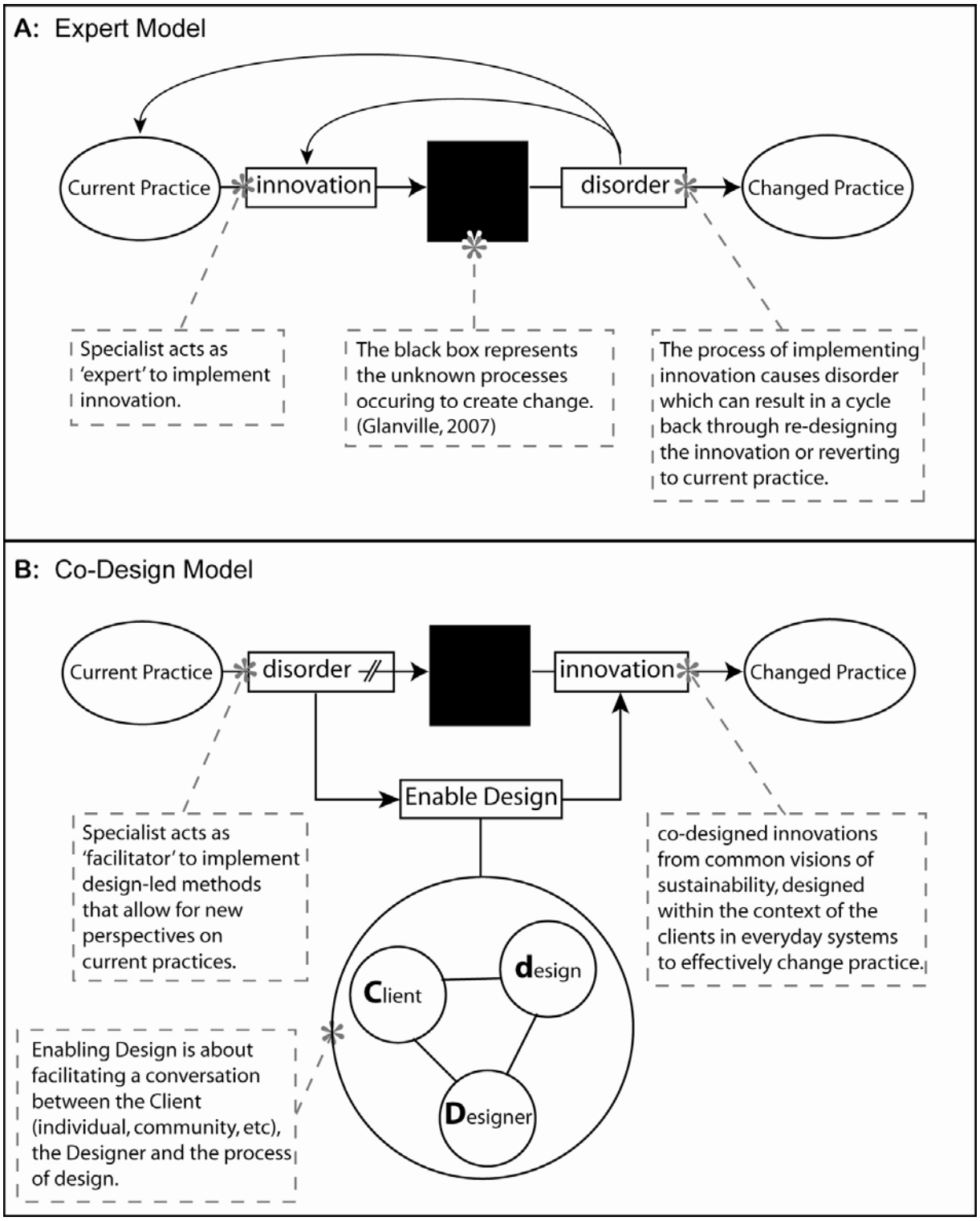

Fig. 2 – A: The 'expert' model for implementing change. In this model the specialist acts as expert to design for innovation towards change. This model has not been effective in creating the momentum needed for fundamental changes towards a sustainable '*culture of life*'.

– B: The 'co-design' model for enabling design towards sustainable change. This is an example of a model that may have potential for engaging all in the design of changes in everyday practice towards a sustainable 'culture of life'.

Designing for sustainable change requires a fundamental shift in the practice of everyday life. This kind of change has not yet gained the momentum needed to divert our socio-environmental crisis. We need new models of designing for change that enables 'co-design' by all actors in the system of the everyday. One such model could be created through the manipulation of the above 'expert' model, transforming it into a 'co-design' model (See *Figure 2B*) by swapping 'disorder' and 'innovation'. In this case the specialist becomes a facilitator (rather than expert) in enabling design towards changed practice that would engage all (community, business, specialist and so on)[9] in the process of sustainable change. The purpose of starting with 'disorder' is to implement a break with current practice allowing people to see their everyday practices from a new perspective and thus able to imagine change. Then, through harnessing the creative energy of the community in imagining change, people can be enabled within the design process to develop innovations (Maase & Dorst, 2006) leading to changed practice towards a sustainable 'culture of life'. These ideas are already emerging from a systems approach to design research as explored in a variety of different design projects based in Europe.

A systems approach to design has focused on bottom-up initiatives that explore the idea of open-source design through co-creation approaches to participation (Maase & Dorst, 2006). Methods for such an approach have been developed from the creative process of design and are considered as design-led research methods. Examples of design-led research methods include; cultural probes (examples of which include projects by Gaver et.al., 1999, Ivey et.al, 2007 and Hielsher et.al, 2007), game format (such as the Interactive Institute project *Underdogs & Superheroes*, Mazé and Jacobs, 2003) and scenario building (such as the *Sustainable Everyday: Scenarios of Urban Life* project, Manzini and Jégou, 2003). Cultural probes are creative stimuli (kits of maps, postcards, digital camera, mp3 recorder and other highly visual prompts asking you to respond in a creative way), aiming to disorientate participants into looking at their everyday practices from a different perspective when responding to the visual prompts. Game formats use game play to explore hopes, dreams and aspirations from a creative context with which participants are familiar (for example in *underdogs and superheroes* participants engaged in the game play through the context of the superhero character). Scenario building uses visualisations of more sustainable everyday practices in order to allow people to imagine possible futures (the project *sustainable everyday: scenarios of urban life* used general principles such as promoting variety, use what already exists, bring people and things together and share tools and equipment, to develop visualisations of possible sustainable everyday practices such as commuting or food preparation). Such design approaches have the potential not only for developing innovative methods for the field of design but also for generating methods that give a unique perspective to sustainability research. These existing design-led methods form the foundation from which the method for a 'co-design' model can be developed.

Taking the co-design model described in *Fig. 2B* the question emerges - how do you immerse the client and the designer alike in the design process and thereby enabling everyone in the system to design the innovation that can lead to changed practice? Design-led methods, such as the ones described above, have been developed to immerse participants in the design process. It would seem that these design-led methods explore instances in the design process (defining particular parts of the design method). If we think of the design process like a song map 'song lines'[10] guiding us through our design landscape with each part of the design process as a verse in the design song. Verses in the design process might be described as:

Brief-> Background-research-> Concept-> Concept-development-> Design-outcome-> Presentation

Perhaps design-led methods could be seen as verse fragments and hence could be put together to articulate the design process. Cultural probes could be an initial step of generating a concept, then game format could be the next step of further developing that concept, and finally scenario

[9] Brown identifies different knowledges associated with these various actors as individual, local, specialist, strategic and holistic (2007, p.31).Each of which have a part to play in sustainability projects.

[10] Indigenous Australians traditionally travelled through country using what we have come to call song lines; an oral map. The verses of the song lead the indigenous people through their traditional routes, with each verse designated for each location.

building could be a way of formulating the design outcomes for presentation. To engage in this metadesign project of developing a co-design method I used fieldwork in Tumut (a town in rural south-east New South Wales) to aid in the process of designing the method; of '*thinking by doing*'. I called the fieldwork 'Project Designing Tumut' and planned to implement 5 phases. By the time of writing this paper I have implemented phases 1 & 2 and designed Phase 3. Even though the process this is only half completed strong results are emerging in terms of how to re-asses the model and re-design the method. Below I will describe each phase and the outcomes obtained so far, leaving further detail about the results and reflections to the next section.

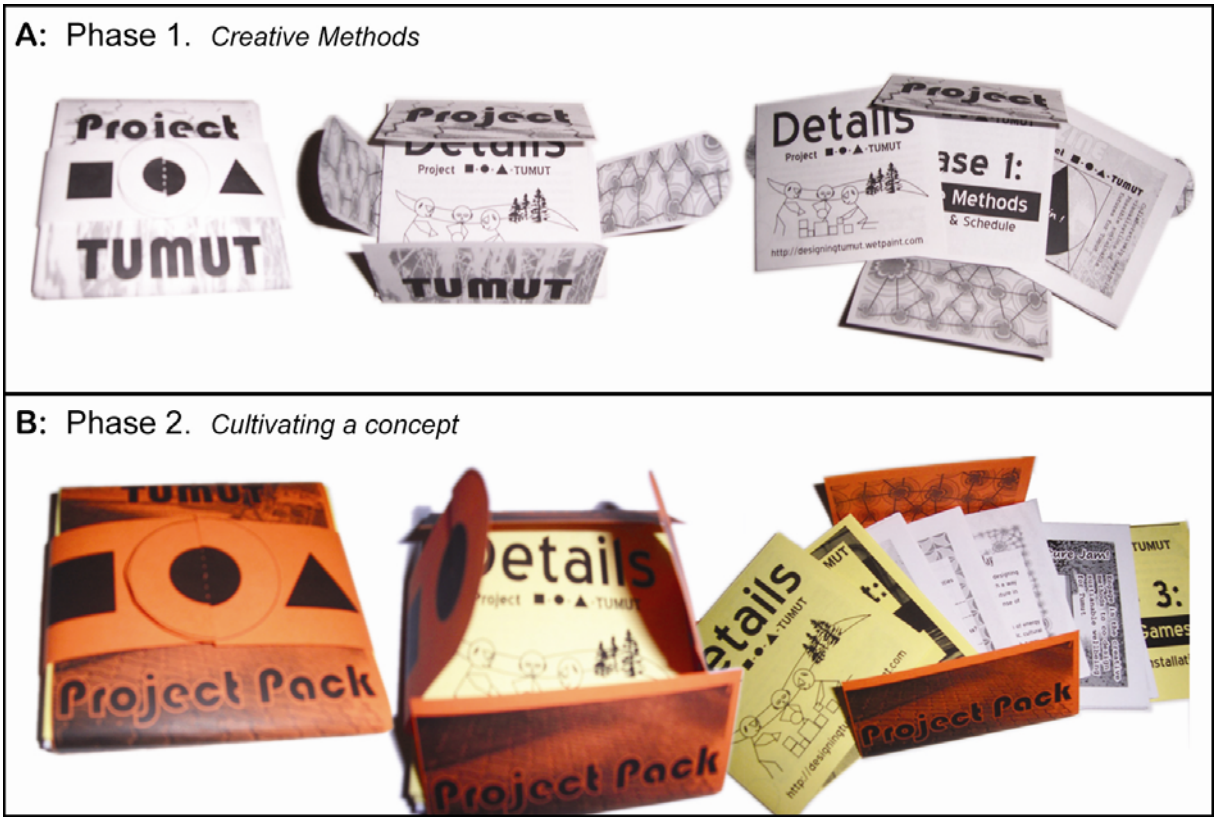

Fig. 3 – A: Phase 1. Creative Methods: Images of the gift pack given out to members of the Tumut Community in phase 1 of 'Project Designing Tumut'.

– B: Phase 2. Cultivating a Concept: Images of the project pack given out in phase 2.

Phase 1: Creative Methods

A gift pack was designed to give to Tumut community members (see *Figure 3A)* with information about the project and a creative questionnaire using cultural probe like techniques. This phase was intended to get some background information on community members. To get to know them and their ideas about Tumut and get their feedback on the different kinds of creative methods so I could design the next phase tailor made for the community of Tumut.

Phase 2: Cultivating a Concept

A project pack was designed to give to Tumut community members (see *Figure 3B)* with information on the project and cultural probe like activities. This phase was intended to harness community members creative energy in working towards a concept of sustainable wellbeing for Tumut. The project package consisted of creative activities which asked participants to look at their everyday happenings in a new way. The activities in the Project Pack were designed to extract ideas in a creative way such that participants engaging in the activities could contribute to the process of cultivating a concept for the next phase of the project. The concept cultivated from this phase was '*diversify cohesively*'. The participant responses suggested that for the community

of Tumut to sustain themselves into the future they needed to diversify their enterprises, they needed to find a balance between industry and culture in the life of the town (being primarily an industrial forestry town) and with an aging population they needed to encourage a diversity of age groups and form relationships between these groups to improve the town's vibrancy. From this concept of '*diversify cohesively*' playful interactive designs were produced for phase 3.

Phase 3 : All Fun and Games

This phase is about engaging in game play. It is about playing with the ideas that came out of phase 2 and developing them into possible sustainable scenarios. This phase aims to further develop the concepts uncovered in phase 2, '*diversify cohesively*', into a game design that enables participants to play with this concept. To do this playful interactive designs will be produced in the form of a 3D interactive object and game to be placed in one or more Tumut locations/venues. The 3D interactive object will take the form of a 1 meter tall beanbag like Tree-creature with paperclips attached to its branches. People will be asked to write stories about Tumut on green leaf shaped paper and attach it with the paperclips to the Tree-creature. These leaves will then form one set of cards in the story game. The story game has a board of butchers paper to construct the story-scape (like a mind-map) and 4 sets of cards to aid in the development of the story-scape; Tree-creature cards, link cards, new story cards and game play cards. Player use the cards to create and link stories on the board. These playful designs will engage people in the creative process of developing up the concepts from phase 2 into Visualising Futures for phase 4.

Phase 4: Visualising Futures

Phase 4 will show the visions from the communities input of sustainable wellbeing for Tumuts future. The different ideas on possible sustainable futures from phase 3 will be worked up into visualisations to be displayed in the exhibition. Community members will be asked to give feedback on these visualisations. From these visualisations one viable vision will be developed up into a final work.

Phase 5: Our Future Vision

The final phase presents the one viable vision worked up from phase 4. Key representatives from the community of Tumut will be asked to assess the viability of this sustainable visualisation for the future of Tumut.

Each phase helps to design the next phase and in this way is part of a dynamic iterative process of design. In implementing this design project also initiates the larger metadesign project of design-led research and research-led design. In initiating this process I am starting to explore the kinds of paths that can be taken, which ones take you somewhere interesting, which ones lead to a deeper understanding and which ones are easy to get lost along, in so doing I am starting to formulate how to articulate a comprehensive design research method.

5. A Design Research Method

I instigated the Tumut fieldwork to aid in the design of a method by entering into a process of 'thinking by doing'. It was not until I started implementing my design research method that I was able to determine how it needed to be designed and how the model needed to be developed. This section will outline the results from the fieldwork so far and my reflection on the process described above.

At the beginning of the fieldwork I thought about what kinds of people would choose to engage in these kinds of activities, whether it would be mainly people who saw themselves as creative or whether it would appeal to a younger generation more used to multimedia than those of the older generations who are more familiar with traditional forms of communication (this may be something I need to explore further). The main factor coming from the fieldwork and conversations with people in Tumut was the educational level required to engage in the phase1

and 2 activities. The educational bias of the method is something I need to redevelop by perhaps making the activities much more visual and much less reliant on reading and writing.

The results from phase 1 suggested the method was missing a motivational factor. I thought there might be a common concern in the community they were eager to change for the future, such as water. The Tumut river in the Murray-Darling basin, is heavily dammed and its flow is highly controlled for irrigation and hydro-electricity and has been in drought for several years. However this did not seem to be the case from the responses received, phase 1 uncovered a range of concerns none of which were drought related:

- A need to create a better balance bettween industry and culture in an industry dominated town[11] (mainly forestry with hydro-electricity, orchards and national parks).
- A need to maintain a diversity of ages in the demographics (Tumut has an aging population).
- A general appreciation of the seasonal weather expressed through four distinct seasons in the region[12] (uncommon in other areas of Australia).
- A significant commitment of time to family and sporting activities

Hence I could not rely on one socio-environmental issue as the motivating factor in my project. I needed to find a way to engage people in a project of developing ideas for Tumut's wellbeing and a sustainable future for the town. In phase 1 I tried inviting Tumut community members to a workshop and found that most people where disinclined to turn up to a workshop. In phase 2 I changed this to coffee at the local café (with only marginal improvement). I considered that perhaps there is a need to re-work the co-design model to engage more knowledge groups which may help to uncover motivations earlier on. I should also note here that this was a very small scale project only intended to initiate the process of designing the method and to shed more light on how to build the model. The project had next to no budget so I was not able to set up incentives like morning tea or lunch which could also have aided motivation. By the end of phase 1 I thought the motivational problems might be solved by a redevelopment of the model to better uncover the sustainable needs of the region. By the end of phase 2 I realized there was a need to develop the methods to open up the design conversation to all the knowledge groups and to develop the method in a more collaborative way. It became obvious that the project would have been aided by collaboration. I propose, because I do not have community consultation skills and I did not learn them in the process of becoming a designer then perhaps as a designer I need to either learn these skills or collaborate with someone who has them.

The results from phase 2 suggested that those people who participated in the phase did so in the spirit the activities where intended. Even though only a small number of responses where returned a concept was still able to be cultivated out of the replies 'diversify cohesively'[13]. I realized that because these methods where quite different from anything else most members of the Tumut community had experienced they needed more support while engaging with the activities. This meant I could not just distribute the packs and let people try and fill them out in their own time. I needed to be able to set up situations where people could ask me questions and work in groups or get ideas and suggestions from others. Having said this I was very pleased with the responses I received and I'm confident the method works in the dynamic iterative way I intended it to. Such that the concept derived from phase 2 enabled me to design the game format

[11] The main industry in Tumut is forestry with plantations and mills. There is also hydro-electricity with Tumut 1, 2 & 3 hydroelectric power stations located in the shire, the north part of Kosciusko National Park as well as apple orchards and other agriculture being a feature of the landscape (including lots of weeds like blackberries)

[12] Four distinct seasons are not common in other places of Australia like Sydney that gets only very minor variations in the seasons, usually described as only two; hot and mild. Whereas Tumut makes a feature of its autumn leaves and spring blossoms and may even get a bit of snow drifting off the main range in winter, summer needless to say is hot and dry.

[13] This concept was generated from phase 2 with some help from phase 1 as well as the conversations and observations I made along the way in Tumut.

for phase 3. At the point of writing this paper I have designed the game ready to take to Tumut for phase 3 so do not as yet have the results.

By the end of phase 2 it seemed that the process in Tumut was uncovering 'the brief'. I am keen to implement phase 3 and develop a story-scape that will work up the Tumut community's ideas. I would then like to introduce other knowledges to the model, like specialist knowledge. Perhaps develop a workshop for interested academics working on issues relating to the Tumut region and engage them in the Tumut story-scapes. I felt it was important not to bring in specialist knowledge too soon; I wanted to see what the community of Tumut thought before asking the experts for thoughts on Tumut's sustainable future. This was partly in avoidance of the expert model I described earlier and to enable design from within the Tumut system of the everyday. However in doing so I realize I had focused the model mainly on local knowledge and it needed to be open up to include specialist and organizational knowledge[14].

Design is an activity not exclusive to the Design discipline. It is a process that the wider research community enters into whenever considering questions about the future of 'what next' or 'what ought to be'. Hence I believe the design research method I am attempting to articulate gives the discipline of Design a chance to share its aptitude for design. In this way I am concerned the process described in the Tumut fieldwork above still relies too heavily on my ability to translate the participant's responses into the outcome for that phase, eg. responses to phase 1 cultivating a concept I translated the responses into the concept of 'diversify cohesively', and feed that back into the design for the next phase, eg. The concept of 'diversify cohesively' I designed into a game about making and linking stories to form a story-scape, (which also might be considered as a reliance on the cult of personality's notion of artistic genius). I still think there is a way of articulating this process so it can be of use not only to those trained as Designers who already have the skills to perform these translations. However, perhaps the answer will come in the need for collaborative sustainability projects to include a designer (or another kind of creative practitioner) in the project team to perform these kinds of translations and transformations (creative practitioners and Designers in particular are specifically equipped with these kinds of abilities and thus can effectively perform this kind of role in the project team).

The dynamically iterative nature of the design research method where each phase designs the next phase of the project proved challenging to those with more traditional notions of research. The University Ethics Committee who did not have any concerns about the project in terms of its potential risk to participants, did have some trouble fitting this iterative process into their framework. Seminars I gave at the ANU's[15] Fenner School of Environment and Society uncovered questions about what I was going to do with the data I received from each phase in terms of quantitative or qualitative analysis. I explained that I was not treating the responses as data in the traditional way, that the results of each phase would be used to design the next phase until the design outcome was achieved; in this case a visualization of sustainable wellbeing for Tumut's future to be exhibited. Design research is a different kind of research; it does seem to challenge more traditional conceptions of what research is. Through this fieldwork I am closer to being able to show that the design process can be articulated as design-led research and research-led design and is useful for brining a different kind of tool to sustainability research, although I have more work to do.

6. Conclusion

[14] Although I have focused on local knowledge the methods have also encouraged individual and holistic knowledge, the ones I feel are most missing from this project so far are specialist and organizational knowledge. Though building the inclusion of all the knowledges within the model will need to be reviewed further.

[15] The Fenner School at the Australian National University is predominantly a social science school although has a multidisciplinary agenda so is populated with a variety of other disciplines, like myself representing design. The seminar I am referring to here is the Human Ecology Forum.

The aim of this paper was to reflect on my research into a methodological tool for change towards a sustainable future and by doing so open this metadesign project up for discussion. The project's sustainable context lies with in the questions arising from *a kind of change for the better*. This is fundamentaly a design question about what kind of future we want. In this way design has something to offer not only in creating more sustainable artifacts but also in sharing the design procces's aptitude for *what next*. *Non-object orientated* design focuses on design's part in the social activity of enabling our *culture of life*. This is a systems approach to design which has been explored in a variety of European design projects utilising design-led methods. These projects have focused on bottom up initiatives and highlight the need for a co-design model of design research. I have proposed a co-design model that may have potential as a frame work for an overall design method. The method ustilises the iterative phases in the design process, the emergent design-led methods and the need for opening up the design conversation to all knowledge groups in the system of the everyday. I initiated the Tumut fieldwork in a process of 'thinking by doing' to further develop the method's design.

The Tumut fieldwork has helped to uncover how the model might be further developed into a comprehensive design research method. In re-building my co-design model I need to consider motivation, brief generation, bringing different knowledge groups into the process and developing a collaborative framework all of which I felt were lacking in the Tumut fieldwork. Perhaps the creative activities in phase 1, 2 & 3 will be worked together into the brief generation phase. Local knowledge then needs to be supplemented with specialist and organizational knowledge to better pick up on motivational factors in the local system, generate more comprehensive notions to support the creative energy of the participants and establish the context of sustainability in the region. Collaboration could also make use of different knowledges, skills and expertise, such as adding project members with community consultation and creative translation skills. The co-design model needs to consider all aspects of the system of the every day and thus needs to build in the different knowledge groups not just in the participation but also in the facilitation. In articulating the Design research method I hope to show its usefulness for dealing with *messy* questions about the future like *what kind of change for the better?* as an additional tool for sustainability research.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

ETHICS BECOME SEXY!

A critical approach to Design for the right to access to aesthetics and technology in the knowledge society

Lorenzo Imbesi1

Abstract

If environmental issues have had a prevalence to delineate what sustainable design is, we are facing the rising of further social topics somehow dealing with ethics matters, while rehabilitating to design that 90% of the people which are out of the profits of production.

If the culture of the “limit” as principle of responsibility have marked the ecological culture for a long time, giving an aesthetics for project and at the same time rejecting technology as the primary cause for environmental failure, our analysis should consider the paradigmatic shift towards knowledge society and the social role of consumption beyond need as a form of knowledge and production of culture.

Therefore, the power of access to technologies and the right to aesthetics are the challenges of design facing ethics while producing political statements. Desire and intelligence become a framework for new scenarios of development: very sexy!

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1. Introduction: a Design for the urgent majority

There's a percentage in the world which is out of any statistics, which has no weight in the numbers of marketing and production. It's a proportion of men and women which are invisible for the commercial balances and the exportations. They are people which are indifferent to any form of target and even to commercial battages. It's a society which is far away from iperconsumption and which brand is not able to place any mark but the one of need. But however it has necessities, urgencies, also desires, which "mainstream" design is not able to give answers because they are out of the numbers of consumption. It is a humanity living among the limits of survival, crowding the slums of the cities, filling the refugee camps of the old and new wars, dwelling the temporary centers of migration. They are victims escaping from natural disasters, such as hurricanes, floods or hearthwakes and arranging the favelas and the ghettos emerging in-between the interstices all over the world. It's an exceeding humanity without project and excluded from any form of project.

However, someone has evaluated this multitude amounting as the 90% of men and women dwelling the earth: they come to be an overwhelming and invisible majority resulting of nearly 1.300 million of people surviving with less than one dollar a day. One billion are without drinking water; 800 million, among which 200 million children, are malnourished; 2,4 billions are living without basic sanitary services; 36 million are affected by HIV/AIDS, among which the 92% are living in developing countries. 325 million of children cannot go to school; 46 million are victims of floods every year. These are proportions which summed together reach the big majority of the global population estimated around 6.400 million of people dwelling the earth and which live without access to everything we regard as normal, as having a repair, water and food, instruction, sanitary protection. It's the real world, as Victor Papanek would call it, which doesn't even take advantage of the attention of design research.

Design actions can have important outcomes for this invisible but real part of the word and a growing contemporary design movement is exploring new matters highly affecting social issues which the design professionals usually don't pay attention, while being interested to the 10% richer part of the world. As it can be testified by the recent exhibition "Design for the Other 90%" displayed at the Cooper-Hewitt, National Design Museum in New York, while gathering design solutions on the big issues such as water, health, energy, education, dwelling, infrastructures, which are distressing the greater part of the world population.

More than elaborating typologies of products which are already existing, as design often acts while encountering experiences of styling, they seem to be real inventions with innovative and original features and which involve together low tech technologies with industrial processes and low cost materials through design intelligence. It is often the expression of an anonymous design which isn't able to be news and whose designers usually do not appear in the glossy pages of international magazines. Even if no one will remember the name of its designers, those projects demonstrate how design can have the power to change and improve the lives of men and women, while being interested in their real needs.

2. Aims: social awareness, aesthetic responsability

The consideration of the social responsibilities of design suggests the relationship with its ethical value and impact on daily life of people, both reconsidering with a critical eye some of the categories related to sustainability which have based for a long time the ecological thinking while developing a sort of morality for the project.

The research starts from the consideration of the shift brought by the third industrial revolution, knowledge society and information technology in the forms of organization of

contemporary societies and the spaces we live and dwell. The change is modifying at the same time the global geography of development which was once cut between north and south. The rise of the global cities in every part of the world is a brand new phenomenon for bigness and density while displaying at the same time new and original critical situations which should be examined with innovative tools.

At the same time, the diffusion of new technologies spreading in the world, opens again a reflection for analysing what can be considered a sustainable technology towards which development. If helping the once called third world for a sustainable growth meant just downgrading or giving away the last but one innovation in technology or industry; the rise of new technologies, mostly connected with communication and knowledge, releases chances for development and for playing new leading roles in a sustainable way which should be investigated.

Also, one of the products of globalization is a form of culture of responsibility which generates the awareness of the local and global effects of consumption. Therefore, consumption cannot anymore be considered just as a passive act, but moreover an action which can be aware of its active role in producing skills, knowledge, as well as redirecting production itself towards more sustainable strategies for environment and society. The progressive market politization may open to new schemes and experiences of enterprise to be explored.

Sustainability has been shaped through time as a form of strict castigatory project instructed by the morality of need where desire is banned. The “culture of the limit”, which has produced a form of aesthetics to sustainability through time, should be reconsidered according to the penetration of media around the world and the diffusion of global lifestyles producing a form of aesthetic awareness and education among social strata and places. Therefore, the strict limit between need and desire should be reviewed in order to claim “the right to aesthetics” together with the basic needs for every men and women. This is one of the challenges for contemporary design: shaping an aesthetic for ethic in order to make good choices be recognized and accepted also as beautiful choices.

The research faces the conceptual relationship between ethics and design through different aspects (organization, production, distribution, consumption, …). Through an interdisciplinary theory-based and design-based approach, linking design, productive consumption, cultural studies, anthropology, the contribution will be based on the experiences of two exhibitions and a conference on the topic, while it will provide images related to product design projects which will illustrate the subject matter.

3. A question of ethics

Any good designer sustains that a likewise good project, any good project, cannot be called like that without assuming a number of features that attains to its ethical measure connected with the society and the environment where being inserted. But in addition to professional deontology, which binds individually every good professional as active actor of a society to right practices and values of general etiquette, design has a responsibility in creating the material landscape where we live, which is to say the raw material of the world, and consequently the social scenarios been shaped, while drawing the network of relationships mediating our behaviours. Then, design has to do with our material culture, meaning as a mix of men and things, matter and behaviours, living and inert, visible and invisible.

Close connected with technology, design is the way we try to solve problems, fill needs, satisfy desires, shape our world and change the future, as well as create new problems. Design is primarily an iterative and complex process which important decisions are being made related with society. As a result, design can build many important consequences on the cultural and ethical issues related to hypothetical future scenarios that somehow arise and involve actors and heterogeneous contexts. The project does not stop with the design of a shape, rather continue in

the choice of materials, as in production, distribution, consumption, even dismission, while implying an endless network of subjects, often with contradictory interests.

4. Responsible, fair and solidal

If environmental issues have had a prevalence to delineate what sustainable design is, while ecodesign approach has been developing products with low environmental impact; nowadays we are facing the rising of further social topics somehow dealing with ethics matters. Above all, the ethics dimension, which belongs philosophically to the sphere of behaviours, while setting together design and production, makes a contradiction to be solved while expecting a form of responsibility after economic profit. Specifically, the ethics of production doesn't necessarily relate itself with the social and the environmental one, while assessing only the economic factor as the only engine and principle of profitability in calculating cost-benefit of enterprises. But the growing critical conscience in consumption and its impacts on environment as on the exploitation of labour, or developing countries, on planet pollution, or the mistreatment of animals, has given the chance to emerge new opportunities for companies to work beyond the logic of instrumental rationality and economic profit, while discovering a competitive advantage in a form of ethics and social responsibility.

At the same time, the recent conscience to live in a smaller world, if on one side it awakens us regarding the limited resources available, as the social costs connected, on the other side while connecting smoothly cultures, goods, technologies, information, it gives the chance to discover new potentials for creating experiences while including entrepreneurship, production, but also widespread creativity. These can be considered opportunities that make solidarity and sustainability not just a philanthropic value, but a principle of entrepreneurial policy opening at the same time a new area of research for the project in a cultural perspective. The experiences of Corporate Social Responsibility were born in this connection in order to respond to a request for aware consumption by creating competitive advantage also with criteria which aren't directly monetary.

Design proved to be able to develop enterprises of cooperation between project and production related to sustainability and solidarity, between local and global in the direction of developing countries. Therefore, for example, North South Project involves small enterprise and local producers between Guyana, South Africa and Botswana in creating products based on the vocabulary of forms and materials of the place, but at that time direct for other and high global markets, or else the experience accomplished between research and didactic by IUAV Venice for the realization of bamboo prototypes designed by students and implemented in Vietnam by the artisans of CraftLink. While welding knowledge and manual skills, capabilities and cultures, new chances for research and creativity come out, while crossing at the same time industry and handicrafts, improving old and new materials, embedding local traditions and global cultures, ethics and techniques. The development of new product lines, designed with special attention to the outcomes for a compatible and responsible development, at the same time can be an opportunity to discover new markets while structuring systems not only for production, but also for distribution, marketing and consumption, thus appraising each section of the line, also through design, and thus constituting third forms of aggregation.

5. Post-production products

Along with the transition to the postfordist economy, the reconsideration of the limits of production, where small production increasingly varied and customizable is privileged to mass quantity, releases areas for new business practices, as for project, capable of bridging the gap between production and ethics, among the objectives of profit and those of social progress. Therefore, it can be taken as an interesting case study the experience of Cyrille Varet, a French designer who works with Wola Nani, an association of South African women infected with HIV,

which together design and work on standard incandescent light bulbs of Edisonian memory, while bringing together hand made with machine made. Almost as a metaphor of the serial product created by the Fordist mass industry, the classic light bulbs are taken as object trouveé and manipulated with innovative materials and technologies, such as colored silicones and metals, in order to elaborate special tactile, visual or colour performances. The final products are all unique pieces and at the same time serial mass-products; but moreover they mainly employ new technologies for marketing and distribution while being sold only online on the web and basically facing a global market.

This can be considered the expression of a widespread and varied projectuality, which is not just the representation of local cultures of craft, nor those of the big global multinational industry, but the result of powerful and fertile hybridizations. Those experiences have the power to invalidate every barrier established between north and south, developed and developing countries, in order to design the new scenarios of post-production products while involving a profound rethinking of the concept and modalities for enterprise and market research. They can open new systems of relations and organization while cracking common established processes of design, production and consumption and launching unexpected possibilities for creativity, as well as new markets that do not recognize the accepted principles of profitability, while introducing ethical and social criteria. Therefore, profit happens to be the result not just of strictly financial viability and economic gain, but also of quantifiable values in terms of improvement of the environmental quality, solidarity, human development or social security.

5. Mapping post-colonial scenarios of marginality

At the same time, the critical thinking on the role of design, as well of production and consumption in contemporaneity, cannot ignore the historical epistemological turn from the fordist-taylorist paradigm of mass and serial production into the post-industrial development which draws a new economic and productive geography. In a world where the industry of the chain assembly leaves space to new and more flexible forms of labour, allowing production to untie and decentralise itself from territory, the binary paradigms of centre-periphery or north-south, which have painted the maps of marginality and colonialism, cannot tell anymore the complexity of contemporaneity.

Then, a net of connected hubs designs a fluid horizontal structure without centre, delocalizing and autonomizing the activities. At the same time, a new geography of global cities is emerging while crossing and connecting the transnational market. It’s a new map which is including, after the renown London, New York and Tokyo, also places as São Paulo, New Delhi, Hong Kong, Cape Town, before considered as peripherical. Here, finance, technologies, fluxes and strategical decisions, but also an extraordinary quantity of humanity produced by migrations, are concentrating in such special places. As stressed by Saskia Sassen, those incredibly extended global cities display themselves as iperconcentrations of infrastructures and define the new scenarios where centrality and marginality are now concentrating while increasing inequalities.

If the world could be cut in two along the classic dichotomy between north and south, centre and periphery, developed and underdeveloped, colonizers and colonies, the new post-industrial geography of networks and fluxes maps a rather complex new form of development where many centres come forward as hubs in the peripherical marginal regions and at the same time on the contrary lots of peripheries can be drawn within the central key places. Thus, while squeezing dramatically together more than half of the global population, at the same time contemporary cities have the power to incrementally condensate inequalities, contrasts and conflicts, which can be seen in the concentrated depots of human multitudes which live reduced in suburbs, as well in favelas, or in refugee camps.

The issue of new technologies can therefore suggest new forms of development, beyond the fordist industry, capable to break down the classic dichotomy between north and south,

developed and underdeveloped. Besides, if global has become the way to be local, is it still relevant to make any difference between the north and the south of the world? Rather, isn't it that we can now locate as many south in the north and north in the south?

6. Power of access

If the big majority of the inhabitants of the planet will soon live in big global cities, and the trend does not seem to be near to reduce, these will be the scenarios where production and project should focus. Here, the problem doesn't seem to be just the transfer of technologies into the developing countries, moreover the risk is just to build a form of "peripheral Fordism" connected to the decentralization of the most polluting productions in the emerging industrialized countries. Moreover, it is important to build new models of development able to cross together technological innovation with intelligences and capabilities of process management. Thus, the immaterial capital in terms of scientific and technical knowledge would be involved as an important competitive factor as our contemporary society of knowledge displays. As a proof of this, it should be highlighted the progresses in technological innovation for managing immaterial information flows, attained by important investments in human resources, which have meant a chance for redemption in many emerging countries as it can be displayed by the industry of software in India. This is a recurring topic of contemporary design research which should be focused, while reflecting on new models of development connected to knowledge society. Thus, design research should aim at developing that immaterial capital as knowledge taken into account as an important factor for competition.

The technological question certainly is one of the most relevant contemporary issues at the global level which we should face: as Jeremy Rifkin stressed, poverty cannot anymore be measured just by the satisfaction of primary needs, but on access and inclusion to technologies and communication which can give a chance to societies to develop autonomously. The power of access can build the differences and inequalities while opening holes in the net: being disconnected means being excluded to the educative, cultural, informative chances which communication technologies mean, while broadening the economic and social disparity. Therefore, many projects are working to ensure digital inclusion in vast underdeveloped areas often even lacking of electricity, where breaking down technological barriers and the allocation of wireless networks may stand for the only possibility of communication and at the same time the only chance for developing programs for education, for enterprising for small companies, for the progress of small communities. As a well renown and celebrated example, the project OLPC - One Laptop for Child, which has been developed by MIT in Boston and designed by Continuum and Fuseproject from an idea of Nicholas Negroponte, is launching a challenge in order to break the technological gap while realizing a laptop powered by a hand crank and not exceeding the cost of $ 100 and to be distributed to children between 5 and 15 years old.

While drawing the new development and technological scenarios, such design experiences could have interesting outcomes back to the richer societies, while signalling new paradigms and models which can be socially and ethically alternative back also to the richer societies, while matching wellbeing and sustainability. Just imagine if suddenly millions of computers like that were distributed while being equipped with technology of the latest generation, but with open-source software and very cost-effective hardware. Just imagine if an important slice of the world was educated, would communicate and create projects, enterprises and development with such technologies. What would it be of the technological monopolies, or the exclusive software, or multinational digital services? And moreover, if spreading those new formats and digital languages take the capacity of critical mass, then shouldn't the most developed society have to adapt for once?

As well, the history of Freeplay crank radio displays a similar model which can have a meaning also for developed countries, apart from design and technology. While been developed

for African countries, for those many people who have lived the famous blackout in New York, it meant the only vehicle of information about what was happening around them.

7. Sexy, smart and profitable

Moreover, the relationship between ethics and design focuses and crosses over the issue of the aesthetics of ethics, while simply asking: is it possible for design for/of sustainability to exceed somehow the “pauperistic” aesthetics which has been historically connected with?

Hans Jonas’ culture of the “limit” and principle of responsibility have marked the ecological culture for a long time, giving at the same time an extraordinary metaphor for the design imaginary, while pointing to technology to be in charge tout court of the environmental calamities and at the same time dreaming a sort of romantic restoration to a natural condition in order to bring life back to the ecosphere. Therefore, responsibility towards future generations and the globe survival from the emergence bring towards a sort of morality of the sacrifice as the only cure which seems to be possible for the destiny of the planet.

Its related aesthetic answer is a sort of Calvinist programmatic minimalism combined with a prudence for project, the refuse of technology in favour of local handicrafts and a minimal aesthetics for reuse of thrash, both physical and moral. At the same time, the caution for project takes sometimes the risk of flowing towards a policy of “not doing” and an absence of project: as a reflex of the liven and open debate, the 7th International Venice Biennale of Architecture was heading the title “Less Aesthetics More Ethics” in the 2000.

As a result, to give evidence of a civilization of consumption and amplified glamour, as Ave Appiano stressed, the rediscovery of the "aesthetics of wreck" has been rediscovered through poor and minimal, even trash shapes, as the art already taught, which are always connected with a sort of physical and moral recovery, in order to save the refusal to new life. The desire becomes a threat to exorcise due to be unproductive waste beyond the preservation of life: *la part maudite* described by Georges Bataille through the concept of *dépense* is related to the unproductive waste matter of consumption, which is lived as an act of sacrifice and loss, but which also plays an key part as a social function in cultural rites.

But, if we cannot ignore the centrality of consumption of goods and services phenomena, beyond the utilitaristic theories of need, consumption itself cannot be anymore identified as a secondary activity from production and market, moreover able to produce meanings and knowledge. The growing awareness of the role of this activity in everyday life make take it into consideration as a form of production relating relational, technological, creative and cognitive skills. Productive consumption or “prosumerism” are the new categories which are emerging in the convergence between production and consumption leading to new forms of participation, responsibility, self-brand, lifestyles.

The boundary between users and producers of a service is blurred: it is often impossible to differentiate between those who are creating the service and those who are the consumers or users of the output. Furthermore, productive consumption and the critical awareness of the values that goods concentrate, open to new queries to be debated: what is the shape of ethics? Hence, the right to aesthetics namely employs solidarity and ethical values in order not to sentence to a structural outstanding underdevelopment for all those men and women who live excluded and indigent. Thus, aesthetics comes in the political sphere.

Quoting Bob Willard, which is an expert of company’s strategies, design should be “sexy, smart and profitable” while connecting ethics with the intelligence of new technologies, competitiveness of production and being sexy for consumption. That is to say, the future of the ethically aware project should embrace the intelligence of new technologies, the competitiveness for production and being sexy, namely assuming a persuasive aesthetics for consumption. And it is just aesthetics to play a critical role for next future for fair and sustainable project which design should give an answer. Every, any upcoming and new model of development cannot leave out of

consideration the scenarios of everyday life where they are located. Those common scenarios also employ images and shapes which are perceptible and can be recalled into mind: the aesthetic vision will give a more or less cognitive and cultural interpretation to be shared collectively or individually through metaphors and mental images. This is another issue to be queried to design project: which aesthetic expression is able to play and moreover communicate the values of equity, solidarity and respect for environment, while drawing at the same time our scenario of life for the next future?

Then, new technologies and the materials of last generation can give and interesting answer to the ethical and aesthetic scenarios which our future environments will have, while including together factors as ecology, high performances, economy, innovation, ergonomy, without renouncing to seduction. Therefore, productive consumption and the critical awareness of the values of goods ask for a right to aesthetics which can assume at the same time ethics and solidarity values in order to give a shape to the desires of “the other 90%”. Thus, aesthetics become politic. Very sexy!

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Looking for Likely Alternatives (LOLA)

A didactic tool to approach sustainability by investigating social innovation.

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Abstract

LOLA is a pedagogical tool for teachers and students which core activity is based on scouting for promising cases towards sustainability. The paper presents LOLA tools and its theoretical background, analysing is potential in shifting our society in a more sustainable direction through didactic activities.

Our conclusion is that LOLA is developing a “designerly way of knowing”. Students are stimulated to describe for each case collected: “how the initiative start”, “who are the users”, “which user need does it answer”, “what works well in the solution”, and other questions that implicitly induce students to recognize initiatives in a “solution-focused way”. LOLA promotes in students the idea that people are able to “design” for themselves, to solve problems and to live in a sustainable way.

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1. Introduction

The Looking for Likely Alternatives (LOLA) project is a pedagogical tool for teachers and students, which assists them in the process of identifying, evaluating and documenting cases of social innovation for sustainable lifestyles.

The LOLA project's goal is to help teachers and their class to discover, approach and give visibility to new sustainable lifestyles in their surroundings.

In the complexity of contemporary society, new forms of sustainable users behaviours and promising bottom up innovations are appearing. These initiatives have been carried out by communities of people who organize themselves and develop new solutions based on mutual help, collaboration, sharing, etc. On top of facing their own everyday problems, these solutions can be seen as potential seeds of new sustainable lifestyles. ***LOLA's core activity is based on scouting for promising cases towards sustainability***. ***Giving light to this kind of grass-root innovation, the pupils share knowledge developing a vision about the future and how to change our society in a positive way shifting it in a new and more sustainable direction.***

LOLA goes beyond the common pedagogical use of case studies and project work which tend to be limited to the immediate classroom context. The process brings the students into direct face-to-face contact with groups of people who question their current lifestyles.

The project aims to reach the following goals:

_ develop, as a didactic tool to raise sustainability awareness, the process of searching for cases of social innovation;

_ strengthen the processes of identifying social innovation, evaluating promising cases, clarifying the conditions requiring such innovations and reflecting on the consequences of such initiatives;

_ improve the use of ICT and multimedia by teachers and students/pupils in their work of documenting relevant cases of social innovation;

facilitate bottom-up social learning as a complement to traditional expert-driven learning;

_ motivate teachers to involve students in learning to learn from real life situations.

2. Background

The CONSUMER CITIZENSHIP NETWORK launched the LOLA project in 2005.

The CONSUMER CITIZENSHIP NETWORK - coordinated at Hedmark University College, Norway – is an interdisciplinary network of educators, researchers and civil-society organisations, (including UNESCO, UNEP and Consumers International) who recognize the pressing need for constructive action by individuals in order to achieve sustainable consumption and global solidarity[4]. The CONSUMER CITIZENSHIP NETWORK brings together expertise in the fields of citizenship, environmental and consumer education to further develop research and good practice for teaching and accessing consumer citizenship education. The Network consists of 125 institutions in 37 countries. The project targets lecturers, researchers and teacher trainers in higher education; students, professionals working with children and young people, public authorities, and associations dealing with citizenship training, sustainable development and consumer issues.

[4] Internet address: http//www.hihm.no/concit

Accordingly with CONSUMER CITIZENSHIP NETWORK goals, the LOLA project was started to adapt the needs and ways of the process of case collection by higher education initiated in the EMUDE-European research project[5], co-ordinated by Politecnico di Milano, INDACO Department. EMUDE was a programme of activities which aim was to explore the potential of social innovation as a driver for technological and production innovation, in view of sustainability. Towards this end, it looked for cases where subjects and communities use existing resources in an original way to bring about systemic innovation. In order to identify a collection of promising cases it had set up a network of observers, known as *Antenna*s, encompassing teams of researchers and students from 8 European design schools.

The EMUDE case studies – and progressively other cases collected by some research activities and workshops – compose the **"catalogue of cases of sustainable daily life solutions"** on the Sustainable Everyday Project [6] web platform.

SEP - Sustainable Everyday Project - coordinated by Milan Polytechnic University, Italy and Strategic Design Scenarios, Belgium - started in 2002 and intends to raise awareness about sustainable social innovation through various diffusion channels: a web platform

(www.sustainable-everyday.net), publications, and a series of exhibitions and local events. Most of SEP activities are based on a "catalogue of cases" which's purpose is to empower the promoters of such initiatives giving them the possibility to exchange ideas and experiences; facilitating citizens to participate to such initiatives, to involve a wider audience in a discussion on new ideas of well-being and on how it is possible to promote it starting form now.

Therefore LOLA project inherits EMUDE's didactic methodology and its participants "learn from" and "contribute to" SEP 's catalogue of cases.

3. Tools

Specific tools were designed to reach these goals. The main toolkit was called LOLA ***Teaching Pack***, which contains:

1. ***Student Reporter Book***: supports the collection of cases by the students which consists in an easy to construct booklet supporting the kids in making the interviews, taking pictures and where they are invited to write down and draw all their observations;
2. ***Step by Step Cards***: facilitate the organisation and presentation of the learning process. It consists of 5 preparation cards describing what can be done to prepare each didactic session, and 20 session cards that present alternative ways of organising each session of the investigation with the pupils:

    a) the teachers and students prepare the didactic process in order to help the students in identifying promising initiatives;

[5] EMUDE (Emerging Users Demands for Sustainable Solutions) is a Specific Support Actions (SSA) funded within the Priority 3 – NMP research area: Increasing the "user awareness" of the 6th framework. EMUDE was promoted and developed by a Consortium of European universities and research centres, like National Institute for Consumer Research (Sifo), Netherlands Organisation for Applied Scientific Research (TNO), Philips Design (Philips International), Joint Research Centre - Institute for Prospective Technological Studies (JRC-IPTS), Consumers International (CI), United Nations Environment Programme (UNEP DTIE), Strategic Design Scenarios (SDS) and others. The scientific coordinator was Ezio Manzini (Politecnico di Milano)

[6] The Sustainable Everyday Project (SEP) proposes an open web platform to stimulate social conversation on possible sustainable futures. It is organized around 3 core activities: the constitution of a Catalogue of cases showing examples of social innovation from all other the world developing original solutions promising in terms of sustainability; the organization of a traveling exhibition to meet public events, confront with close scientific communities and give visibility to new visions of sustainable daily living; the promotion of a Scenarios laboratory where new visions of sustainable everyday life are proposed and discussed. The SEP platform hosts several research activities and didactic workshops. The Platform is an organization and communication tool providing an open web space and visibility for activities relating to the fields of design and sustainability in the everyday context. SEP is an independent network funded by public research projects and organization of events. Editorial activities are based on a voluntary participation. SEP events are placed under the patronage of UNEP United Nations Environment Program.

b) the teachers organise the content of the *Reporter Book*[7] in order for the students to have guidelines for searching promising initiatives;

c) the students present potential cases in order to altogether select most promising initiatives;

d) the class prepares for the interviews in order to investigate promising initiatives;

e) the class share the investigation results in order to discuss and share what they have learned.

3. ***Guide Book***, ***Tips & Notes***: to help teachers in organizing the activity in the class a step-by-step guide showing the LOLA process was created to be used both as a reference guide by kids and a didactic guide for teachers;
4. ***Documentation form***: a form to help teachers to document the process and for the LOLA team to get feedback in order to improve and finalize the LOLA work package.

The use of ready-made formats offers information in an easily accessible and adaptable way. However, each class decide its own combination between the steps of the project for pupils to investigate their own neighbourhood, interview people experiencing more sustainable ways of living and come back with a critical view challenging their own living patterns.

A ***Tips & Notes*** booklet is being further developed to be included in the ***Teaching Pack*** in order to help teachers address issues related to sustainability. Vocabulary, some references to existing cases and links to find information about sustainability are simple but effective ways to help teachers better prepare themselves on the subject.

Currently, the LOLA project is promoting its implementation in secondary schools in and also outside Europe. For ensuring direct and clear communication paths with participating schools around the world, the role of “ambassador” was created per region or country, to simplify relations and facilitate feedback to the project. The process of recruiting ambassador’s has already begun. The first task of LOLA Ambassador’s is to communicate and disseminate the project. The second task is supporting interested teachers/headmaster in this participation, showing them the LOLA website where they can subscribe and download the ***Teaching Pack***. The last task is to report back on the participation of the different schools in your country to the LOLA team (to improve and fine tune the *Teaching Pack*) sustainable development.

For such aspects, an ***Ambassador Franchising Kit*** has been created in order to facilitate and prepare their responsibilities. The kit includes:

1. a personal letter for the Ambassador describing the contents of the kit
2. a participation certificate for the Ambassador himself.
3. a set of LOLA brochures;
4. a set of A4 prints to an easy-to-install ***LOLA exhibition***
   (this exhibition is also downloadable in the LOLA website)
5. a complete ***Teaching Pack*** sample;
6. a Participation Certificate for each school volunteering;
7. some reporting formats;
8. all material in digital form on a CD.

[7]

The documentation and evaluation of this process can be seen in two levels: as a teacher using the ***Teaching Pack*** or as an ambassador reporting a general overview of the activities in their countries/regions. This process is useful for giving visibility to the project, connecting teachers, teacher trainers and schools; generating a global perspective of what is actually happening in different contexts or society in terms of initiatives for responsible lifestyles.

In this matter, LOLA intends to connect the work of teachers from several schools through an ICT platform in a collective search for examples of universal value. The objective is to use middle level communication tools aiming to connect ambassadors, teacher trainers, teachers and its students. For this purpose, an easy to use ***Web*** *platform* in the shape of blogs is being designed to connect participating schools, respond to questions, display the found cases, capture the discussion, leave comments, download information and so on[8].

4. Phases

The first phase of LOLA was the pilot project (2005-06) as a follow up of the EMUDE research that involved the SEP actors (see section 1.3 Background). It was then organized in two parts: first generating the contents of the ***Teaching Pack*** in order to organize a method for finding and disseminating more sustainable lifestyle solutions, and a second phase involving four teachers training schools in the process of collecting these cases of social innovation, documenting the didactic process and maintaining an open discussion on the experience amongst the CONSUMER CITIZENSHIP NETWORK members.

The second part involved teacher training colleges in four countries: Belgium (KATHO-RENO, Teacher training college, Torhout); Norway (HIHM, Hedmark University College, Hamar); Lithuania (VPU, Vilnius Pedagogical University, Vilnius); and Portugal (IPBEJA, Politechnical School of teacher education, Beja) in the process of collecting cases of social innovation, documenting the didactic process and participating in discussion on the experience. The pilot project resulted in the development of the ***Teaching Pack*** which has been translated into English, French, Flemmish, Lithuanian, Norwegian, Portuguese, and Slovakian. Separate blogs were opened to collect the work of the students in each school while a main LOLA process blog was created as a reference point for coordinating the activities. The main process blog hosted communication of shared interest and, by providing the possibility of leaving comments to every single posted article, it was thought of as a trigger to exchange experiences between the pilot project's teams. Comments collected on the LOLA process blog represented the seeds for discussion about the project's further development.

An extensive exhibition of the pilot project was made for the CONSUMER CITIZENSHIP NETWORK Conference in Hamar 2006, and in Sophia 2007. An exhibition was also present in Genova 2007 for the meeting of the Italian Task Force on Sustainable Education within the Marrakech Process.

[8] Internet address http://www.sustainable-everyday.net/lolaprocess

Currently, the LOLA project has started its second phase, the ***implementation phase*** (2006-09). After the successful Pilot Process, the aim is to fine-tune and complete the material by testing it with secondary schools in Europe – possibly further - and re-evaluating through the observation and analysis of those experiences. Many actions are taking place in order to complete this task. Specifically the development of the ***ambassador*** role to help organizational and dissemination purposes; the ***Tips & Notes*** booklet to assist teachers in the usage of the ***Teaching Pack***; and a complete the ***LOLA Web Platform*** to communicate, inform and obtain feedback from participant schools. This process is coordinated by the CONSUMER CITIZENSHIP NETWORK and SEP; and it is also supported by the team of voluntary LOLA Ambassadors (who are active members of CONSUMER CITIZENSHIP NETWORK).

Picture 4: Exhibition in Genova for the Italian Task Force focused on Education for the Marrakech Process

Picture 3: A pilot experience in the Katho- Reno Teacher training college in Belgium. The Step-by-Step cards are behind showing the students the 5 steps they will follow.

5. Social innovation for sustainability

LOLA project intends to contribute through education and awareness to a change in the currently dominant models of living, production and consumption, in particular giving visibility to new possibilities, through the examples of groups living their everyday life in a more sustainable way:

> *So, contrary to the most common clichés, in social and political terms seeking sustainability is the opposite of conservation or, to be more precise, the conservation and regeneration of environmental and social capital means breaking with the currently dominant models of living, production and consumption, and experimenting new ones*.[9]

This quote refers to the concept of creative communities: "grass-roots organisations of citizens and other actors who have, or could have, the ability and will to re-orient themselves towards sustainable ways of living and producing".[10]

In the LOLA process, students are invited to look for new models around them, promoting a social conversation about possible sustainable futures, or better saying, about the hidden "seeds" of this future.

Considering that, as we will see in the next lines, LOLA is taking part in the movement now discovering "social innovation" as a relevant phenomena to be taken into account if we want to find "new ideas that work to meet pressing unmet needs"[11], here particularly considering the "need" for more sustainable ways of living.

The key point of social innovation theories is how to move social innovations from the margins to the mainstream, considering that social innovations are sometimes understood as a result from the work of heroic individuals, or as a result from much broader movements of change such as feminism and environmentalism. They analyse how social innovations progress through a series of common stages: from the generation of ideas through prototyping and piloting, to scaling up and learning.[12]

"Learning" is keyword in social innovation processes:

> *"The transition towards a sustainable society is a massive social learning process. The radical nature of the objective (learning to live better leaving a light ecological footprint) requires vast experimentation, a vast capacity for listening and just as great a degree of flexibility in order to change when it becomes evident that a road embarked on does not in fact lead in the desired direction"[13].*

> *(…) all processes of innovation can be understood as types of learning, rather than as 'eureka' moments of scarce geniuses. Instead, ideas start off as possibilities that are only incompletely understood by their inventors. They evolve by becoming more explicit and more formalised, as best practice is worked out, and as organisations develop experience about how to make them work. This phase involves consolidation around a few core principles which can be easily communicated. Then as the idea is implemented in new contexts it evolves further, and in new combinations, with the learning once again more tacit, held within organisations, until another set of simplex syntheses emerge*[14]

Types of learning that take place inside organizations, as well as a broader communicational process, are able to promote the transfer of these innovations from one context to another. The replication of social innovation is a key issue that is also being considered by businesses[15] as well as designers[16], these last ones specifically interested in how to replicate innovative solutions maintaining their original qualities[17].

[9] Manzini, 2005
[10] Manzini, 2005.
[11] Mullgan et alli, 2006.
[12] Mullgan et alli, 2006.
[13] Manzini, 2005
[14] Mullgan et alli, 2006.
[15] Stanford Graduate School of Business, Center of Social Innovation [http://www.gsb.stanford.edu/csi/]
[16] Manzini, 2005.
[17] Jegou, 2006; Cipolla, 2007.

These theories of social innovation for sustainability are particularly related to communicational activities, targeted to give visibility to these spontaneous initiatives that are "seeds" or "signs" of a potential future. This activity is considered as a way to promote a change in the current unsustainable lifestyle trends.

Picture 5: This scheme shows how LOLA uses the Social innovation theories to generate a shift towards a more sustainable mainstream behaiviour

One possibility– as done by EMUDE for example – is use scenario building as a strategy to stimulate social conversation; i.e., design a series of visualisations about how a sustainable future could be lived. These visualisations, based on examples of solutions developed by "creative communities", propose a mosaic of solutions of a "sustainable everyday"[18]

The LOLA project – as a didactic project – acts in a similar way. It does not propose to build scenarios, but stimulates students, teachers and eventually their parents to participate in a "virtuous circle"[19]: initially as "antennas"- detecting promising cases of social innovation for sustainability but also reinforcing these signals through the discussion with their neighbours, schoolmates and parents and interviewing people who are living differently in the reality around them. These conversations insert participants in a broader leaning process, able not only to "transfer" social innovations for sustainability from a extended context to a more near and personal one, but stimulating changes in students (and teachers!), personal attitudes and views about the way they can live everyday life. It's also necessary to add that extra material as the ***LOLA Exhibition***, ***Web Platform*** and SEP's "catalogue of cases" share the role of communicating best practices outside the project's domain, i.e., make them accessible to a broader audience.

[18] Manzini, Jegou, 2003
[19] EMUDE European Community FP-6 SSA, 2005-2006

6. Collecting cases: qualitative criteria

As we have learned, LOLA project is based on a process of collecting case studies. Which kind of cases studies does LOLA encourage students to look for?

This question indicates the qualitative criteria that form the basis of LOLA didactics and can be described as follows:

1. innovative solutions;
2. bottom-up organizations;
3. socially positive;
4. 4. environmentally friendly.

These criteria were also used in the EMUDE research project, during the phase on which students were invited to observe and collect cases in their own countries. Therefore, these indicate the common ground of SEP's catalogue of cases, the same catalogue that invites to integrate the cases collected by LOLA project, exemplifying promising solutions in terms of sustainability.

2.2.1 innovative solutions

Students are invited to collect cases presenting organizations of different social actors (local-social actors, see next point), which organize themselves to get a result or to open a new opportunity in organizing daily life. The solutions have to be innovative in relation to main stream thinking and action - for what regards places observed per se are not solutions in the sense we are using here, for example: an interesting ecological building, a place with beautiful monuments or a medical therapy.

2.2.2 bottom-up organizations

The promoters of the solutions have to be "local": the same with final users, local entrepreneurs, local NGOs, local institutions. However, the notion of what can be considered as "local" is relative: a regional initiative is local in relation to the national scale, a city initiative in relation to the regions, the neighbourhoods in relation to the city, and so on. In our case, we will consider an initiative as "local" when the promoters operate at the scale of the neighbourhoods and/or of a little city, although they may be linked with larger organizations.

2.2.3 socially positive

The solutions, getting a result or opening a new opportunity (see section 2.2.1), regenerate the social capital and strength the social fabric. They have a socially regenerative effect that takes place directly (it is a formal goal of the initiative) or indirectly (it is not a formal goal of the imitative but, nevertheless, it happens).

However the social aim should not be the main and only one: a case is promising because it is possible to imagine as "a model for new ways of being and doing". Charity and/or social improvement programs are very good initiatives, but they don't insert themselves in everyday life as models of new ways of living for the whole of society. In some cases, few charity initiatives organized bottom-up by the same in need can propose objectives and organizational models that could be valuable also for other people, becoming a more general model of doing.

2.2.4 environmentally friendly

The initiatives - that get a result or open a new opportunity (see section 2.2.1) - reduce previous average environmental foot-print. They should have an environmentally regenerative effect that takes place directly (a formal goal of the initiative) or indirectly (not a formal goal of the initative, but, nevertheless, it happens).

However, the environmental aim doesn't have to be the main and only one. They do not need to be initiatives directed only towards solving some environmental problems as recycling wastes, renewable energy generation, pollution prevention, etc. They should be activities attempting to achieve a positive result or to open a new opportunity and, while doing that, solving some environmental problems (as recycling wastes, using renewable energies, etc.).

To resume, the cases targeted should have an embedded balance between these four elements, accepting that one or more of them can be predominant due to the aims established that motivate the participants to join and persevere in their practice.

7. A "designerly way of knowing"

The LOLA project was presented and analysed here in terms of issues of social innovation for sustainability, pedagogical theories and ICT. LOLA's core activity is based on the process of collecting cases of social innovation. The key pedagogical activity is the definition of the qualitative criteria used to discuss the value of these cases in light of sustainability. Four criteria were examined: *innovative solutions, bottom-up organizations, socially positive* and *environmentally friendly*. These criteria are "initial filters", or "guidelines", because teachers are themselves involved in the learning process with their students during the collection. Here LOLA adopts a phenomenological approach: the value of each case needs to be particularly examined and discussed, and teachers are considered "facilitators" of this process. Students are invited to "discover" the "hidden seeds" of a sustainable future in their surroundings, not only "observing" cases but also arriving to have interpersonal interactions with its promoters. This entire process is targeted to promote changes as to how students interpret "reality", promoting the emergence of new meanings that, hopefully, will be more sustainable.

The importance of adopting ICT in LOLA goes beyond operational issues strictly related to the development of the project itself. Specifically, bearing in mind the fundamental themes of sustainability (environmental and social), connectivity and globalisation, we will have to learn to live better consuming less and regenerating our physical and social environment in an ever more closely and extensively interconnected world. Therefore, efforts to use ICT in LOLA project – now and in the future – can be considered also targeted to create communities of "sustainable" practices that could hopefully evolve in innovative and promising forms of collaboration.

Last but not least, the LOLA project develops also a "designerly way of knowing"[20]. Students are stimulated to understand "how the project start", "who are the users", "which user need does it answer", "what are the aims", "what works well in the solution", and other questions that implicitly induce students to recognize initiatives in a "solution-focused way", or as a result of the arts of planning, inventing, making and doing. So LOLA is more than an "observation" of what is happening around, or a *learning-with-good-examples* practice. It intends to promote in students – so far as possible – the idea that people are able to "design" for themselves, to solve problems and to live in a sustainable way. So the question that each student is being invited to do is: can't I do the same?

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design Activism as a Tool for Creating New Urban Narratives

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Abstract

This paper reports on the activities of an alliance of artists, designers, architects and community activists in the development of a campaign to open up the imagination of how a large, complex city might act on its present and view its future. This is broadly dedicated to the development and diffusion of a counter-narrative of urban identity that provides new models for the everyday life of the city. It highlights the ordinary processes in the maintenance of collective endeavour. It also reviews the ways by which shared visions are fostered and the political challenges this poses. By focusing on processual measures across a community, the possibilities of design activism, both as practical action but also as political agency, are discussed.

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Introduction

This paper is concerned with design activism both as social action and political agency. It reports on a number of initiatives undertaken within a defined locality that bring together otherwise quite fragmented activities. These activities involve groups or individuals engaged in various forms of creative practice for social and environmental benefit. They are largely working in the third sector, that is in the voluntary or non-government sector, often funded by national, regional or local government grants or charitable support. In bringing them together, a sense of shared identity and purpose is defined as well as the opportunity for mutual support. At the same time, this networking takes place in a larger discursive field regarding the promotion of certain values as to what an urban agglomeration might be – in stark contrast to what it is. This new 'discursive field' itself is more self-consciously created by an alliance of interests.

Design activism itself broadly encompasses a wide range of real-life processes from greening neighbourhoods to transforming communities through participatory design action. Anne Thorpe takes activism to involve intentional action to bring about change, adding that her concern is with the actions that are visibly public in nature, rather than the 'day-to-day, behind the scenes administration of groups' (Thorpe 2008). The ground presented in this paper is indeed highly public. It concerns a city-wide debate on its future in terms of governance, planning and identity. While many of the activities that are reported on exist very much within the 'day-to-day', they therefore also connect to large questions. Necessarily, there is a degree of discussion of 'behind the scenes' activities that reveal some of the dilemmas and solutions in mobilizing design activism.

The Codification of Place

The context for this paper exists at two interrelated levels. One is in the wider practices of urban design and place-marketing in the UK over the last 10 years. The second exists more precisely in the particular conditions of economics, planning and governance of the city of Leeds that has produced an urban problematic. Leeds is a city of some 700,000 inhabitants in the north of England – 150,000 of them are in the bottom 10% of income levels. Some 140,000 of this population live in its inner suburbs (Unsworth and Nathan: 2006). This latter problematic to be found in Leeds is most probably transferable to other UK cities, although its generalizability to other countries may be debateable.

The post-industrialisation of modern cities and their slippage into knowledge economies has produced a seemingly unending requirement to compete with each other. Within this perceived imperative, new systems of governance are created, strategies are formulated and slogans are written.

For example, in 1990, the Leeds Initiative was founded. This strategic partnership brings together the public, private, community, voluntary and faith sectors to create policy and its implementation with regards to economic and social development. At one level this is typical of the 'agentification' has emerged in neo-liberal governance (Whitfield 2001). Through the Leeds Initiative and other local government strategic bodies, large amounts of policy have been turned over to so-called ALMOs (Arms' Length Management Organisations). Social and economic policy, previously formulated and carried through by the state, is formulated and played out by a partnership between national, regional or local government and a wide and sometimes fragmented range of NG0s and other interests.

At another level, such systems of governance are driven by target-setting and attainment that is promoted through rhetorical boosterism. For example, the first of the Leeds Initiative's aims is, 'Going up a League', 'making Leeds an internationally competitive city, the best place in the country to live, work and learn, with a high quality of life for everyone' (Leeds Initiative 2004).

This policy of boosterism has also given way to the emergent discipline of place-branding. In their efforts to distinguish themselves, many authorities of urban agglomerations have developed marketing strategies that identify and roll-out their unique selling propositions, encapsulated in a slogan and graphic applications. Thus, 'vibrant', 'cultural', 'diverse', 'cosmopolitan' and 'sophisticated' are frequently used descriptors that seem to almost come straight out of the Richard Florida (2002) textbook on how to lever a Floridean version of the creative city into a marketing campaign (see Julier 2005). In 2005, MarketingLeeds, a body set up to promote the city, launched its own city brand at a celebrity filled launch in the city's famous shopping quarter. Conceived by a local branding and communications group entitled An Agency Called England, it featured the slogan, 'Leeds. Live It. Love It.'. In developing this identity, the agency undertook a survey of Leeds residents to discern if the city was a person, what kind of person would that be. The research that came back was that Leeds would be, '..a young male, friendly, your best friend, a reall nice person to know, an ambitious person, living in a trendy apartment, driving a Volkswagen Golf GTi' (Scott 2005). This would be used to articulate the new Leeds brand.

Such initiatives imply a codification of urban experience. How a city is, how it is lived, what aspirations one might have within it are set out, almost literally, by the brand strategy handbook.

Another level of codification has also emerged within the practice of urban design and planning over the past 10 years. The UK government's Urban Task Force, founded soon after New Labour's election to power in 1997, published its highly influential policy statement *Towards An Urban Renaissance* (Urban Task Force 1999). This and the subsequent Urban White Paper (2000) came amongst a plethora of government policy that attempted to address urban living in the postindustrial era. For the first time, design was placed as a key component in the revitalisation of urban areas.

Its trickle-down effect to regional and local governments has led to the production of numerous design guides, compendia and statements. The Urban Task Force document made linkages between design, the sustainability of communities, demographic change and economic activities (UTF 1998: 27-34). None the less, its translation into government policy and thence into application at local level has tended to focus largely on a narrow interpretation of design as engaging its purely formal rather than processual features. Implicit in this is a behaviouristic model of urban design that is deeply embedded in its theoretical backgrounds (see Cuthbert 2006). In brief, this approach is firmly rooted in a purview of space as the assemblage of typologies that are based entirely on their material, contextual delineation rather than on practices of everyday life. Thus, for example, we hear of 'settlement pattern', 'urban form', 'urban space' and 'built form' (eg. DCLG 2006: 65) rather than the human infrastructure of, say, 'kinship', 'mobility', 'social networks' or 'labour'. Whether it be the guides on 'best practice' in developing design codes or the design codes themselves, the emphasis is on design that *produces* attitudes and behaviours in and toward places. Put the other way around, despite the recurrent reminders that public consultation is generally a good thing in the development of design guidelines, the end result is a particular, specifically cast narrative of what urban living should be. This narrative is, in turn, served up as something to be consumed, adhered to and adopted as a disposition or, as Bourdieu (1984) would have had it, an urban *habitus*.

As with any marketing strategy or masterplan, this is all well and fine when there is consensual buy-in on the part of the internal audience of an urban agglomeration – citizens, in other ways. This is most likely to happen in the context of economic success, social cohesion and environmental stability. However, even in the most ideal of circumstances, this doesn't' go uncontested. The Urban Task Force vigorously championed Barcelona as a city that had achieved this. Resistances and debates concerning its 2004 Forum swiftly showed how easily this perception can be destabilised (see Degen 2003).

Trouble in Leeds

Where the traditional economic, social and environmental order is in crisis, or is, at least, challenged, so the dominant narrative of what that place is may also come be contested. This seems to be the case in Leeds.

Over the past 20 years, Leeds and its city-centre in particular has undergone significant change. Key features include:

- re-imagining of the city as 24 Hour City with 'European' allusions to being the 'Barcelona of the North', 24 hour café society and city centre living from the early 1990s (Haughton and Williams 1996);
- employment in manufacturing dropped from 33 per cent to 17 per cent 1977-1993 (Leeds City Council 1998);
- growth of its city centre population from a few hundred to a projected 20,000 by 2015 (Knight Frank 2005) (NB. this will only account for 2% for the city's population (Fox and Unsworth 2003));
- £1.4b. worth of office and apartment schemes under construction at the end of 2006 and a further £5.8b. proposed – a total of £10.4b since 1997 (Leeds City Council cited in Chatterton and Hodkinson 2007);
- reduction of social housing stock by 40,000 over the past 25 years with a further reduction of 10,000 by 2016 (Leeds City Council cited in Hodkinson and Chatterton 2007).

Leeds has been marked by a rapid growth of service industries in the city centre, particularly in the financial sector and a related growth of private city-centre dwellings, almost entirely directed at younger upper-income owners with little ambition to long-term settlement there. Hand-in-hand with this development has been a vigorous dedication to the hard landscaping of the city centre, in line with many other city centres.

Without, 'a Masterplan for the city, nor tall buildings policy, nor energy strategy, nor integrated transport strategy nor public realm strategy', this has led to a situation where city planning has ignored, 'the notion of unlimited demand for deep plan air-conditioned commercial space and constantly refused to acknowledge that sustainable design may have a commercial value' (Bauman 2008). Equally, on a recent visit, Wayne Hemingway branded the city as, 'the most unsustainable' (Waite 2008).

In recent months, this strategy, or lack of strategy, has led to something of a planning crisis. As the city's river Aire burst its banks – the second major flooding of the city centre inside a year – so this gave visible evidence to the need to build a more sustainable approach to urban planning and design. In the background, the development boom has passed its zenith. The credit crunch of early 2008 and loss in demand, has led to many schemes being put on hold, including the £160m. Spiracle tower, a building for which the city's only city centre public swimming pool was closed to make way for.

This concentration on the city-centre as a capital intense, transaction rich and design and development dense hub contrasts with Leeds's inner suburbs. This city 'rim' is characterised by high levels of deprivation, a run-down housing stock and low levels of 'official' economic activity. Added to this is are topographical and planning issues which have caused these areas to be relatively cut-off from the city centre. Thus the benefits enjoyed by high investment in the city centre urban realm are not transferred to the rim, in terms of regeneration, by a 'ripple effect'. If there has been a strong narrative of 'going up a league', of Leeds as the international, 24-hour city to do business in, of retail-fuelled loving-it-while-you-live-it, then 2008 may be the year in which this version of the city gets re-coded.

Design Activism Re-Awakens

Set against this context of city-centre growth ‘at all costs’, 2007-8 has seen the emergence, or I should say, re-emergence, of design activism as a practice where a constructive counter-narrative is taking place.

Leeds has a strong history of counter-political action connected to creative practice. For example, it is home to the Leeds Animation Workshop. This was founded in 1976 as a group of women who came together to make a film about the need for pre-school childcare. Since then they have produced numerous titles on social issues. Leeds is the home of Leeds Postcards. Founded in 1979, this group set the standard for activist stationery in the 1980s. Leeds is also where, via a slow process of community participation, steps were made in the 1990s to the establishment of Britain’s first Home Zone, turning residential streets into mixed use civic spaces (see Julier 2007: 204-8). This history certainly acts as inspiration. But many of the people who have been actors in this history have brought their experience to bear in the current situation. This isn’t student protest. It is action carried by many people with considerable experience of carrying forward complex projects and in different contexts of urban governance. In addition to this, recent years has seen the rise of a number of ‘design activist’ social enterprises. Examples of these include:

- Hyde Park Source, who create gardens and play areas out of derelict areas;
- Ketchup Clothes who create new fashionware by recycling existing garments;
- East Leeds FM, a radio station that incorporates community discussion fora on sustainability and the neighbourhood design issues.

From 2005, there has been a considerable re-birth of activism in Leeds that is centred on sustainability, urban form and governance. Thus environmental, design and political (with a lower-case ‘p’) questions are linked (summarised in Fig.1).

This impulse toward activism is held within particular special interest groups within civil society, university academic departments and some professional creative practices. While several fora and groups constitute a broad alliance of activists, movement between them is fluid in terms of ideas, action and people. Such porosity maintains an open sense of participation and inclusion while each group is coordinated or driven by key activists. Also noteable is the close relationship between public lecture events, workshops and symposia, and their leading to the foundation of action groups. Indeed, the call for papers for the Changing the Change itself acted as a catalyst toward the concretization of further design activist initiatives.

Within this micro-history, a key moment were protests regarding the city’s Corn Exchange. At the end of 2007, the Leeds City Council allowed its leaseholders, Zurich, to evict all of the building’s independent stallholders in order to usher in greater turnover and higher rent-paying businesses that belonged to multiples. As this building was a favourite haunt of teenagers on Saturday afternoons, this drew a vociferous and concerted protest. This may seem like a banal affair. However, it was an important watershed in citizen participation in protest as to the governance of Leeds. The notion that there would be consensual buy-in to a vision of city development as embodied in relentless retail development and gentrification is presumptuous.

This event led to a discussion event in early 2008, attended by 250 citizens, as to the direction of the Leeds city centre – its management, governance, form and planning. It was entitled ‘Leeds: Are We Going In The Right Direction?’ and was hosted by the School of Geography at Leeds University. While overtly critical of local authority approaches, it also fostered a sense of positive contribution to planning processes and a willingness to engage local government. Many of the broader wishes of these citizens coincided with stated local authority policy – the development of more green space, better public transport, more affordable housing, better cultural resource. But the development of such fora shows a will on the part of many citizens to see such developments realised. It plays an alternative form of political pressure to the four yearly and underused ballot box.

LoveIt.ShareIt.

The new landscape of peak oil, climate change and of the crisis of many financialisation and property initiatives, and with it of the naïve belief in continuous growth model, requires new understandings and an ability to think laterally and holistically (Bauman 2008). The scale of participation in events such as 'Leeds: are we going in the right direction?', reported above, is evidence of a lack of confidence in the leadership of the city to deliver the requisite new thinking for these challenges. This condition has given rise to the emergence of a strong radical movement in the city under the slogan of 'LoveIt. ShareIt', a play on the Leeds brand, 'LiveIt.LoveIt.

This initiative is made up of individuals and groups, networking creative practitioners, academics and activists. Its steering group currently comprises Irena Bauman (Bauman Lyons Architects), Sue Ball (Media And Arts Partnerships), Rachael Unsworth and Paul Chatterton (School of Geography, Leeds University), Andy Edwards (independent graphic designer), Andy Goldring (Permaculture Association) and myself. As such it comprises an alliance of creative practitioners and members of the academic community.

So far it has identified two aims for the coming months. The first is to undertake a mapping of the inner suburbs of Leeds, paying attention to three aspects:

- social institutions – eg. sporting or leisure clubs, faith groups, support groups;
- green space use – eg. gardens, allotments, left-over spaces, derelict space;
- grey economy – eg. informal childcare networks, vehicle repair activities.

By doing this it is hoped that attention is drawn to the resources that are available but invariably overlooked in these areas and that provide important infrastructures for the sustainability of these communities. It brings this, largely shadow, rim back into the wider picture of the city. It also begins to counter the notion that urban regeneration can take place from the centre outwards by helping to develop resilience of localities. It is intended that this action is both scaled up and down. It has started with a pilot project in the city's Richmond Hill area to test mapping processes and its forms of representation. This prototyping will then contribute to a toolbox which can then be rolled out into other areas of the inner suburbs. At the same time, it is expected that this toolbox can be used and adapted by communities themselves, thus scaling the process down and allowing for greater participation and less concentration in the hands of 'experts'.

The second mid-term aim of LoveIt.ShareIt is the development of an alternative vision for Leeds, counter to the already mentioned Leeds Initiative's official one. This will be guided by three aspirations for the city that are stated in the group's manifesto. These are:

- conviviality: supporting a diversity of forms of living;
- resilience: consolidating economic and social patterns that are tolerant of external change;
- beauty: nurturing a cityscape that exhibits a compelling material and human infrastructure.

The group is planning toward a document that will identify promising scenarios, existing and future tools as well as impact assessments that recognize the interlocking potential of design and/or communitarian activism and urban regeneration. Ultimately, it is envisioned that within 5 years, neither LoveItShareIt nor the 'Leeds. LiveIt. LoveIt' slogan need exist. It is hoped that the city may by then have adopted a new urban disposition.

Leading on from this, and also a number of other initiatives in the city, efforts are underway to create a wider, more inclusive and representative network of creative practitioners who are engaged in environmentally and socially committed activities. Around LiveItShareIt is also the Design Activism Group that has sprung from Leeds Metropolitan University's School of Architecture, Landscape and Design. The latter hosted the first national symposium 'Mapping

Design Activism' in 2007. This event instigated a discussion as to the history, topography and identity of design activism. In 2008 it also hosted a 'Gala Awards Evening' that mixed carnival (eg. cabaret acts, live bands) with an opportunity for various practitioners to meet and form closer contacts. Citywide design activism initiatives were mapped and future collaborations discussed. This was facilitated by a 'do-it-yourself' awards process, where participants made awards to each other in recognition of their respective achievements.

Discussion

The aims of LoveItShareIt and design activism in Leeds are unashamedly ambitious. They demand:

— the creation of new scenarios and visions for Leeds;
— a radical reappraisal of city-wide planning that embraces space use, social arrangements, local economies, mobility and connectivity;
— a reinvigoration of citizen participations in urban governance;
— new roles for creative practitioners within these aims.

These probably also seem rather utopian, touched by the enthusiasms that accompany the early imagineering of a project before the reality pinrciple of delivery sets in.

In terms of the initial mapping project, it is difficult at this stage to predict what the outcome of this initiative might be. At one level, it is about creating information systems through which localised social enterprise and everyday practices may be supported or support themselves. At another level it also carries a potential to broker new relationships between local government policy (and its partner organisations) and citizens. For example, within Leeds City Council, its Local Enterprise Generation Initiative (LEGI) is dedicated to developing entpreneurial activitiy in deprived areas. So far this has gone mostly toward supporting enterprise centres that provide advice and training for new businesses. The LoveItShareIt mapping may help as a catalyst to recognising the social connections required to stimulate local and sustainable enterprise. Implicit in this is an orientation away from a traditional, economically-led growth model of enterprise that is currently embedded in LEGI thinking.

In such ways LoveItShareIt may work to match up local government policy that is delivered through a fragmented range of agents and the disparate landscape of social enterprise and design activism (see Fig 2). At the same time, with its emphasis on socially and environmentally committed practices, LoveItShareIt demands a different story to be told in terms of city aspirations.

The classic and implicit dilemma here is the extent to which design activism practitioners are prepared to adjust to local government policy or, conversely, the extent to which local government is prepared to adopt new frameworks of practice. In terms of the latter, the demands for more sustainable forms of urban living combined with the challenges to current orthodoxies in city centre property development might orientate local government toward a new attitude. That said, a counter argument put forward by Buck (2007) is that ultimately, capital and neo-liberalism (which, ideologically is at the heart of city council policy) will always prevail through constantly propelling itself into new technological frameworks. Corporations, it is argued, will always find a way to install themselves at the head of whatever pile.

In the meantime, design activism in Leeds draws sustenance in two ways. One is in developing an internal sense of identity, a shared language and knowledge as to how to overcome everyday challenges. This is partly achieved through the use of events to bring such activists together. The other is by looking outwards to other sources of inspiration. Thus, for example, Demos's 'City Dreaming' project that sought to engage citizens in defining future visions for Glasgow is one touchpoint. Another is David Barrie's production of the Middlesborough's urban agriculture project.

Meanwhile, urban agglomerations consider their next step as to what experiencing urban

life is. The stories that have been offered in place-branding and in design-led regeneration have so far been limited. Design activism, such as that offered by this paper, may open up new texts and textures for urban existence.

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2005	2006	2007	2008
Green Drinks			
Leeds Sustainable Futures	**Schumacher North Lectures and Workshops:** Sue Roaf, Herbert Girardet, Ezio Manzini, Peter Harper		
	Stop Climate Chaos Leeds	**Lectures:** **Ben Brangwyn**	
	Leeds Eco-Village Project		
			Transition Town Leeds
		Corn Exchange Protests	
'Who Runs Leeds', School of Geography, Leeds University			**'Leeds: Are We Going In The Right Direction?'**
DesignLeeds, Leeds Metropolitan University		**Mapping Design Activism Symposium**	**Urban Mapping Workshop**
		Leeds Rim Study, **Bauman Lyons Architects** **Radical Leeds, (BLA/MAAP)**	**LoveItShareIt**
			Leeds Design Activism Gala Event
The Common Place			
2005	**2006**	**2007** changingthechange announced	**2008**

Fig. 1: Developing activist groups and resources in Leeds, 2005-8

Fig. 2: A 'map' of the 'fit' of some of the local authority agents, the Leeds City Council, LiveItShareIt and 'design activist' groupings.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Other Design at Sulukule:

A Local Development Project in a Degenerated Historical Area of Istanbul under the Threat of Demolition

Cigdem Kaya[1], Burcu Yancatarol[2], Asli Kiyak Ingin[3]

Abstract

The new policy of urban generation in historical Istanbul includes areas with significant cultural heritage. The perspective of this renovation policy lacks the social dimension of sustainability and tends to replace the mature and colorful fragmentary texture with shiny shopping centers and chain hotels while ignoring the unique cultural establishment of communities.

One of these areas are two neighborhoods (Neslisah and Hatice Sultan) known as Sulukule, an old Romani settlement famous for its music and entertainment culture. This study is going to reveal the process of intervening to the area by design for a healthy social transformation. The results of this project shows the potential of valorizing local production and draws a framework for using design as a tool for socio-economic resistance in Istanbul neighborhoods.

The aims of this project are to help the habitants stay in their native land, to institutionalize their material culture (which is being rejected by the local government), to help them gain self-confidence via learning the production culture, and finally to equip them with social and economic toolkits of community empowerment.

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Design's Capacities

It can be suggested that the tools taught in industrial design education can be used efficiently to assist the local community with fostering and sustaining local production. If an industrial designer can see his/her practice as the process of creating an entity as opposed to the finalized mass produced item, s/he can appreciate the outcome of a process that is not necessarily produced in a factory. This ability of appreciation will stretch how this production can be placed in the world: introduced, communicated and sold. This could also be regarded as a stance of the designer between the world of factory production and one of a kind sculpting. The industrial designer's toolbox, equipped with skills geared towards mass production, can be reshaped by the contexts where design vision needs to take different forms, and may even be formless.

In his lecture 'Culture as Our Chance, of Finally, Being Human' at Parsons the New School for Design, Dilnot (2007) noted several capacities regarding *'the role of design in relation to cultural work.'* by *'….identifying, even if very loosely, the capacities that design entails which might allow design to engage, even if symbolically, in making a humane world.'* Dilnot (2007) aims to illuminate the ways that design can be a part of everyday life in a more humane, responsible and responsive manner. Grouping these capacities in five areas also indicate the roles that design; thus the designer can take on in their practices apart from focusing on the end-product:

1. Design capacities as capacities to do with organizing and planning (organization, planning, programming, scenarios, schematics)
2. Those to do with mediating and attuning our relationships (negotiation, mediation, attunement, resonance, reciprocity)
3. Capacities of moving from existing to preferred situations /capacities of intervention (translation, intervention, transfiguration, (re-)configuration, disposition)
4. Natalic capacities, those involved in bringing something new into the world (possibilities, propositions, origination, invention, innovation)
5. Transfigurative and poetic capacities (transformation, revelation, transfiguration, poetic gauging of existence, aesthetic discovery)

These capacities are also processes. Every process requires a certain investment of technical, social and communicative skills that can be adapted to new contexts. Therefore, a designer's skills in her toolkits are re-configurable and adaptable to utilize design's capacities as processes that are not always linear but emergent, organic and semi-organized (Dilnot, 2007).

In the following sections, first, the necessity of social transformation and its dynamics will be explained. Then, the case of the Romani neighbourhood of Sulukule in Istanbul will be introduced as an example of gentrification as opposed to a zone of healthy rehabilitation as a result of the global dynamics that are active in the city. The outcome after two years of field work at Sulukule can suggest a guideline for designers who would like to place themselves as agents of valorising the potency of a community in means of cultural production.

The Grand Narrative of the Spectacle

Representing a city in a global network means not only branding it but also re-evaluating its assets: '….*Hard assets include natural beauty and features; shopping facilities; cultural attractions; and buildings, museums, monuments and the like. Soft assets are all about people and culture: skills, traditions, festivals, events and occasions, situations,*

settings, social ties, civic loyalty, memories, and the capacity to facilitate learning of various kinds.' (Thackara 2005, 79) These assets need to be abstracted from their local meanings to a form of exchange and/or symbolic value so that they can be utilized for the city's desired level of integration with the global economy. This process of re-evaluation requires the identification of the city's 'functioning' and 'non-functioning' parts to better operate the grand mechanism of turning the city into a 'spectacle'. In Debord's words, '*for what the spectacle expresses is the total practice of one of the particular economic and social formation; it is, so to speak, that formation's agenda.*' (Debord 1967, 15)

Architect Teddy Cruz (2004) states that after 9/11, the Pentagon '*re-conceptualized the perennial division of the world into northern and southern hemispheres, first and third worlds.*' (Cruz 2004) As Pentagon strategist Thomas Barnett (2004) points out, this new categorization of the world re-identified the parts of the new polarization directed by globalization as the **functioning core** and the **non-integrating gap** according to their development levels. The functioning core is characterized with '*those parts of the world that are actively integrating their national economies into a global economy' s*uch as North America, Europe, China, Australia and New Zealand, South Africa, Argentina, Brazil, and Chile (Barnett 2004). On the other hand, '*regions of the world that are largely disconnected from the global economy and the rule sets that define its stability*' such as Caribbean Rim, Africa, the Balkans, the Caucasus, Central Asia and the Middle East are classified as the non-integrating gap (Barnett 2004). The imaginary borders drawn between these functioning and non-functioning parts constitute the '*thresholds of the current global socio-political geography*' (Cruz 2004) and are re-formed constantly. The tensions emerging across these imaginary borders between the poles of development show how ' the functioning core' insistently approaches 'the non-integrating gaps' as the execution sites of its global economic and political agenda that aims to control the global flow of capital through revised strategies of colonization, assimilation and marginalization.

It is crucial to recognize that the global dynamics and their social, economic and political workings are active not only between nations or continents but also in smaller contexts since the fundamental act is to create centres of power by dividing while uniting. That's why; it is possible to scale the concepts of 'the functioning core' and 'the non-integrating gaps' down to an urban context to better understand the relationships and their consequences. By decreasing the size of the field, the flows of global dynamics become traceable with their tangible side effects.

To be a significant node in the global economy (metropolis) the city has to go through strategic transformations that are led by political, economic and cultural actors in the scene. The grand agenda of turning the city into a spectacle and commoditization of everyday modes of production involves the spread of spectaclist aesthetics through urban transformation in a manipulative way. With this agenda, the functioning cores and non-integrating gaps of the city are identified and the polarizations are emphasized in order to better strategize urban transformation as an aesthetic project and to generate projects for the spread of the 'preferred' aesthetic from the metropolitan centers to non-functioning peripheries. It can be said that the hegemony of glorification disguised as development spreads with regard to the application methods of the grand spectaclist narrative.

The grand mechanism works in two ways: 1.The local, the non-integrating gap is commodified and exotisized with its social-economic struggles so that it appears to be an asset (a touristic one just like the Brazilian favelas) that can be promoted with an emphasis on cultural diversity. 2. The periphery which projects shadows on the city's bright face is 'cleansed' from its current struggle by filtering the useful assets (such as valuable land, historical monuments etc.) and revitalizing the area: gentrifying simultaneously.

According to Cruz (2004) the grand mechanism's focus '*on the extreme areas of development in many cities around the world shows the urgency for many metropolitan*

centers to engage in the relevancy of new economic models of revitalization through privatization'. (Cruz 2004) However, non-integrating gaps are constantly subject to the functioning core's pressures to either transform them according to the aesthetic agenda or to marginalize them to the degree that socio-economic degradation splits the communities apart.

When the production of the spectacle via globalization is scaled down to the city, partial consequences of colonization in the non-integrating localities (the land, the residents and the material culture) can be observed. The colonialist approach of the city's globally functioning parts defines these localities as disempowered non-globals by '*progressive spatial segregation, separation and exclusion*.' (Bauman 1998, 3) This is the reason it is worrisome that the communicational breakdown between the globalizing communities and the traumatized localities help sharpen the gaps (Bauman 1998,3).

In 'The Society of Spectacle', Debord (1967) states that the city as a spectacle *'brings in negation and consumption in the cultural sphere.'(*Debord 1967, 129) In the cultural spheres of the city, the great agenda of aesthetization applied on the material culture of localities through consumption negates the nature of the local everyday production. The organic and cohesive production in the locality is interrupted and '*dissipation of communal networks and forceful individualization of destiny*' traumatize the communities (Bauman 1998, 100). On the other hand, aesthetization of everyday production as a local initiative with the residents-defined not as 'the receivers' but 'the participants'- has the potential to get around the grand strategy and counter-direct the global dynamics in the city. This is why aesthetization of everyday through consumption and commodification of cultural production in the localities can be a tool for people with design training to assist the non-integrating gap to be visible. This involves re-designing the residents into the local production and solidifying the *'the territorial capital into a policy or a design program.'* (Thackara 2005, 79)

The focus of this study is to understand how tactical aesthetization of everyday life through design by re-evaluating the modes of local production in degenerated neighborhoods and turning their exploited relationships with the functioning core to a negotiation of authorship, resources, labor and money can empower the non-integrating gap.

The Commoditization of the Local in Cultural Production

The consequences of globalization with its ties embedded in modernity have defined new polarities discussed above. In a designer's point of view, 'global' connotates unification, being all identical, spheres: economical, political, cultural... 'local', however connotates difference, multiplicity, micro practices, minority and accent. Physically explaining, the global is indifferent to location. It is not site-specific.

What then are the properties of the vanishing local? Locality recalls the word 'vernacular' for an industrial designer. For a sociologist it can be an issue of minority, for an economist a field of poverty. From a broader perspective it may even correspond what opposed the nowadays understanding of 'innovation' and 'development'. For Hardt and Negri (2000), local is the key generator of multiplicities. In their book *Empire* and *Multitude,* Hardt *and* Negri (2000), optimistically point out that globalization have formed unusual practices and perspectives: unregistered economies, black markets, fake brand production and localized sit-coms (Hardt &Negri, 2004).

Overlooked by the centre of globalization, these practices are identified to have started in underdeveloped countries. However, their existence indicates a symptom of a disease: the automatic reaction of the immunity system of the society. It is not designed. It is not planned. It emerged as a back door solution. What can our society learn from the genuine solutions of the poorer? It can be discussed that these motives are good for sustainment, since these movements are emergent bodies as opposed to being top to down.

Also, the variety and the density of unregistered trade of information, items, technology and culture are related to the density of the globalization. The more severe globalization spreads, the more severe the reactions will respond. Locality mirrors the global back unto itself as a replica which validates the aesthetics of the cheap through accessibility.

The local, resembling the content of the vernacular, has been made 'contemporary' by the dominant actors of the market. The global economy adopts local forms to create local accents for global production, still having the say to choose or leave when necessary.There is two applications of this: 1) The famous Ottoman motif 'cintemani' appeared in several haute couture collections in the 90's. This elegant, niche and expensive quotation was regarded as an exquisite interpretation of Turkish culture. It was an outside-global- signal that broke the internal- local- stigma. 2) In the 2000's these local motives are used in all sorts of unregistered design and production in its cheapest way. They are appropriated as a design stance by some designers and some designers keep referring them as the exotic other. From this argument, it can be said that the belief that there is a novel methodology to borrow local designs is not true. They are collective property: heritage, in a sense.

Sticking to local values and negotiating in between ways as opposed to high modernism created hybrid modernities, hybrid forms and hybrid practices. However, in the current value system of aesthetics, these hybrids are overlooked and underestimated. While, powerful designers love to use locality's exotic face, the local is rapidly being dislocated from everyday life and washed away by leaving its objects as history in museums.

Gentrification Becoming an Epidemic

One common method of dislocation in the city is gentrification. As discussed in the first section, the non-integrating gap has to be cleansed for its useful assets: the valuable land. (Yardimci 2005, 38-39). Gentrification, particularly in Istanbul, has direct effects on the dislocation of marginal cultures. The enactment of dislocating these communities means to rip off their cultural bonds with the localities and to erase their culture from the cultural memory of the city.

In his talk about his focus on Istanbul, Cabannes states that Istanbul right now experiences all the problems that all metropolitans will experience. The city as the economic and cultural capital of Turkey receives massive amount of migration and is a place where approximately 13 million people (city records, Istanbul Metroplolitan Municipality, 2008) from many different places and backgrounds live. Due to the tremendously high rate of migration and income difference, new neighborhoods are formed as the size of the city grows day by day. These bring many sensitive issues about how to use design knowledge to construct the local within the city in a healthy way: in a neighborhood scale. Quoting Cabannes: *'If Istanbul succeeds, we will all succeed.'* (Cabannes, 2008) Sustainable construction of localities with the help of design will show that localities are indeed the building stones of a socially just and culturally diverse city.

Looking closer at the city, the two 800 year-old Romani neighborhoods, by the ancient city walls of Istanbul, known as Sulukule (Neslisah and Hatice Sultan Neighborhoods) is the first field to observe the applications of cultural dislocation under the name 'rehabilitation'.

Figure 01. The Sulukule area

The field

The word ‘Sulukule’ can literally be translated as ‘Water Tower’ after the water distribution system during the Roman Empire. The abundance of the baths, fountains and Byzantian cisterns indicate that this water channel enters the city from Sulukule, diverge into three across the historical peninsula (Cecen 1934).

The Romani community has been living in Sulukule since they were located in this area about 800 years ago. Sulukule area, which was only a place for settlement in the beginning, has turned into a symbol of the Romani culture due to the integration of Romani traditions with the features of the land. In 1960’s the then Ministery of Tourism supported the establishment of the Tourism Society of Sulukule. The society organized a month-long Romani festival. This support indicates the intangible heritage.

Sulukule is next to the city walls of Istanbul in UNESCO’s world heritage list. The area is within the preservation zone of UNESCO. According to UNESCO criteria preservation does not only cover physical buildings but also the cultural capital around it: the intangible heritage (UNESCO 2008). In this regard, the city wall cannot be seen as a mere texture of stone and be restored accordingly. It should be considered as a whole with its relationship to its environment to show its real value.

Sulukule is one of the first Romani settlements and Romani music in Sulukule is an ecole in Romani music worldwide. Until the Turkish government’s prohibition of music houses in 1990’s, musical production was the main source of income in the neighborhood which was also one of the points of attraction in Istanbul guides. When the music houses were closed down, the field faced unemployment and lost its income from its entertainment production. More importantly, the communal ties empowered by collective production have been weakened by individual efforts to find alternative sources of income.

Therefore, reducing Sulukule area down to the land's monetary value and location would mean ignoring the Romani rituals, traditions, modes of everyday production and community interaction that are embedded in the streets of the neighborhood. Romani communities, which are famous for their natural talents in performance and music, have transformed the everyday in Sulukule into a performance with their daily exchange on the streets, at the festivals and events, in local squares, conversations on doorsteps and communal cookings. Collective production of music, dance and performance as a common part of everyday also identifies the major source of income for Sulukule residents.

The second and major loss is due to Code 5366[4] developed for two main aims (1) rehabilitate areas that is under threat of earthquake and (2) to rehabilitate physically worn out and degenerated areas which are defined as old and unsafe. Sulukule was selected to be rehabilitated according to this law.

According to the project of the Istanbul Metropolitan Municipality, 85%-90% of the residences are going to be torn down. The land will be made into an empty field and large suburban type residencies are to be built. The solution that is suggested, if not generated from the valid facts of the area, has the potential to sharpen the social and economic gaps between communities.

Taking into consideration that 80% percent of the residents were born in Sulukule, it can be said that living in single storey houses with a quad and having many pets is a pattern of their culture. The second problem is that none of the residents can afford to re-buy the new houses to be built. That is why their return to their homeland does not seem possible. Dislocating the non-integrating gap to remove the unwanted aesthetics for aesthethics of the spectacle can be a reason when the increasing value of the land in central Istanbul is considered (Oral, 2007; Turmen, 2006; Turker, 2007). Neighbourhood's being old, unsafe; and the residents' being associated with thievery as the justification behind the spread of the city's spectaclist aesthetics, create acute issues of social well-being. Even if this rehabilitation builds a safer neighborhood, it washes away material culture of a unique community. If rehabilitation does not protect local production, the diversity and differences in the culture of the globe will rapidly disappear. On the other hand, if local production is protected and supported, the globe can benefit from each community's way of living as a practical knowledge that passes on to the coming generations. It is once more important to indicate that these actions in a local scale are directly connected with the entire city and many other metropols of the globe.

The involvement of industrial designers to the project was in 2007, when a chain of actions were organized to create a foundation of a local development center. These forty day long urban action named '40 days 40 nights Sulukule' started forty days before the demolition. The aim was to make the local problems visible by gaining as much public attention as possible. This action created a think tank and a platform of creativity with the involvement of several experts (musicians, dancers, performers, histiroans, movie makers, artists, architects, industrial designers and sociologists to excavate the potency of the region. The actions were widely exposed to public by media (Ingin, 2007).

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[4] "The majority of the settlements in Istanbul are unsafe, unstable and under the threat of the earthquake. It has been observed and scientifically proved that several urban problems were identified because some regions are degenerated, some house illegal settlements which caused irregular urbanization.

The most appropriate solution to these problems in Istanbul is to apply sustainable urban transformation with improvement, adondoning, renovation, regeneration, project development etc. for cultural, physically safe, good quality and social and economical development in the areas under risk, degenerated areas and areas without proper infrastructure for common good.
(translated from Reason chapter of the Code 5366 accepted in the Turkish Parliament on May 16th, 2005)

The workshops focused on music, painting, fanzine production and weaving on the theme of daily life in the neighborhood. It has been observed that the creative potency of the region can be used as a lever for socio-economic rehabilitation of the field. Two outstanding exhibitions (Turkcell Hall and International Ulis Photography Festival, 2007) were held after the workshop of Istanbul-based photographer Tansel Atasagun with kids on the question of belonging: 'Why do I love it here?'

The creative practices on the field are tied to rigorous sociological analysis to know who these people really are. After actions and workshops, it has been discussed to explain it methodologically so that the experiences of this process can help other cities that are experiencing similar problems of poverty and gentrification.

In Making Cities Work for All: Global Action Plan for City Development Strategies by Cities Alliance the method suggested for making healthy decisions in a city has several consecutive steps from gathering existing knowledge to a monitored assistance program as opposed to a linear action of demolition and building something completely disconnected with the nature of the field. The design issue in Sulukule is not the architectural transformation of the land by demolishing the community's living spaces and building new villas, but a question of how to monitor a healthy cultural integration of the locality to the city's scene with its colourful life, cultural memory and local production. Instead of imposing design solutions from outside to a neighbourhood with unique communal assets, the territorial capital of the neighbourhood, especially soft assets such as '*skills, traditions, festivals, events and occasions, situations, settings, social ties, civic loyalty, memories, and the capacity to facilitate learning of various kinds*' (Thackara, 2005: 79) need to be identified. Soft assets are the organic bonds that tie the community to their living spaces. Therefore, sustaining everyday production can happen only if these organic bonds are turned into a design program that facilitates local production by utilizing the inherent skills, social ties and traditions.

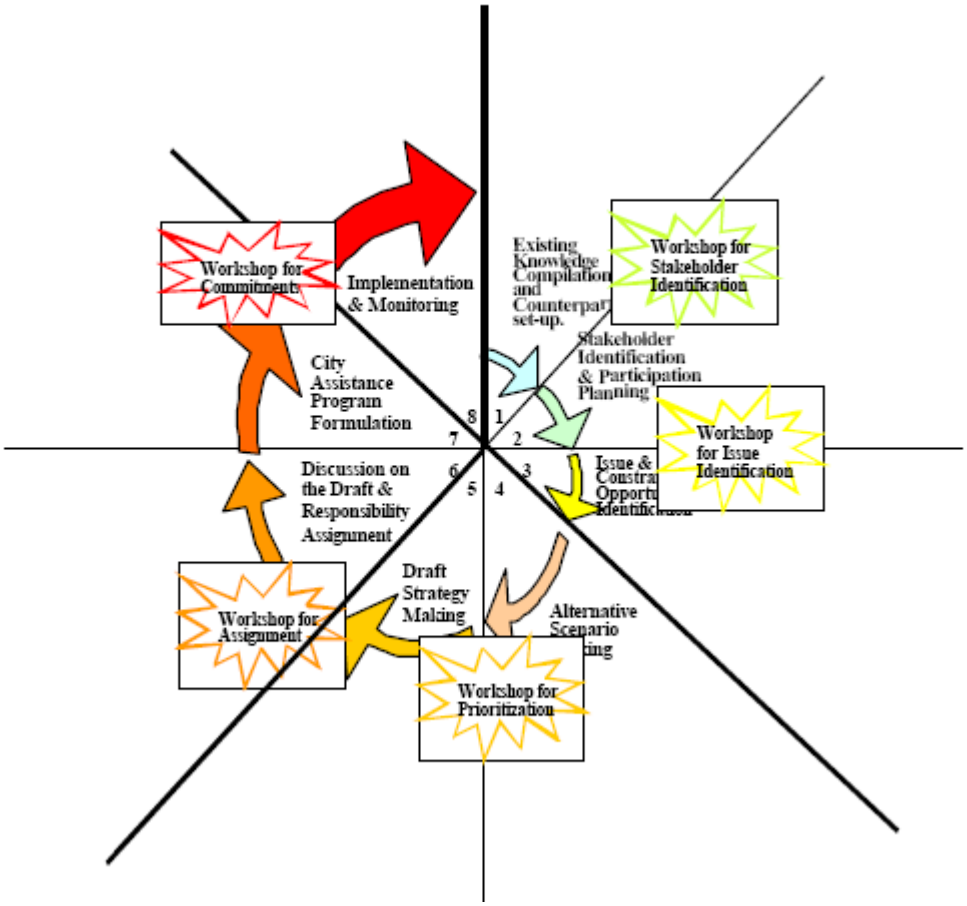

Figure 02. Schematic View: Process in Typical CDS, from 'Making Cities Work For All: Global Action Plan for City Development Strategies', Cities Alliance Draft, June 2002.

The potency of the region

In the case of Sulukule, design needs to identify the existing state (including the facts, the potentials) and to engage itself with the situation in an everyday context to be able to move towards a preferred state of social, economic and cultural well-being. Therefore; the major question to focus on is to define capacity of the area to be a territorial capital. For the last two years, the designers have been working in Neslisah and Hatice Sultan neighborhoods, interacting with the community and participating in their everyday production in order to identify the unrealized/unregistered or well-known capacities all of which carry unique features of Romani culture. The capacity of the region -the potency- can be studied in two groups. One is the intangible heritage in everyday rituals. The other is the tangible opportunities of production that can be created.

1. Music

The famous brass band from the region called Sulukule Romani Orchestra performs at some of the most prestigious venues in Istanbul such as Garage Istanbul, Hilton, Gemi and Tierra. The band released an album in 2007. The region has many musicians who can teach Romani music and dances who would like to study this.

Figure 03. Various Graffiti from the field

2. The wall

The ancient city wall of Istanbul is a landmark that borders the field. The meaning of the wall and its relationship with the city has been discussed before and during the demolition. Although, the neighboorhood has been identified with the wall, prior research could not really explain it.

The relationship of the wall to the neighborhood is more than saying that they are just next to each other. The authors, after a broad field work of two years, suggest the existence of an intangible connection. According to one of the folk stories, a Romani folk opened the "Pempton Gate" to Fatih Sultan Mehmet and let him in the city. It is said that the key to the field was thus given to the Romanis and they have lived there since then. Besides this, Hidrellez (A nocturnal celebration of the arrival of the spring where bonfires are started and young people jump on fire. Wishes are written on pieces of paper and are tied to rose bushes.) has been celebrated by that wall for a thousand years. The wall also has a memory. It can be said that the wall will carry these stories about the inhabitants' lives for thousands of years more. Thus, the city wall by the neighboorhood can sustain the culture of the community and serve as an invaluable landmark for the community if a better design system is created with the local government instead of the current one.

3. The name

The capacity of the region, the potency can be summarised in two groups. 1) The liquidized accumulation of everyday rituals. 2) The tangible opportunities of production that can be created. The liquid potency lies in the name :'Sulukule'.

It is vital to understand that geographical Sulukule and cultural Sulukule as a community is not the same. Even though the city's rehabilitation campaign focuses on the physical negativities in the area as a justification, it is important to understand that what constitute 'Sulukule' is not only two neighboorhoods but also the Romani oral history and the rituals that has been preserved by Romanis for centuries. That is why, after understanding the potential of the area the designers shifted their focus to non tangible cultural production. For instance, debates in the streets by women is a sort of unique performance in the area. Besides this, weddings in the area are spectacular celebrations in the street. As the bride leaves her house, the gifts sent by the groom's family are unpacked and placed along the path she walks. The streets of Sulukule have been a constant stage of performance. The everyday communication of the Romanis embody outstandingly rich gestures and expressions with spontaneous music and dances. Another example are the pleuthera of graffitis in the neighboorhood. These grafittis are brutal in the way that they don't contain artistic credit but they are very strong channels of self-expression on concepts of love, friendship, ownership and fantasy on a daily basis of communication. As a reaction to the present rehabilition project a grafitti saying 'welcome to hell.' was observed in the neighboorhood.

Having seen this natural richess of form, color and sound it can be suggested to designers who would like work in the area to find ways of pointing at, guiding and communicating what is already there. This is a proactive strategy to make the oral cultural heritage, particular to the ares, as visible as possible. Making the 'liquid assets' of the neighborhood become visible involves a tactical use of design to communicate the neighborhood's potential as a cultural heritage both to the public and to the community itself. In this case, design can take on a type of formlessness that can be directed by the dynamics of everyday. Creating not finalized products but platforms of interaction and communication can prepare the groundwork for tangible projects of local production. This can also utilize design's capacities of translation, attunement and negotiation in creating flexible bonds between the stakeholders.

The other side of the project can be valorizing the production potential in the area by assisting already existing production. Apart from the skills of musical production, other skills in the neighborhood should be brought forward and emphasized as the alternative supporters of local production. These modes of production can support already existing patterns such as sewing, beadwork, patchwork and similar crafts widely done by women. Design agendas for these 'alternative' ways of production should be created with the participation of designers, residents, local charities, local manufacturers, NGOs, researchers and academicians. In this case, existing everyday practices and small ways of income can be turned into a production program in an organized manner. For example, neighborhood women who produce food for sale individually can be supported and organized with the help of an agenda for production. In Sulukule, some women experiment with coloring traditional food which has a unique taste and look unknown to the rest of the city. These lines of production can be supported by micro credit on an individual basis or they can be turned into an open community platform by starting a craft house or cooking shop.

Conclusion

Sulukule at its current state illustrates all the tensions that generate from the imposition of spectaclist aesthetics of the 'functioning parts' of the city on the 'non-integrating, localized gaps.' However, Sulukule also renders a microcosm that can benefit from design interventions on an everyday basis and utilize the capacities of design to organize its territorial capital according to the following observation.

1. The region has a reputation with its music worldwide.
2. Many women are experienced in the textile industry.
3. It is within the UNESCO protection zone of tangible and intangible world heritage.
4. It is by the city wall of Istanbul which is protected by UNESCO world heritage.
5. A Romani music and dances research center can be established.
6. Residencies at the center can be offered.
7. Food design can be promoted.
8. Handcrafts can be introduced with the stories of the region.
9. Instead of tearing single storey houses down, some can be rehabilitated.
10. Collective spaces of collective rituals can be kept.
11. The new plan should keep quads for collective activities.

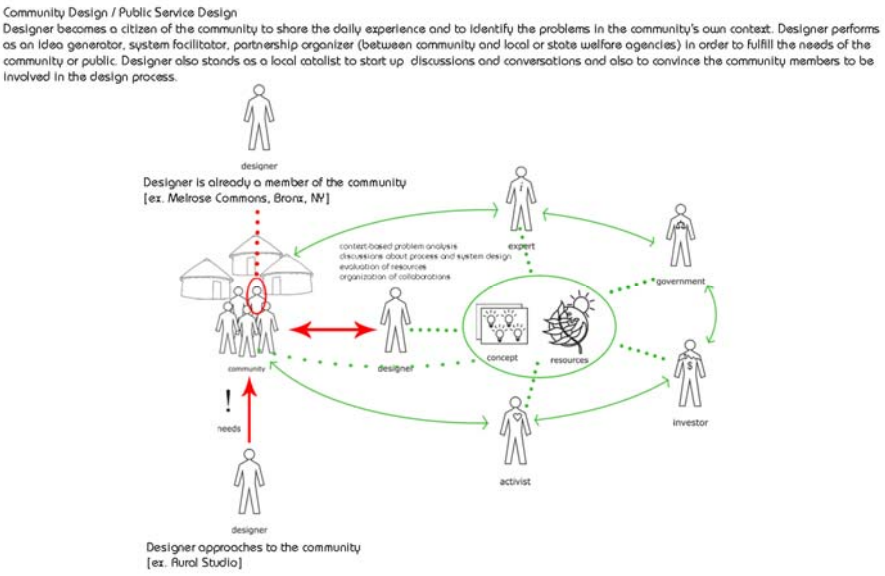

Figure 04. Public Service Design Model

The working methods of a designer for this aim involve collaboration with a web of artists, activists, sociologists and a facilitator for communication matters such as an NGO. After a two-year observation it can be said that these designers as creative agents in a community should have a strong background in psychology, sociology and strategic planning to grasp the situation first. The second quality is being able to develop projects as 'shots' that has been developed with prior experience foreshadowing the results. It should as well be stated that these projects, Sulukule as a case, require patience and ability to work under political stress. Unlike the examples from 'the functioning core', the projects in the 'non-integrating gap' are held with scarce resources, facing poverty. Thus, the designer should be experienced in feasibility and efficiency. It can be said that design education in the 'non-integrating gap' introduces these concepts to future designers as a reality of their context. This awareness, taking its roots from being 'non-integrated', can bring a new sensitivity about the profession of industrial design in the functioning core as well about how to pick what to design, the relationship between the designer and the designed.

Sulukule is not only a symbol of the Romani music and its lifestyle in Istanbul, but also is a case of resistance to the increasing urban rehabilitation processes. Genuine collective rituals such as the street and quad weddings, depiction of chest of hope of young girls and funerals are valuable resources to be introduced to the world from the perspective of a designer in a rapidly fragmenting and privatized world.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Proposals for A Good Life:

Senior Thesis Projects from Parsons Product Design 2003-08

Robert Kirkbride, Ph.D.[1]

Abstract

For the past five years, the Parsons Product Design Department has reconsidered a practice-oriented education through the question of what constitutes “A Good Life,” and for whom. As of July 2008, 169 seniors have developed personal thesis missions in collaboration with non-profit organizations in New York City and around the world, sharpening their professional and entrepreneurial skills with a critical awareness of the design process as a powerful agency for change. Across thesis year, each student identifies a specific problem, explores its local and global influences, and develops a comprehensive design strategy accountable for the impact of his or her product/system, from user scenarios through full life cycle analysis. The following paper and related “visualization” offer examples of the evolution in design research methodology through *A Good Life 1 - 5*.

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Introduction: Not *The* Good Life, but *A* Good Life

What is *A Good Life*? Where is it? Is it found in a world of bliss and plenty, or somewhere more fleeting and bittersweet? Is it guaranteed by agreement and uniformity, or through debate and difference? Is it produced in a melting pot, as a mosaic, or by some other not-yet-determined cultural, political or economic metaphor? Is it a destination or a distant memory? Is it aesthetically or ethically centered, or somehow both together? And who shapes this world: the haves, the have-nots, or the "have-mores?" How does our world make for A Good Life, and how might the pursuit of A Good Life make, or transform, our world?

To engage and transform the increasingly non-linear and socially complex "wicked problems" that face humanity, *we must re-design how we think*. Ben Lee, Provost of The New School, notes: "Problems such as environmental degradation, sustainability, poverty, financial crises, even democracy, cannot be handled within traditional disciplinary frameworks or national research paradigms."[2] To propose sustainable solutions to these problems *we must also re-think how we design*, working across disciplines and vocations to refocus the mutual influences of design research and practice. Pursuit of "A Good Life" raises questions of personal and cultural identity as well as issues of responsibility and sensuality, addressing the complex weave of forces engaged in developing any given product or system, locally and globally. The following paper reflects on the challenges and benefits of implementing new methods of sustainable design research in thesis year during the first five years of *A Good Life*. Several of the proposals featured in this paper and its "visualization" – including a global project for removing landmines and fashion for mastectomy survivors – have already garnered recognition and are formalizing as real-world endeavors, demonstrating that design can no longer be viewed as the production of discreet, fetishized objects, assembled by linear thinking in isolation of their extended influences.

Why *A Good Life*? Changing the Pedagogical Objectives

Béla Bartók famously declared that musical composition cannot be taught: musical knowledge and analytical skills can be acquired, but the imagination to synthesize the parts into an innovative whole emerges uniquely from an unfathomed talent within. If this is true, can sustainable design be taught? One might respond with another question: how can sustainability *not* be taught as the centerpiece – the assumed basis – of any self-respecting design curriculum? We may choose to attend a concert or not, purchase a recording of a given composition or not, but we cannot avoid the proliferation of *stuff*, tangible and intangible, that inundates everyday life. Due to the crushing ubiquity of design there is an imperative to approach design in a way that considers innovation from a different vantage, changing pedagogical objectives from the traditional barometer of producing students with marketable skills.

And yet, as a tuition-driven program could we risk *not* preparing students to survive in one of the most competitive (and expensive) design centers in the world? Our students arrive from all parts of the world; most hope to stay in New York City, at least for several years to gather working experience. How could we expect them to think and behave differently without jeopardizing their professional opportunities? Furthermore, since graduate study in Product Design is not yet a standard option,[3] most of our students enter directly into the work force and contribute to the cycle of producing yet more *stuff*. True, graduates from Parsons could produce this stuff *very well* – the history of the department is steeped in a craft-based curriculum that fuels an obsessive passion for detail – but could they participate in a broader, more critical dialogue about global issues? Would they have the fortitude to ask themselves – *is a physical object the most appropriate solution for this problem*? How would we responsibly equip our students with the thinking and making skills, and above all the confidence, to enable *them* to equip employers,

[2] Benjamin Lee. "Provost's Convocation Remarks." The New School. www.newschool.edu/admin/convocation/2007/ben_lee_remarks.html (September 6, 2007).

[3] Parsons is currently developing an MFA in Product Design.

clients, manufacturers and consumers with a more nuanced appreciation of the impact of their decisions on the world?

At a career services event with several leading design houses, we received feedback that revealed an opportunity to imagine a convergence of sustainability and marketable skills. *We know your students can assemble attractive portfolios, but to hire them we need to know they will be able to answer the phone*. At first blush, this comment might seem condescending, but it was illuminating: answering the phone is not a demeaning task but a critical skill, reflecting an ability to interpret a new circumstance and direct energies promptly and effectively. The remark signified a need for designers to be agile in *all* analytical modes, whether directing a phone call to the correct person or channeling the respective concerns and efforts of client, consultants and other collaborators. If we are to embrace the range of opportunities for design intervention in world problems, then there are meaningful encounters on all scales in daily experience, all of which factor into the contemporary experience of being a designer.

Since sustainability is systemic and poetic – a mindset – and not merely a new professional skill or accreditation standard to "add-on" to a curriculum, we were compelled to imagine new learning habits for our faculty and students, and reconsider the pedagogical structures to foster them. At the beginning of the first year of *A Good Life* (2003-04), the entire Product Design faculty gathered for a day-long sustainability workshop organized by chair Tony Whitfield. While the most obvious initial step might have been to concentrate on the two "legs" of sustainability already familiar to designers, material and economic sustainability, Whitfield placed special emphasis on examining notions of *social sustainability*, which at the time was a path far less traveled. To focus students' explorations of *A Good Life*, as summarized in a handout, "the department [would] work in collaboration with New York's not-for-profit community to develop design projects that specifically address their missions." In thesis studio, each senior would be required to partner with a not-for-profit group, a real-world component for which there were few references.

In the five years following this initiative, the learning curve has been steep. Early on, the relationships were hit-or-miss, with success relying heavily on a student's personal gumption and good fortune in finding the right group (or more importantly, finding an empathetic person at the right group). Few of the non-profit groups had ever considered working with a designer, and at first many of the students were conscripted as volunteers. With time we grew to realize that this was not a negative but in fact a valuable part of the design research, providing a point of entry to examine user scenarios. It was indeed a real-world test of students' resourcefulness and endurance, but could we build on their enthusiasm and the good will of non-profit participants to strengthen these relationships from year-to-year? After each year we wonder how this aspect of thesis could run more "smoothly." We have held symposia and roundtable discussions early in the fall to facilitate and accelerate the early stages of this process, and developed partnerships with such outreach groups as *Design21*. And yet, reflecting on the recently completed fifth installment of *A Good Life*, perhaps a degree of slowness and uncertainty is inherent, even healthy, due to the fact that each student is searching to identify his or her *own* thesis mission, let alone attempting to match it with someone else's. In fact, for many students each year the search for a not-for-profit group – or *groups* – is a central ingredient, the x factor of their thesis development, tantamount to identifying the essence of their unique personal mission.

To assist with this facet of thesis, a not-for-profit instructor works with the seniors,[4] providing tactical advice and helping them negotiate productive roles with their chosen groups. With time, this role has increased in relevance and complexity, given that the distinction between for-profit and not-for-profit endeavors has become increasingly blurred,[5] generating a hybrid

[4] Since Fall 2007, the non-profit instructor has been Rise Wilson. From experience we have found that this position is best served by a non-designer, to help students appreciate the relationship from the perspective of a non-designer.

[5] Historically, funding from for-profit corporate sponsorships has supported programs through project-based studios – these relationships continue to be important to the balanced growth of the department. With time, however, these partnerships have become more nuanced in their goals, reflecting changing views toward the mutual benefits of sustainability and quality design.

category of “social entrepreneurship” popularly described as “doing well by doing good.” While there are many beneficial aspects to this convergence, the need for critical thinking is highlighted, since there are numerous “wolves in sheep’s clothing” – for-profit entities (such as petrochemical companies) that jump on the bandwagon of sustainability and social consciousness, simply by spinning their public relations campaigns.

To prepare students for the broadened scope of design, we have structured the thesis year to help students recognize and cultivate their aptitudes while earnestly addressing their weaknesses, challenging them to think broadly by forming incisive questions. Specialist skills may be updated or acquired as needed – knowledge of a software program is outmoded even as one graduates – but associative and critical thinking is the foundation of imaginative and sustainable action. Engagement with non-profit groups at the various stages of design development, from researching user scenarios through user testing of prototypes, challenges students to sharpen their communication and listening skills. The project-based learning of thesis year, it is hoped, offers a catalyst to a life-long habitude of problem-solving with design, and a good life, in mind. Based on the first two years of *A Good Life*, we rewrote the department’s mission: *Through an immersion in materials, processes, aesthetic consideration and proactive social engagement, Parsons Product Design Department cultivates the intellectual habits and technical skills essential to imaginatively explore and responsibly integrate the swiftly expanding roles of a successful, professional product designer.*

Is there an “I” in *we*?

At the outset of *A Good Life*, some students, faculty and administration voiced concern that personal expression might be sacrificed by the increased emphasis on social engagement and worldly concerns. Could aesthetic style coexist with ethical pursuits? Would formal inquiry be compelled to play second fiddle to “doing-good”? Would there be enough room for an *I* in *we*? Recalling the ungainliness of solar panels in the 1970’s, it has been often argued that one of the major barriers to earlier, wider adoption of ecological design was its ugliness. How might designers assist humans to aspire to sustainable design for reasons other than “it is good for us” – even when that should reason be enough? Might sensuality be the teaspoon of sugar that helps us absorb our medicine? Perhaps “doing good” could benefit from “doing better.”

In a parallel track, skeptics initially viewed the intensified research necessary to fuel a more comprehensive approach as a *separate* or *additional* scholastic requirement, often placing it in opposition to the more immediately visible products of the design process, such as sketches, mechanical drawings and prototyping. “Too much research” was at times blamed for hindering the design process, slowing the appearance of the familiar evidence of design development. Reflecting on the first two years of *A Good Life*, the increased research did indeed slow this production, precisely because it problematized the way the students had been learning to approach design. Leading up to their senior year, students had been handed a design brief by instructors who framed the problem and outlined the schedule and expected deliverables. Now thesis students were required to identify a problem, clarify a personal mission in tandem with the mission of a non-profit group (and negotiate that relationship), devise sustainable design solutions, realize several prototypes informed by user testing, design packaging and marketing (including on-line components) along with cost analysis and life cycle analysis…all within the final nine months of an undergraduate program. It is no surprise that one of the most important lessons that seniors learn, for better or worse, is *time management*, for the simple reason that they may be facing it for the first time.

The dilemma was circular – in raising our expectations of student performance, how could we as instructors equip ourselves to behave differently in order to equip others to behave differently? To overcome the binary mindset toward *design* and *research* we deliberately merged the two words into *Design Research* and more firmly established the *Thesis Book* as a requirement of thesis completion and graduation. Complemented by a prototype and a final public

defense, this document would articulate each student's thesis argument, summarizing their personal mission, design research and proposed solution, physical and/or systemic, of a specific problem. Since this required students to document their progress in new ways, the position of the "External Critic" was transformed into "Design Research Instructor"[6]; this person serves as a liaison to the thesis-related courses of "Information Design" and oversees assignments geared to stimulate and integrate the various aspects of thesis development. The students' design research is organized and submitted for formal approval at two points during thesis year: at mid-year (December) as a thesis proposal/design, and at year's end (May) as the final *Thesis Book*.

This document proves invaluable in at least two ways. First, it records the conceptual development of a single in-depth, long-term project, providing a comprehensive demonstration of a student's skills and character. Since it far outreaches the standard portfolio (recalling the sentiments of the design houses), the thesis document has been extremely useful to students seeking employment. Second, copies of the book remain with the department, where they serve as irreplaceable reference books for new, incoming seniors. As such, several lineages of projects have emerged over the first five years of *A Good Life*, categorized loosely under the headings of education, ecology, health and well-being, identity and sexuality, disability, safety, politics and poverty: *all* of the projects are evaluated with regard to their extended influences and sustainability. Many projects address several categories.

Another early concern was the likelihood of "repeat" projects from year to year. What has resulted could not have been predicted. There have indeed been many projects that address the same or similar topics, however, each one has been unique precisely because of the singular challenges faced by each student and his or her non-profit relationship, which is irreproduceable. There is also an ethical byproduct: students (especially of recent years) recognize that their work benefits from the hard work of previous students, and that they in turn prepare the way for future students. It is a lesson in humility, grace and responsibility: if they mishandle a relationship with their non-profit it may preclude a future opportunity for someone else. Furthermore, each class of students creates a different chemistry. Although similar topics and categories may emerge, they are manifest differently. Where *A Good Life 4* offered a striking preponderance of Do-It-Yourself projects, much of *A Good Life 5* centered on associational interactivity. Why? Was it something in the air or water? Or was there perhaps an imaginative exchange of I with we?

In any event, in fall 2007, instead of "forgetting" previous student achievements, we embraced them by launching the thesis year with the intensive design charrette "Decomposing a Thesis," for which students selected thesis projects from previous years, quickly analyzed and re-designed them. It was a way of plunging students into the design research mode and avoiding the often-paralyzing question of *what is your thesis mission?* In Fall 2008 we will begin *A Good Life 6* with the same exercise: based on our learning curve, the anticipated results should be familiar yet *different*. The legacy of proposals for *A Good Life* is testament to the understanding that project-based learning is an egalitarian process where students learn from one another, and the instructor facilitates rather than imparts ideas. To further the Parsons Product Design mission, the following learning objectives have been set for thesis year:

- **stimulate lateral thinking** to form unexpected links and identify necessary skill development;
- **encourage social intelligence** in a world and profession where teamwork is in growing demand to address complex problems;
- **challenge individual development of multiple intelligences** in a group dynamic, fortifying personal confidence in what one is "good" at by teaching others, while reducing fear of one's own "weaknesses" by learning from peers and "the task at hand."

[6] Patricia Beirne was hired as the first "Design Research Instructor," a position she has maintained from *A Good Life 3-5*.

Concluding proposal…

Returning for a moment to Bartók's argument, there is another implicit lesson offered by our experience with the question of "repeat" projects. It is more effective and enduring to unleash an imagination rather than require it. This happens most naturally when we are fully invested in an endeavor. The more deeply we care about an issue, a project, the more we seek its continued growth and prepare for its ultimate success by trying to imagine all of its parts, its strengths and failings. Through the thesis inquiry of *A Good Life* our seniors are compelled to build on their strengths and diagnose their personal demons, proposing a vision for the world that is also a renewed vision of themselves, each as a prototype of an argument that is familiar, yet different.

As traditional boundaries between industry and the academy realign at the ethical and economic stimulus of sustainability, a lateral approach to design research is increasingly in demand. Designers are called on to conceive and orchestrate problem solving for complex, non-linear issues, often in interdisciplinary teams. In this context, the design process offers analytical and synthetic methods to appreciate the global impact of local conditions and the local impact of global conditions. The academy offers an ideal, multi-faceted and self-reflective engine to generate sustainable solutions. For this reason, we cannot any longer afford to separate between "industry" and "academy," or "academy" and "real-world." The academy *is* real-world. This is my proposal.

…and links to two others

Regarding Hilary Boyajian's project *Chikara* (from *A Good Life 2*), which set an early standard for thorough design research:

"The outgrowth of Hilary's original thesis is her recently launched clothing line, Chikara, which, implementing the findings of her thesis research, produces high-fashion, flattering, comfortable clothes designed to accommodate women whose post-surgery bodies reflect the changes—including shifting and asymmetry—that a lumpectomy, mastectomy, or double mastectomy will create… The answer to the dissatisfaction these survivors were experiencing [in existing clothing options], Hilary felt, lay in creating a fresh, modern clothing line that 'created the notion of prosthesis externally rather than internally.'"

- excerpt from "Fashion and Function," *Women and Cancer Magazine*, Diana Price

See also: http://www.chikaradesign.com/

Regarding Hideaki Matsui's project *CleanUp* (from *A Good Life 3*), a powerful example of creating global change in simple ways:

Q: Do you think designers have a responsibility to be concerned with world affairs?

A: Don't you think it's great if your creativity makes our world better?

- excerpt from "The Student Design Review," I.D. Magazine, September 2007

See also: http://www.hideakimatsui.com/

Fig. 1: Hideaki Matsui's "Cleanup," completed in 2006 for *A Good Life 3*, received the "Best of Category" in I.D. Magazine's 2007 Student Review. In his thesis documentation he writes: "I chose soap as the product to promote the eradication of landmines because people use soap everyday. As someone cleans their hands with the soap, they can help clean the world of landmines."

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design-Oriented Futures Wheels

Using Foresight Methodologies in our Design Schools

Cindy Kohtala[1]

Abstract

This paper explores two specific futures studies methods, with the aim of adapting them particularly for design students at the post-secondary level. It describes in detail the steps a workshop facilitator can take to guide students through the process of a Design-Oriented Futures Wheel and a Design Causal Layered Analysis workshop, the former also using a Futures Table as a tool. The objective of these workshop models is to promote systems thinking, impact analysis thinking, and scenario visioning skills. The topic of this activity has been motivated by the author's personal interest in foresight methodologies and how they may promote a positive combination of design thinking and sustainable solution development.

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1. Introduction

This paper introduces a simple workshop model(s) for design students based on futures and foresight methods. The aim of the workshop is to familiarise design students with certain futures methodologies in general, and thereby systems thinking, as well as to provide them with conceptual tools for scenario building; to illustrate how issues are socially constructed by various groups with differing worldviews; and to direct their attention to the long-term impact of their activities. The author assumes that focus on the latter two issues is rather weak in many design programmes even today, and students can only benefit from a more thorough discussion on long-term technology impact assessment, trend impact analysis, stakeholder analysis and ethics in design practise in general. It is therefore plausible to see this workshop as operating in a BA or MA programme as project or course introductory material and/or as forming part of a curriculum module under the theme of systems thinking, design ethics or similar. The workshop platform is basic, flexible, and discussion-based and can thus be adapted to local needs and themes. It can be seen as a step towards encouraging a ‘macroscope’ view of the world, as opposed to, or preferably in combination with, the ‘microscope’ view and micro-level knowledge traditionally required by product design activities (see Thackara 2006, 6).

The workshop focuses on the use of the Futures Wheel and Causal Layered Analysis as methods and the Futures Table as a supplementary tool. The first method is especially simple to understand and implement but leading the activity does require some experience or careful facilitation, as it may easily result in “intellectual spaghetti” (Glenn 2003, 10). It is a brainstorming approach, but a structured and systematic one. It can stand alone as a discussion tool or be combined with the Futures Table or other matrix tool in order to develop scenario parameters. A further application could move towards eco-innovative product/service development brainstorming.

The second method, Causal Layered Analysis (CLA), is far more conceptual and requires sensitive facilitation. It too can stand alone as a discussion and thinking tool or can be used as a platform for the development of various kinds of scenarios or vignettes. If the purpose of the Futures Wheel tends more towards mental mapping, the aim of the CLA method is to eventually propose measures: in essence, to design how the future could unfold and change/be changed for the better.

While the Futures Wheel considers horizontal linear-time-based impacts, CLA explores the vertical layers of (as a likely example) sustainable development issues before moving horizontally forward to future speculation. Each method requires a certain type of analytical thinking and benefits from, ideally, incorporating certain scientific or other expertise that neither design students nor design lecturers necessarily have. For these reasons, the workshop template(s) developed for this paper suggests a set of design-relevant questions and structure proposals. The goal is that with this simple set of instructions and leading questions, any lecturer anywhere can conduct Design Futures Wheel and Design CLA exercises with only paper and pen.

This paper will thereby concentrate on the practical details of conducting workshops based on these two methods specifically. A more general discussion and evaluation on how futures and foresight methods in general are adaptable to the design education context will be left for future study. This paper is a preliminary study in preparation for future doctoral studies for the author. The workshop template(s) is thus undergoing continuous testing and improvement.

2. The Futures Wheel

The Futures Wheel was developed in 1971 by Jerome C. Glenn as a method to identify and organize the primary, secondary and tertiary consequences of events, in a structured brainstorming approach that intends to create a mental map of the future (Glenn 2003, 3-4). It is related to mind-mapping but more clearly sets out the various levels of impacts as they occur in time and is thus useful in further forecasting and scenario work. In Glenn's own words, the "Futures Wheel also helps move the mind from linear, hierarchical, and simplistic thinking to more network-oriented, organic, and complex thinking" (Glenn 2003, 9).

A Design-Oriented Futures Wheel as proposed in this paper is one in which a design proposal, social trend, design-relevant event, technological development, or similar, is defined verbally and placed in an oval in the centre of the paper. The immediate consequences of this event are then discussed; they may range in scale from micro to macro, and may, or should, cover a range of sectors. (There is no need at this point to limit the discussion to the design field and its implications.) Each effect is put in its own oval and all are drawn going around the central topic in a circle. Each primary effect in turn will trigger a secondary effect or effects, and these subsequently a third, tertiary effect. The primary, secondary, and then tertiary impacts (or first order, second order and third order) are thus placed in the wheel in their respective circles radiating outwards. Arrows or spokes indicate connections between the impacts. Colours or differing line weights may also be used to differentiate the impact levels and clarify the cause-effect relationships.

The facilitator may pose questions in order to structure thinking and identify likely (not too far-fetched) impacts. These questions can address, for example, sector-based issues, according to Glenn's Version 2 Futures Wheel (see Glenn 2003, 11). Sample questions would ask: what is the cultural impact of this event? What impact will this have on the natural environment? What are the political consequences? In the author's experience, following this kind of STEEP or PESTEC framework is extremely helpful in advancing the discussion, and in the workshop slideshow the image of the sectoral wheel by Glenn has been used by the students as a constant reference point (see Fig. 1). (A STEEP analysis considers the sectors of Social, Technological, Economic, Environmental or Ecological, and Political. PESTEC adds the sector of Cultural.) Students should consider what areas are important to their topic and add them accordingly. In Glenn's example of a Version 2 Futures Wheel (Fig. 1) he adds the areas of Educational, Psychological and Public Welfare Impacts to the PESTEC sectors in his consideration of 'African economic integration'. A Design-Oriented Futures Wheel will have design-relevant sectors – one could even suggest Aesthetic Impacts. This leads to the point that it is likely the students will hover around the general or the specific: if they are concentrating too heavily on only design-based issues, the facilitator may broaden the scope by introducing a PESTEC consideration. On the other hand, if the discussion remains at the wider macro level, the facilitator may ask about design-related details (such as aesthetics, consumer behaviour, or other, even more specific, considerations).

Facilitator questions can also be related to normative evaluation: if the impact is considered to be positive, negative, or neutral. It should be remembered that the wheel does not represent one particular future but many possible future corollary chains; positive impacts as well as their antithetical negative possibilities can appear on the same wheel. As will be explained below, this could in fact indicate a useful element for the later Futures Table and scenario space work.

The Futures Wheel may incorporate time-based elements (the dimension of past time and how a trend evolved), if it is clearly marked which event leads to which. (See comment below on Cmap Tools and labelling connectors.) This can also be accomplished by creating a more complex 'Version 3 Futures Wheel', which looks rather like an hourglass (see Glenn 2003, 12) and includes the dimensions of historic forces, the current situation, and future implications. Here the main Trend or Event remains in the centre of its wheel of 'current impacts', but the spokes also extend from the central Trend up the 'hourglass' to 'future consequences' and down the 'hourglass' to 'historic forces', in a kind of isometric projection.

No matter the form of the wheel, as the discussion continues, the complexity of the interactions will increase and may become overwhelming, resulting in the conceptual spaghetti mentioned above. The facilitator should heed where there are clear gaps in the wheel, un- or under-considered issues, and when it is time to move to the next step. (In some cases blocks in the brainstorming process or conceptual lock-ins can be unblocked by working on the Futures Table at the same time. See Fig. 2.)

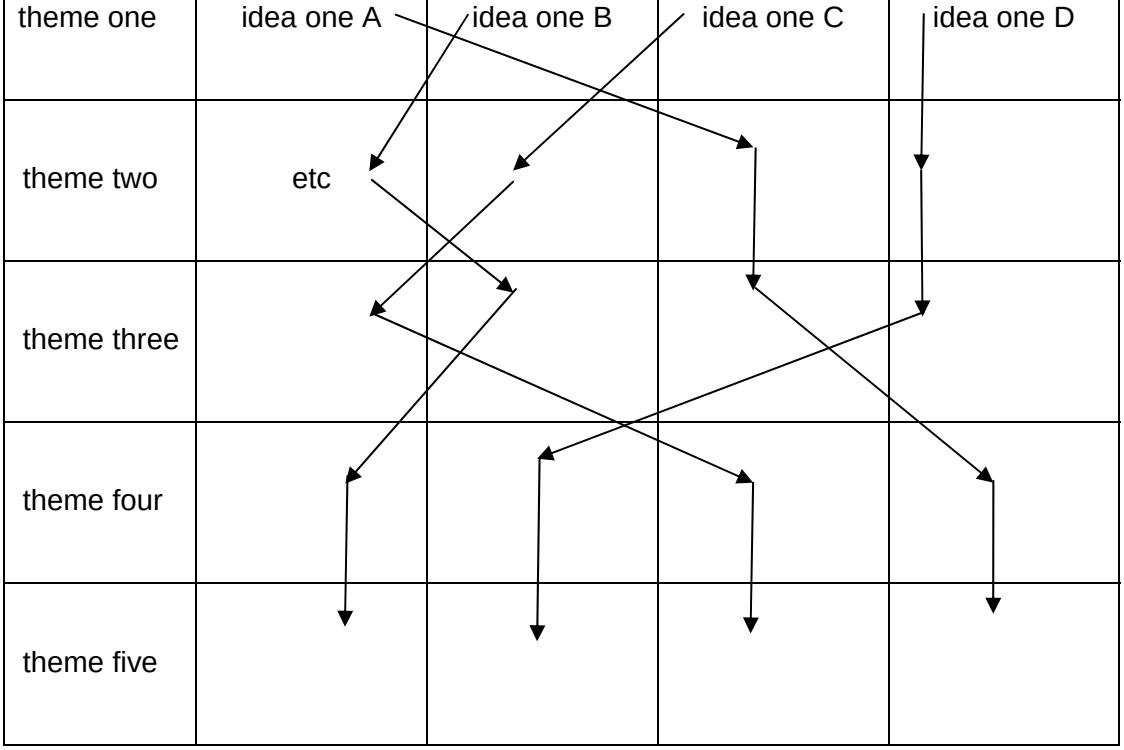
Moreover, it can be problematic for students to determine if an impact is truly primary or in fact the result of an intermediary event that is not immediately evident. (There can be some surprising, even disturbing, cause-effect chains that are not visible in our day-to-day existence.) It is furthermore possible to mistakenly connect events that are correlated but not necessarily causally related (Glenn 2003, 9). These are points considered useful to be kept in mind; there is however no need to over-intervene in the students' thinking processes.

The Futures Table. After sufficient consideration (the author suggests at least two hours for the entire workshop) the facilitator introduces the Futures Table exercise, in which the students begin to classify and organise the outcomes of the Futures Wheel discussion. The Futures Table is a way to structure futures information that lends itself nicely to scenario development. The left vertical axis of the table lists the key themes or variables that the participants believe are most crucial to the topic to hand. In this workshop, these themes may accord directly with the sectors (for example, PESTEC), some sectors may be divided into sub-themes or defined more specifically (for example, health, design education), and some megathemes may be included (for example, values in a STEEPV framework).

On the top horizontal axis are listed four (or at least three) choices of 'vision': A, B, C, D. These will represent four alternative visions of the future. For each vertical theme, the students imagine four different alternatives, four realities, based on their Future Wheel discussion (for example, health: A – totally privatised health care for the wealthy; B – extensive public health care system funded by taxes; C – clear separation between public and private services but both available; D – mostly private providers but state-subsidised). It is possible and helpful to think of the alternatives as positive, negative, as today or most likely, a surprise. Another helpful starting point is to see if there are obvious polarities or contradictions already developing in the Futures Wheel (positive and negative effects). This may indicate critical issues: how the same event can lead to different reactions, decisions and end results.

When the table is complete the students should draw connections between those cells that most logically match with each other (see Table 1). (For example, is it likely that an extensive public health care system would exist in a society with extreme individualistic values?) These four visions can then be given a name (metaphors make colourful, expressive names) and the vision results presented in a plenary session.

	A	B	C	D
theme one	idea one A	idea one B	idea one C	idea one D
theme two	etc			
theme three				
theme four				
theme five				



"vision one" "vision two" "vision three" "vision four"

Table 1: Futures Table. Making logical visions out of various elements/characteristics according to relevant themes.

It is recommended leaving sufficient time for the plenary session for presenting results and discussing the process. During the same workshop or for future project work, the table and wheel can further be used for eco-innovation brainstorming. Here, the students can give deeper consideration to the following points: the 'surprise' element (if one of the table's visions is "business as usual", what would be a surprising yet positive antithesis to this?); the events considered to be opportunities or threats in the wheel (what is the business opportunity here?); how one would avoid the 'negative' scenario elements; and how designers could work to reach the positive, preferable one.

Practical considerations. Allowing the students to decide on their own topic is considered problematic and takes significant time away from the actual wheel-building activity. It is recommended that the facilitator provide the topic or a choice of two or three topics only. The issue should be considered wide enough to generate challenging dialogue and allow the inclusion of sectors perhaps previously unconsidered by design students (such as the political impacts of a certain trend, or geographically distant impacts). It should also be narrow enough to work with manageably. There should obviously be an element that touches the heart of design activity and design-for-sustainability and, if applicable, the particular sector or topic the lecturer wishes to address. If the next project to come is Eco-Tourism Service Design, for instance, the Futures

Wheel workshop could lead into the project with the topic Ever-Increasing Global Tourism or similar.

The author has had success with the following topics:

What happens if the price of oil reaches $160 a barrel? (For example see Fig. 3.)

What happens if people start doing more for themselves? i.e. Wikinomics, open source lifestyles, expert users, prosumers, ProAm…

What will result if more and more of our tools and products become electronic?

It can be considered positive if what turns out to be design relevant or influencing design is surprising, in view of learning something from impact assessment. If this is the case, or if a design connection is not so apparent, this could also contribute to any eco-innovation discussion as mentioned previously.

Obviously it is up to the students to decide how to fill in the Wheel: the discussion on some impacts will naturally (even excitedly) lead from primary to secondary to tertiary, from inner to outer circles. Some groups will be naturally more systematic and fill in each circle as completely as possible before moving to the next outer circle. If the discussion seems to stall, the facilitator can point to gaps in the wheel or suggest other relevant areas.

Finally, the facilitator may also suggest using labels for the connecting arrows to inspire new ideas. This is at any rate necessary if one uses mind-mapping software such as Cmap Tools to create the wheel; as each arrow must be labelled, creativity can be used beyond simply “leads to”. Relationships may be indicated by the positive, negative, or neutral mentioned above, or qualifications such as “supports”, “helps in”, “very likely”, “not so likely”, “opportunity”, and “threat”.

3. Causal Layered Analysis

CLA is used here as a second futures method for adaptation because a Design CLA directly addresses the myths, assumptions and social discourses that surround design, technology advancement, and sustainable development. This can allow for deeper scenario work subsequently, as well as a deeper discussion on transition management, path dependence, and barriers and leverage points: in other words, how change can actually be effected. The latter capacity and the participative element make CLA comparable to for example Jungk’s Future Workshops (see Bell 1997, 300-5).

CLA was developed by Sohail Inayatullah in the early 1990s in order to focus on the vertical layers of discourse that may not be revealed by the more horizontal spatiality of foresight methods such as backcasting. These layers include myths and metaphors (the often emotive, archetypical, or unconscious dimensions of the problem or issue) and the “litany” (the surface, ‘knee-jerk’ reactions to an issue that may render a person helpless or fearful) (see Inayatullah 2003). This activity serves to expose how issues and problems are framed in society and how this framing limits true understanding (see Scenarios for Sustainability).

A Design CLA can follow a Design Futures Wheel in order to intensify the discussion or may be conducted separately. As with the Futures Wheel, the facilitator of a Design CLA uses a set of design-oriented questions in a discussion-based, environmental-scanning exercise to explore Inayatullah’s four levels: litany, social causes, discourse/worldview, and myth and metaphor. The goal is to deepen design students’ understanding of their work, their role in society (both perceived and desired), and, again, the impacts of their activities. Also like the Futures Wheel, a Design CLA encourages discussion on values and visions in the quest to define preferable future(s).

In the example by the author, the issue of the Baltic Sea is at focus, as it has many political, social, transnational, ecological, cultural and emotional perspectives that deeply affect many in northern Europe. (The previously mentioned topic of ever-increasing electronics could be

considered to be more design-relevant. With the Baltic Sea discussion however, as with any environmental or sustainable development issue, the role of design and designers can be raised in the latter part of the discussion.)

The facilitator may begin by eliciting general ideas on the topic. In the case of the Baltic Sea, comments are often quite predictable and tend towards finger-pointing, blaming other nations for the pollution. This is typical and leads easily to explaining the first levels of CLA. In other words, comments from the brief introduction discussion, no matter the topic, will almost certainly belong to the first two levels of litany and social causes, and the facilitator can then make this evident.

1. Introduce the layers. The LITANY (level one) is the most superficial layer of analysis. It can be considered the official public discourse on the topic, which is usually presented in newspapers as (often exaggerated) problems, quantitative trends, events and issues that do not appear continuous or connected. The result from the student's or participant's point of view is a feeling of helplessness or apathy (see Inayatullah 2003, 7). "It's St Petersburg that dumps all its sewage in the Sea." "It's the cruise ships who illegally empty their wastewater in the Sea to avoid harbour charges." "The government should do something." The facilitator should ask what students have read about the issue in the newspapers, to collect all topics and opinions, and can even bring in articles as evidence.

The SOCIAL CAUSES layer (level two) delves deeper into the topic in a more systemic way. Here information is more likely to be found in the editorial section of the newspaper as well as policy institutes and academic journals, in the form of quantitative data and interpretation, technical explanations and academic analysis, and even analysis of the precipitating action (Inayatullah 2003, 8). The students should here give deeper consideration to their former 'litany' statements and discuss where they would find richer, 'truer' (or at least semi-scientific), information on the topic. A STEEP or PESTEC framework is also recommended; students should talk about the economic, cultural, political, and historical factors involved. The facilitator and/or the students could also find examples of studies and reports that would help separate the fact from the fiction. In the Baltic Sea case, the author was rather surprised to learn the immensity of the impact Finnish agricultural practices have on the 'health' of the Baltic. (As this information came courtesy an enviro-biologist researcher currently studying the Sea, it could be worth considering inviting experts to the discussion if feasible.)

The WORLDVIEW layer (level three) goes deeper still. The facilitator should stimulate discussion on the various stakeholders, discourses and worldviews involved. What are the deeper social, cultural, linguistic, economic, and religious structures underlying the topic – or, in truth, constructing it (see Inayatullah 2003, 8)? Who are the various players, and how do they view the issue? Why? The workshop leader should be wary of stereotypes and overgeneralisations here, and together the group should try to paint an accurate picture of who is included, what forms the essence of their discourse, and why, if that question is answerable. In the Baltic Sea case participants were discussing if certain nationalities (or sub-cultures) have a different worldview because their philosophical or ontological relationship to 'nature' and the environment differs: a resource to be exploited like a road or a mine; a pristine thing to be kept isolated from human activity; something that brings back memories of childhood; or a source of spiritual energy and enjoyment. Finns like to claim the last of these.

This begins to lead to the fourth level, the MYTHS AND METAPHOR layer, which contains the deep stories, collective archetypes, the unconscious and often emotive dimensions of the problem or paradox. It includes folk sayings, fairy tales, ancient stories, and even marketing slogans (see Inayatullah 2003, 8, 10). Can the students uncover the myths behind the discourses mentioned earlier? What are the metaphors in play: is the Baltic Sea a road, a toilet, a sailboat's playground? How do artists and philosophers view the topic?

2. Causes and alternatives. In the next step the students should discuss the topic at each level with more of a problem-solving approach, in both identifying causality and then, most importantly, considering alternatives. A CLA table may be used as a tool (the tables in this example have been adapted from Inayatullah 2003, 32). As becomes evident, this analysis goes

through a step-by-step process similar to the Futures Wheel, but while the Futures Wheel extends the topic outwards in time and cause-effect, CLA extends down into the depth of the issue.

At the litany level, the facilitator may ask the following (see Table 2):

What would a current, overdramatised newspaper headline about this topic look like? (See Scenarios for Sustainability.) Who is responsible for the solution? What are the most appropriate short-term solutions?

Level	Problem	Solution	Who can solve it?	Source - information
Litany Official public discourse	Problem seems difficult to solve or easy to solve as depth is not seen	Short term approaches	Government	Television Newspapers
The Baltic Sea litany	What are the problems? Causes? Most visible characteristics?	What can be done? What are the 'instrumental' scenarios?	Who can and should solve these problems?	

Table 2: Causal Layered Analysis Table, Litany layer

At the social causes level, the facilitator may ask the following (see Table 3):

How and why did the issue arise? Who is involved? What is the source of the litany? Why was it presented? Who is being quoted? What are the underlying causes? (Scenarios for Sustainability) What role do designers or the design industry play now, if any? What partnerships could designers form to help solve the problem? What specific part of the problem can designers address? How does design research and theory inform the issue?

Level	Problem	Solution	Who can solve it?	Source - information
Social causes Systemic social science analysis	Problem because of short-term historical factors	Integrated approaches – systemic solutions	Partnerships between different sectors of society	Policy journals, editorials
The Baltic Sea system	PESTEC analysis	What is being done, by whom? What are the 'policy-oriented' scenarios?	Who can solve these problems? What partnerships can be formed?	

Table 3: Causal Layered Analysis Table, Social causes layer

Facilitator questions for the third, Worldview, layer may proceed as follows (see Table 4):

How has this type of issue arisen over time? Who are the stakeholders? What are their values? Who usually talks and lobbies about this issue? What do they stand to lose or gain? Who has the most control over the issue, and what are these dominant values? How are other, more marginal viewpoints controlled or contained? What is being written in fringe/periphery journals about this issue? What would happen if these other views became dominant? (Scenarios for Sustainability; Inayatullah 2003) Where does mainstream design fit in? Does it support the dominant worldview and hold the same values? Is design discourse related to this topic "part of the problem" or "part of the solution"? How? How could designers support the work of the 'preferable paradigm' stakeholders?

Level	Problem	Solution	Who can solve it?	Source - information
Worldview Discourse, paradigm	Constituted by frame of analysis – deep structure	Transform consciousness, change worldview, rethink self and others	Writers, philosophers, those outside the dominant discourse	Peripheral journals, ideological journals, philosophy courses
The Baltic Sea discourses	How is the problem seen in the Big Picture? What is the dominant worldview?	How else can we frame the issue? What are the 'worldview' scenarios?	What are the problematic worldviews, and how can they be adjusted?	

Table 4: Causal Layered Analysis Table, Worldview layer

At the final and most challenging layer, that of Myth and Metaphor, the facilitator may lead the discussion thus:

What is an image or phrase that encapsulates what has been uncovered so far? What work of fiction, movie, poetry, art, etc. evokes an image of the issue being discussed? Are there any myths that may constrain thinking or acting in relation to this issue? (Scenarios for Sustainability) Has design as an artistic and cultural form played a role in constructing and continuing the myth? What myth? How can designers as cultural leaders "change the story"? Alternatively, how can they 'promote' a myth considered socially and environmentally sustainable?

Level	Problem	Solution	Who can solve it?	Source - information
Myth and metaphor	Constituted by core myth, derived from an often traumatic or transcendent event	Uncover myth and metaphors and create processes to imagine alternative stories of what it means to be. Cannot be rationally designed.	Collective unconscious often guided by visionary, mystic leader	Works of artists, visionaries, mystics, and certain movies

		Emergence is necessary.		
The Baltic Sea deep stories	What is the underlying story, the underlying assumptions? The root metaphor?	What are the alternative metaphors? Preferred visions?	Who can create these new stories and images? How can they be legitimised?	

Table 5: Causal Layered Analysis Table, Myth and Metaphor layer

3. Changing the story. The actionable steps at this myth layer and the discourse layer are obviously much more difficult and long-term in scope (Inayatullah 2003, 11). However, in Inayatullah's own words, "[d]econstructing conventional metaphors and then articulating alternative metaphors becomes a powerful way to critique the present and create the possibility of alternative futures" (Inayatullah 2003, 9). Given free rein to unleash their imaginations, it is likely the students can create a new insightful, metaphorical, imagery-based vision, or amplify an existing one. This could even be done through illustration, poetry or drama if time allows.

The facilitator could now guide the students back up through the levels (or have teams tackle layer one, two and three individually), based on the ideal, preferable metaphor. (3) Worldview: how can designers, as professionals or citizens, help effect a shifted worldview, to move the framing of the issue to match the ideal vision? How can design work match this preferable worldview? (2) Social causes: what are the longer-term and shorter-term policies that should be effected, and by which groups of people? (Be specific.) (1) Litany: what are the official policies that should be enacted, and how should they be represented, for example, in the media? What are the regulatory priorities in the short term?

In the Baltic Sea example, a visionary metaphor may call to mind a sailing paradise; a smooth, blue, pristine surface with a delicate understructure that cannot tolerate foreign elements; an enclosed 'swimming pool' of sorts, where inputs have no safe escape route; and so on. The challenge in the workshop is to discuss how to rethink relationships and structures, and how to lead alternative groups (farmers, cruise ship and transport ship operators, coastal land owners, politicians, the list goes on) to a shared worldview where public and individual policy protects the integrity of the Baltic environment.

Practical considerations. The author admits that this workshop is rather difficult to conduct and even more difficult to gain a sense of achievement or progress, being still on the learning curve. It may be helpful to do preparatory research on stakeholder groups and state-of-the-art research findings to help the students move forward. It is important not to remain at or return to the litany level, such that after an afternoon of discussing, the students still feel that "somebody should do something". At the same time, brainstorming practical, shorter-term measures brings the issue to a clearer reality that is truly actionable: the students will have less a tendency to remain too idealist and 'hippy-dippy'. Ultimately the ability to reframe issues and rethink relationships will prove to be a valuable skill in future when one thinks of the challenges in promoting sustainable consumption, developing eco-innovative products and services, and defining one's career and life path.

In conclusion, the ultimate aim of workshops such as these is to sensitise design students to foresight activity and foster foresight ability: "The purpose of foresight is to look for what other people do not perceive; to cultivate that ability requires practice" (Loveridge 1999, 1). Foresight entails a combination of structured and tested information with subjective opinion and pattern recognition; it concerns *analysis* less than *synthesis* and *synthesisers* (Loveridge 1999, 14). The

author suggests that designers and design students are proficient at synthesising the rational and the intuitive; promoting futures thinking is therefore not a difficult step but is a crucial one in these times of uncertainty and constant change.

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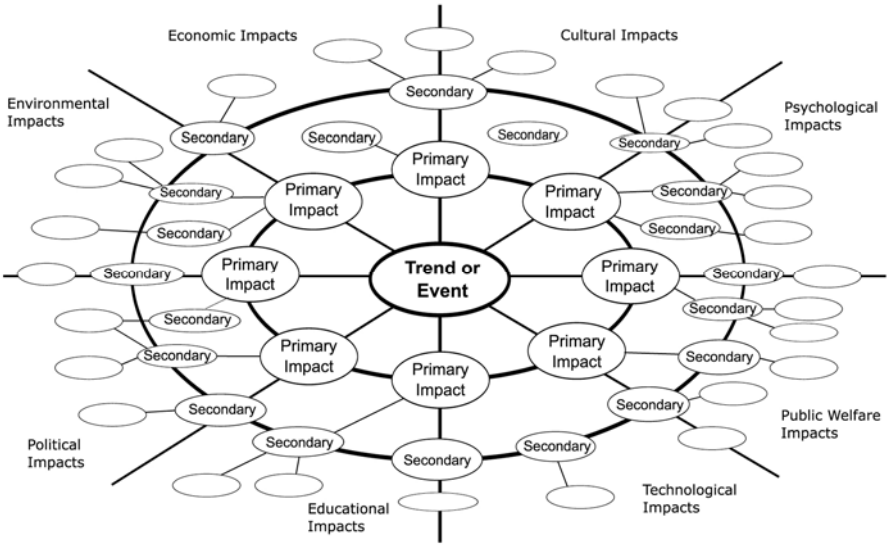

Fig. 1: A Version 2 Futures Wheel with sectors (adapted from Glenn 2003, 11)

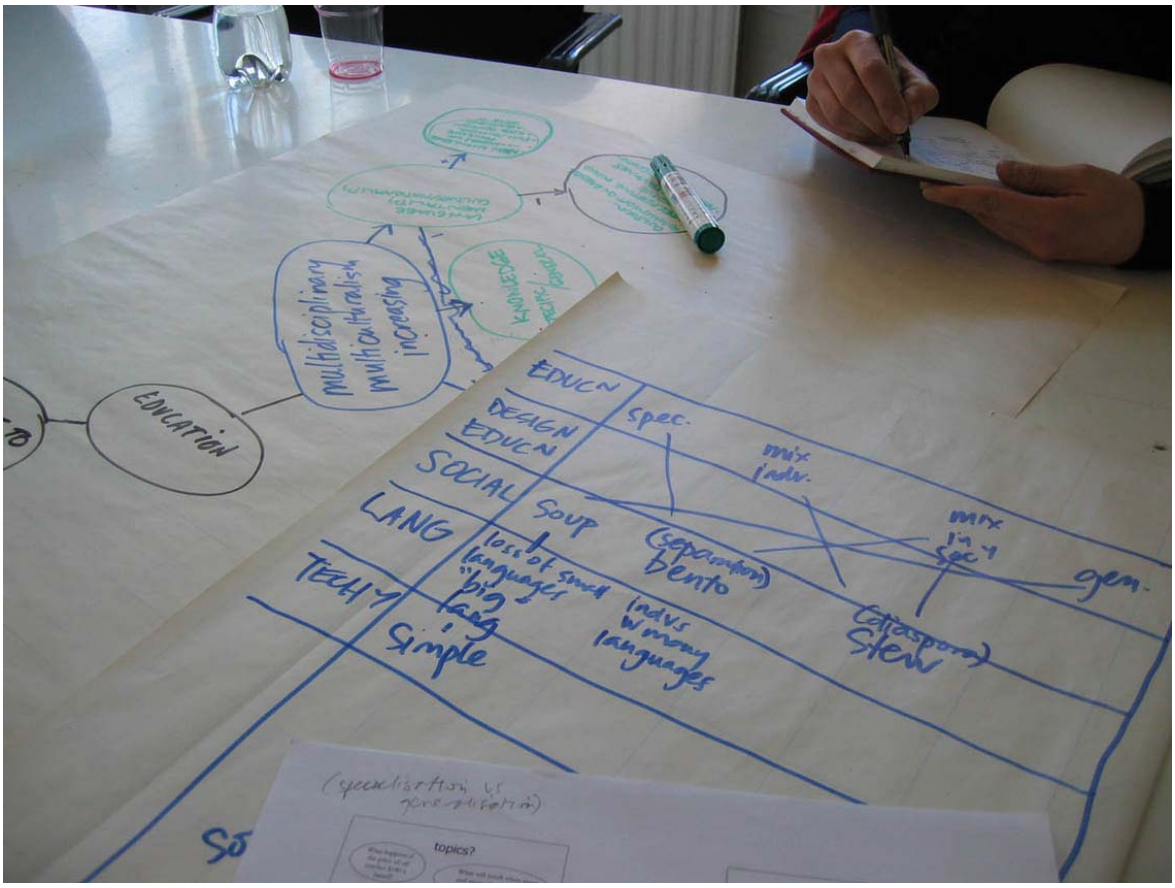

Fig. 2: From the Futures Wheel to the Futures Table

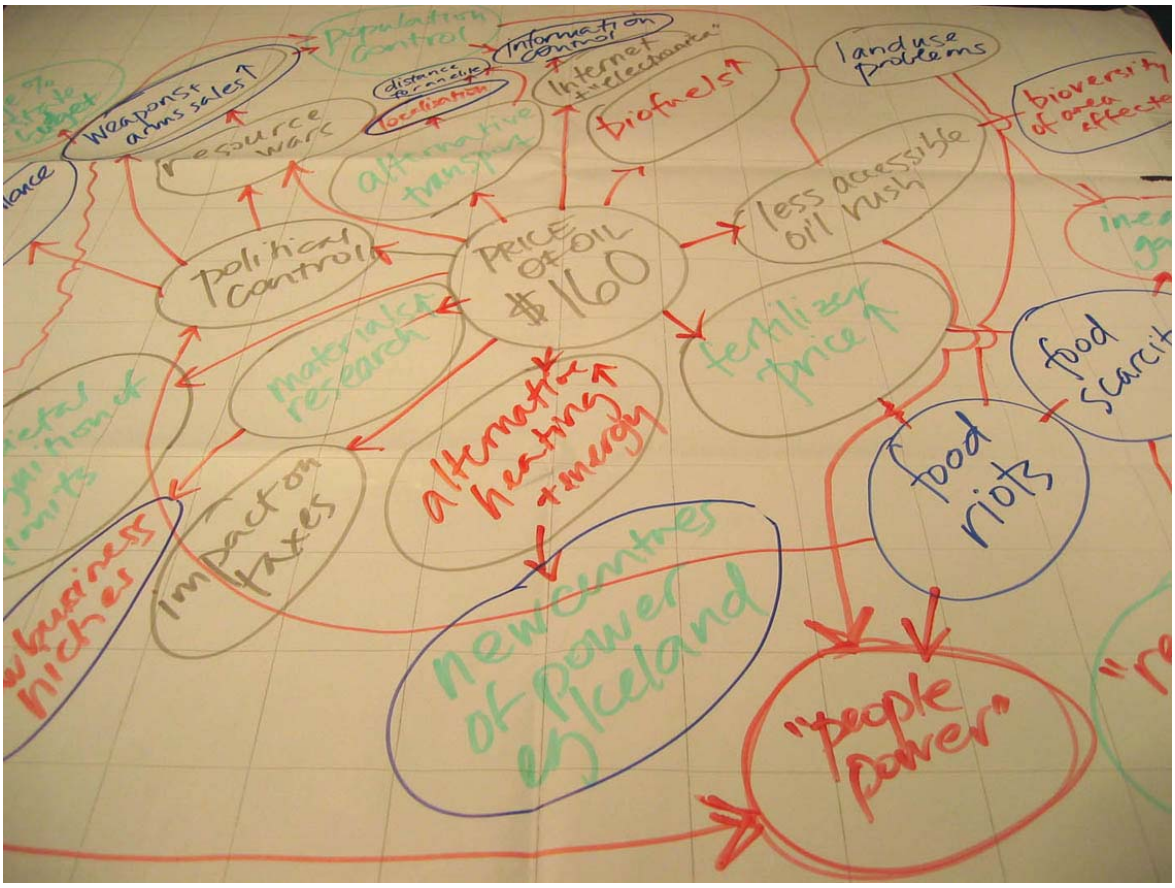

Fig. 3: Futures Wheel

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Reconstitution of the Domains of Everyday Life

A tool for assessing the health of existing conditions and a framework for designing sustainable solutions based on principles from the natural world

Gideon Kossoff[1]

Abstract

The interconnected issues facing humankind at a global scale must be addressed holistically at the level of the everyday if we are to transition to a sustainable society. This paper proposes a holistic framework within which an ecological critique of everyday life can be made and from which alternatives can be developed. The framework brings together 4 strands of thought that include: 1) Everyday life as the context for social and environmental issues 2) holistic principles from the natural world 3) a theory of needs and their satisfaction 4) nested, networked, self-organizing and emergent social forms. This methodology is used to disclose underlying principles of 'wholeness' found in pre-industrial societies in order to understand the shortcomings of modern society.

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1. Introduction

Social, cultural and ecological systems worldwide (life support systems) are in decline. The air we breathe, the food we eat and the water we drink as well as the buildings and streets, cities and countryside which we inhabit, are all part of an immensely complex web of life whose ecological, social, economic and cultural problems cannot be disentangled from one another nor addressed in isolation. Transitioning to a sustainable society requires methods for addressing these issues in an integrated and holistic way. In this paper I propose the application of holistic principles to everyday life which has the potential to bring about a reconstitution of the essential forms within which everyday life occurs; our households, neighbourhoods, villages, towns, cities and regions, and, ultimately, the planet itself. Such a rebirth of these archetypal social and cultural forms is necessary if we are to achieve what Manzini and Jegou refer to as the 'sustainable everyday' (Manzini and Jegou 2003) .

2. Everyday Life as the starting point

"It is the everyday that receives our 'daily inattention'" — George Bataille (Highmore 2002, 21)

Although it is the most fundamental level of existence, there has been relatively little systematic thought devoted to everyday life. Social critics such as Henri Lefebvre (1901-1991), Guy Debord (1931-1934) and Agnes Heller (1929-) have argued that everyday life, especially since the Enlightenment, has been trivialized, denigrated or simply ignored by mainstream Western thought. Sociologist Michael Gardiner argues *"With the transition to modernity, and the fracturing of the social world into a multiplicity of specialized practices, everyday life emerges as something that is 'left over', and hence of little consequence in relation to such 'superior' pursuits as politics, the arts, or science"* (Gardiner 2000,11). The lowly status of everyday life has legitimized the dissociation of specialized disciplines from it (economic, political, technological, healthcare, the arts, design, education, architecture among others), and they are now presided over by experts. These specialisms and the fragmented and increasingly abstracted knowledge they generate relate at best, to *aspects* of everyday life, but bear little correspondence to life *as we live it*. Guy Debord spoke of the *"evident will to hide behind a development of thought based on the separation of artificial, fragmentary domains so as to reject the useless, vulgar and disturbing concept of 'everyday life'.... Modern society is viewed through specialized fragments that are virtually incommunicable; and so everyday life, where all questions are liable to be posed in a unitary manner, is naturally the domain of ignorance."* (Debord 1961,239-240) The irony is that everyday life is reduced to *"a domain of ignorance"* yet much of it is designed and organized according to the dictates of an "expertocracy" (Andre Gorz cited in Gardiner 2000, 5) The result is the fragmented physical reality of our daily experience.

In order to transition to a sustainable society, we must apply holistic thinking *directly* to everyday life. A framework is needed which integrates all of its aspects without mediation from specialized disciplines or fields of expertise. This is not to say that specialisms should be eliminated, but rather they should operate within the context of a holistic framework which is *prior* to specialization.

3. Holism and human affairs

Holistic principles

The basic premise of my argument is that the same principles are present in healthy living systems (e.g. organisms, ecosystems, and the planet itself[2]) as in robust, sustainable societies. In recent decades there has been renewed interest in holism from science, popular culture and alternative healing disciplines, however it remains marginal in the contemporary social, political, economic and cultural discourses. In this paper I argue that there is a rich social 'organicist' or 'holistic' tradition that is of great relevance to sustainability practitioners and activists. In order to become a useful method for critique and design, the holistic tradition must transcend its past shortcomings and embrace contemporary concerns and new insights into the interdependent and networked structure of natural systems.

Since the Ancient Greeks using the metaphor of a living organism to understand and help order society has been a recurring theme in Western thought. Referred to in this paper synonymously as *Holism* and *Organicism*, this concept has been found either implicitly or explicitly within many political, social and economic philosophies and has been remarkably consistent it its application of holistic principles to society, but not necessarily in its conclusions (Phillips 1976).

The key principles adopted by social holists[3] are 1) 'emergence'; the concept that the whole is different and greater than the sum of the parts, 2) 'interdependence'; the idea that everything within a whole affects everything else, and 3) 'self-organization'; the structure and behaviour of a whole arises from within and is independent of external forces[4].

A 4th holistic principle that has yet to find its way into mainstream social theory is that of 'holarchy' and is perhaps the single most important idea with respect to the design of a sustainable society. This idea emerged out of twentieth century systems theory and posits that wholes in the natural world exist within extensive nested and networked structures. Systems at the micro-level are numerous and relatively simple (atoms, molecules, single cell organisms etc) and systems at the macro level are fewer but more complex (ecosystems, biomes, galaxies etc). The scientist and philosopher Arthur Koestler (1905-1983) coined the term 'holon' to describe each individual system. Holons are at once *wholes* in their own right but also *parts* of larger wholes or systems. Koestler coined the term 'holarchy' to describe nested structures of holons in the natural world (Koestler,1978, 23-56, 289-311). Biologist Joseph Needham (1900-1995) declared that *"The hierarchy of relations, from the molecular structure of carbon compounds to the equilibrium of species and ecological wholes, will perhaps be the leading idea of the future."* (Koestler,1978, 31) We argue that it should become one of the leading ideas of sustainability theorists and activists.

The Holistic Tradition

Historically, holistic principles have been employed at both ends of the ideological spectrum: conservative, when it is used to justify and maintain the status quo; and radical when it is used to critique and change the status quo[5]. *Conservative holism* sees society itself as an organism and bases its arguments upon a presumed, intrinsic social unity; any single change will affect everything else. Moreover, if society is already a 'unity', there is *no need* for change. For instance, sociologist Talcot Parsons (1912-1979) took as his departure point a supposed social unity or wholeness and argued that the function of society's interdependent parts (the family and the economic, religious, political and educational systems) was to preserve this unit. *Radical holism* argues that our society has become fragmented and uses the metaphor of the unity of the organic to generate norms to which it should aspire. In this case holism is used as a tool for

[2] Gaia theory, developed by scientist James Lovelock proposes that the entire planet is a web of symbiotic/systemic relationships that self-regulate to preserve the conditions conducive to life. See Lovelock, 1991. See Capra, 1996 for more on principles of living systems.

[3] The term social holism describes any social, political or economic philosophy which implicitly or explicitly employs the metaphor of the organism. It has usually been associated with various kinds of collectivism.

[4] A further important principle is that of 'growth and development' but this is beyond the scope of this paper to discuss

[5] This distinction between conservative and radical organicism/holism is based Werner Stark's distinction between positive and normative organicism. He argues that the former seeks to preserve the status quo whilst the latter seeks to change it by deriving norms, or values, from 'the organic'. It should be noted, however, that normative holism is not necessarily progressive or radical. The Nazis, for example, used holism as part of its ideological justification for totalitarianism. See Stark 1962, and Harrington 1996.

critique to establish a contrast between what society *is* and what it *could become*.

Radical holism developed as an anti-authoritarian tradition in the latter half of the nineteenth and the twentieth century whose representatives described themselves as anarchists, libertarians, communalists, socialists and social ecologists[6]. These include scientist/philosopher Peter Kropotkin (1842-1921), biologist/planner Patrick Geddes (1854-1932), philosophers Gustav Landauer (1870-1919), Martin Buber (1878-1965) and Murray Bookchin (1926-2006), historian/regionalist Lewis Mumford (1895-1990) and economist Jane Jacobs (1916-2006). The radical holists argued that society's organic social forms have been *"hollowed out"* (Buber, 1958, 11) which severely compromised the ability of communities to be self-managing and autonomous and they contended new organic social forms were needed to adequately address modernity's many crises.

Social theorist Gustav Landauer defended the organic cohesion of traditional society and argued that coercion in modern society could only be overcome through the reinvention of an organic community that arises out of the multiplicity of small interrelations of daily life. Religious philosopher Martin Buber (1878-1965) contended that industrial capitalism eats away at society's *"cellular tissue"* (Buber, 1958,14), undermining organic communal structures and leaving a vacuum filled by the nation state, which assumed responsibility of community based institutions. Buber proposed the repair of the cellular tissue of society through the creation of an *"organic commonwealth*"(Buber, 1958,136) a confederation of small, autonomous communities.

The historian/regionalist Lewis Mumford (1895-1990) was more explicit in his use of the term 'organic' in the social realm, and used words such as 'associative', 'mutualistic', 'integrated', and 'interdependent' to describe an organic society. Much of his work explored how, in modern times, diverse organic social forms were displaced by a single, centralising and mechanistic entity. He dubbed this entity the megamachine; a form of social organisation in which the processes of daily life had become automated, standardized, and quantified. The parts of the megamachine included the factory (devoted to standardized mass production), the standing army (the first instrument of mass, standardized consumption), and bureaucracies (in which human beings became interchangeable functionaries). Within this model, all society's life support systems; monetary, healthcare, education, and agriculture took on the same mechanistic characteristics (Mumford, Lewis, 1970).

Social ecologist Murray Bookchin (1921-2006) argued that the principle of 'unity in diversity', (as exemplified by natural ecosystems) has radical political and social implications: *"Natural diversity is to be cultivated not only because the more diversified the components that make up an ecosystem, the more stable the ecosystem, but diversity is desirable for its own sake, a value to be cherished as part of a spiritized notion of the living universe"*

He maintained that relationships within ecosystems are complementary rather than hierarchical: *"Virtually all that lives as part of the floral and faunal variety of an ecosystem plays its coequal role in maintaining the balance and integrity of the whole".* Bookchin argued that the ecosystem is so complex it cannot be managed, controlled or reduced to simple *"physico-mechanical properties"* (Bookchin 1980, 59)— its spontaneity must be respected. Using ecological principles as the foundation of his social critique he argued that hierarchy and domination are at the root of our modern crises. He argued that modernity's quest to dominate nature grew out of hierarchical forms of social organization.

The corollary of this critique of hierarchical/inorganic society is that an organic society would be characterised by social spontaneity and an absence of hierarchy. Bookchin cites anthropologists such as Paul Radin (1883-1959) who demonstrated that the latter were characteristics of many pre-literate, tribal societies and referred to them as 'organic'. He declared:

"We are travelling the full circle of history. We are taking up again the problems of a new organic society on a new level of historical and technological development — an organic society

[6] I use the term 'radical holism' to distinguish between those anti-authoritarians who refer to nature to justify their social norms, and those who do not.

in which the splits within society, between society and nature, and within the human psyche that were created by thousands of years of hierarchical development can be healed and transcended" (Bookchin 1980, 252)

Holistic principles and traditional societies

Social holism has been criticized for both its conservative tendencies and inability to adequately define a 'social whole'. Sociologist Scott Gordon complains that social holists have *"an almost limitless array of social entities to choose from"* (Gordon 1991, 657) and they do not account for why the particular social entity or collective they have identified is any more whole than the putative wholes identified by other social holists. Moreover, the wholes identified tended to be abstractions that bear only a tenuous relationship to everyday experience. An illustration of this inability to adequately identify authentic organic social wholes is the idea of the 'nation state' which Scott Gordon referred to as *"the most favoured collective entity"* (Gordon 1991, 658) and yet which embodies none of the holistic principles of self-organization, emergence, holarchic structure and interrelationships; indeed the concept is the opposite in its hierarchical, centralized structure. Sociological literature is replete with references to various types of abstract 'wholes' such as 'the general will of the people' (philosopher Jean-Jaques Rousseau, 1712-1778). This is not to say that such abstractions do not correspond in any way to human experience, but rather that they live as abstract theoretical 'fragments' that are dissociated from it.

A more tangible manifestation of the metaphor of organic 'wholeness' can be found in many sustainable, pre-industrial cultures in which holistic principles found in natural systems underpin everyday life. Emergence, self-organization, interdependence and holarchic structure were characteristics of societies as diverse as the early 20th century Ladakhi in India, the 16th century Hopi of North America and the Renaissance Sienese. It is not our intention to idealize these societies nor discount their shortcomings, rather our investigation attempts to understand what it was about everyday life in these societies that made them sustainable (i.e. they were able to flourish over generations in place and in relative resonance with natural systems).

Some sociologists have argued that such cultures were more organic (whole) than industrial and modern society and make a positive correlation between a society's degree of organic structure and the robustness of its social forms. The sociologist Ferdinand Tonnies (1855-1936) distinguished between pre-industrial societies characterised by 'Gemeinschaft' (tightly integrated, *'organic'*, social groupings based on kinship and face-to-face relationships in small scale communities) and industrial, modern (especially urban) cultures characterised by 'Gessellschaft' (loosely knit social groupings based upon contractual relationships) (Tonnies, 2001)

Sociologist Gerard Delanty notes the preoccupation of *"modern thought from the Enlightenment onwards ... with a sense of the passing of an allegedly organic world*" (Delanty 2003,15*)*, and describes this preoccupation as *"a discourse of loss*" (Delanty 2003, 11*).* For the radical holists this *'discourse of loss'* runs alongside what might be called a *'*discourse of hope*'* in which organic social forms that were lost can and must be recovered incorporating the technological and social advances of the last two hundred years. The problem lies in the failure to progress the organic metaphor in a meaningful way and elucidate what it was that made some pre-industrial cultures more sustainable and whole than our own. My argument is that a closer diagnostic look reveals the way in which holistic principles were embodied in their everyday lives, which in turn can provide us with guidelines for recovering organic structure in our own society.

4. The Satisfaction of Needs in Everyday Life

One of the most striking differences between traditional communities and the modern equaivalent is the fact that the former were relatively autonomous in their ability to satisfy both subsistence and non-material needs within their own boundaries. Development economist

Manfred-Max Neef (1932-) identifies ten needs that human beings have in common, but that are satisfied in ways that are unique to place, culture and era. The viability of a community depends upon how and if these needs are satisfied. These universal needs, according to Max-Neef are: 'subsistence', 'protection', 'participation', 'creativity', 'freedom', 'understanding', 'idleness', 'affection', 'transcendence', 'security' (Max-Neef, 1991, 13-54).

There is room for debate about whether or not Max-Neef has identified the 'right' set of needs and in its full application his method tends toward the formulaic[7]. What is relevant, is that within the traditional cultures discussed, social forms were emergent and arose out of the process of communities satisfying universal needs in place/culture specific ways and that their control over the satisfaction of these needs was directly related to the 'wholeness' or organic structure of their society.

In such communities, most needs—material and otherwise—were satisfied with relatively little recourse to the outside world. Food was locally grown, shelter and other artefacts were usually created from local materials, and energy was derived from available biomass, water or wind. Non-subsistence needs were also satisfied from within the community. For example, a common feature of traditional communities were councils which oversaw the affairs of the village, resolved disputes, coordinated harvests and satisfied the needs for 'freedom' and perhaps 'participation'.

5. Self-Organizing Social Forms

We can now combine the four strands of everyday life, holistic principles, theory of needs and nested networked social form to understand the dynamics of wholeness with respect to social form:

1) Self-Organization: a community is more likely to be self-organizing if it does not depend on external intervention or management for the satisfaction of its needs. Pre-industrial communities were not necessarily perfect self-organizing systems; there have been many social, cultural and economic practices within such communities that meant that some individuals were able to coerce or control others, and in as much as they were internally coercive, pre-industrial communities were imperfectly self-organizing. In *The Ecology of Freedom* (1982), Murray Bookchin argues that it was ultimately the coercive hierarchies that arose *within* organic communities that led to their downfall. Nevertheless, such pre-industrial communities could be said to be self-organizing *in relation to their external environment*.

2. Emergence: in as far as communities were self-organizing, they could be said to be emergent. No external dictates, design, blueprint or management brought them into being, rather, they emerged out of the ongoing process of striving to satisfying their needs.

3. Wholeness: traditional communities could be said to be more 'whole' than their modern counterparts because the relationships of which they were comprised were tight and mutually influencing and grew out of the mutual satisfaction of needs. These relationships did not exist solely between people (which is the focus for most social holists), but extended to include the natural world, the artifacts and structures they created *and* the relationship between the 'built' and natural worlds. Only through acknowledging and understanding the nature of this tight and semi-autonomous web of relationships can we begin to assess and reconstitute wholeness within social form.

4. Holarchic structure: one of the key characteristics of pre-industrial society was their ability to satisfy their needs *at different levels of scale* of everyday life which gave rise to distinct and clearly defined social forms. I have coined the term *Domains of Everyday Life* (Kossoff, 2007) to describe the nested (holarchic), emergent and relatively self-organized webs of relationship

[7] There is a body of work pertaining to human needs, (Illich 1978, Leiss 1978 and Maslow 1999), however only Maslow offers an alternative systematized theory. This is an area that the author would like to see explored by sustainability theorists and activists in order to develop a more flexible and practical system.

between people, their artifacts and nature which came into being as communities strove to satisfy their needs in place-specific ways at different levels of scale. These Domains of Everyday Life have repeatedly arisen throughout history are: the household, the village or neighbourhood, the city (or town) and the region. They provided the context within which everyday life was lived and resemble natural ecosystems in their structure.

Within the Domains of Everyday Life, many needs could be simultaneously satisfied. Max-Neef refers to this as the *integrated* satisfaction of needs which we argue is an important component of social wholeness. For example, a wide range of activities often took place within the domain of the traditional household. Not only did it provide shelter for the family, but was a place where the family's livelihood was generated without dependence upon an external market. Economist Scott Burns notes, that *"A colonial family of 1770, in a settled area such as Connecticut, made its own shelter, provided its own fuel and light, raised its own food, and slaughtered its own animals. It also made most of its own fabric and clothing. Money was scarce because there was little need of it.....such a family produced about 75% of its own* [subsistence] *needs within the household."* (Burns 1975, 73) A further example of the integration of needs might include the repair of the roof of a house as a village event, in which a community's need for shelter, security, affection, participation and creativity would all have been simultaneously satisfied.

At the level of the village, historian Norman Wymer (1911-1982) observed that: *"Every* [English] *village boasted its full complement of blacksmiths, saddlers, thatchers, builders, plumbers, carpenters, joiners, woodmen, wheelwrights, rake-makers, coopers, and tanners. In the cottages, too, the women would be busy spinning and weaving the wool from the sheeps backs, making linen out of flax, or quilting, while their menfolk toiled in the fields or village workshops".*(Wymer 1951, 37)

And historian Ferdinand Braudel writes that before the industrial era:

"90% to 95% of the towns known in the West had fewer than 2,000 inhabitants [ie what we would now be consided a modest sized neighbourhood] *yet normally enjoyed a full range of craftsmen and artisans and merchants and farmers... a typical English town of several thousand as late as 1880 or 1900 would have blacksmiths and shoemakers, plumbers and carpenters, bakers and butchers, brewers and millers, saddlemakers and harnessmakers, tailors and seamstresses, dentists and midwives, a pub and a church and a reading room, an inn and a market and a row of shops"* (Braudel 1973)

However, the Domains of Everyday Life were not given equal emphasis in all pre-industrial cultures. For many cultures certain domains were emphasized over others, and in some cases were completely absent. The homesteading culture, cited previously emphasized the domain of the household, but a hunter-gatherer culture would have emphasized the domain of the region within which they moved and to which they were very highly attuned; the domain of the city would have been non-existent. For the Ancient Greeks, the city ('polis') was the level of everyday life ascribed the highest status, and the role of the household was seen as a place for slaves and women. In the cities of medieval Europe, the household, the neighbourhood and the city were often highly developed social forms in their own right.

Each of the Domains of Everyday Life had its own particular role in the life of the community, and often the same needs were satisfied in different ways at each of these levels of scale. For example, at the level of the household, the need for 'affection' would be satisfied by long term, often biologically based, multigenerational relationships, whilst at the level of the neighbourhood, the same need would be satisfied by more freely chosen friendships. Needs might also be satisfied in different ways in domains at the same level of scale. For example, in a single region one village might satisfy its need for food by a diet based on arable crops, whilst another might satisfy this same need through fishing and small scale horticulture. Although the Domains of Everyday Life could be described as universal/archetypal forms that were common worldwide, throughout history, these archetypes were diversely expressed as an emergent property of people satisfying their needs in ways appropriate to their time, culture and place.

Whilst each domain was semi-autonomous, they were also mutually interdependent; with domains at the same level of scale and also between levels. At the same level of scale, households had relationships with other households, neighbourhoods with neighbourhoods etc. At different levels of scale, households had relationships with the neighbourhood within which they were nested, neighbourhoods with cities, and so on. The Domains of Everyday Life were not only self-organising and emergent wholes, but what Koestler called holons, or whole/parts (Koestler 1978, 27).

Each domain represented a different level of community, and each level of community had its own qualities and possibilities. Moving from inner domains to outer domains, from the household through to the region, relationships between people, their artefacts and nature become progressively less intimate and more transient, but more multiple and diverse. The pre-industrial domain of the household could be seen as a small, tightly bound 'community' based on relatively few, long-term relationships; the domain of the neighbourhood was a larger, less tightly bound community, but had more variegated relationships, and so on, moving out through the domains. It is this shift from 'thick' to 'thin' and *few to many* relationships that gave the domains their respective roles in the overall organisation of pre-industrial communities. For example, the domains of the household, neighbourhood and village were levels of everyday life better suited to the creation of livelihoods than the domain of the city, which provided a market that enabled neighbourhoods, villages and households to trade. The domain of the city or region was more likely to support universities, hospitals and other cultural institutions than the inner domains.

My argument is that the degree of sustainability realized by these types of pre-industrial communities was directly related to the robustness (wholeness) of the domains of everyday life which can be seen as the skeletal structure of society. One can also speculate that the ability of such communities to endure over long periods of time was due to their ability to retain control over the satisfaction of their needs.

6. The Fall and Rise of The Domains of Everyday Life

Even a cursory analysis of modern society reveals that it is not organized according to the previously discussed holistic principles. The Domains of Everyday Life are still present — we still have 'households', 'villages, 'neighbourhoods', 'cities' and 'regions'— but, to use Buber's phrase, they have become 'hollowed out'. Instead of functioning as semi-autonomous and robust wholes that integrate the satisfaction of needs in everyday life, today the domains are little more than fragments within externally controlled, unsustainable globalized systems. The inhabitants have little control over these globalized systems, yet are completely dependent upon them and have therefore lost control over the satisfaction of their needs. Max-Neef argues that control of the satisfaction of human needs by dominant minorities has been one of the hallmarks of civilization that has undermined communities, resulting in Buber's 'hollowing out' or loss of organic structure. In modern society this control has become extreme.

Satisfaction of needs has been almost entirely appropriated in modern society by centralized entities such as the nation-state and market economy. Radical holists and others have argued that this process of dismantling self-organizing, emergent communities has been an aggressive policy pursued by nation states. In his book *Mutual Aid* (1902), Kropotkin laments that in Europe nation-states

"weeded out...folkmotes...courts and independent administration....lands were confiscated...guilds spoliated of their possessions....cities divested of their sovereignty...the elected justices and administration, the sovereign parish and parish guilds...were annihilated: the state's functionary of every link of what formerly was an organic whole [absorbing] *all it social functions...*[it saw] *in the communal lands a means for gratifying its supporters..they* [the nation-states] *have broken all bonds between men."*(Kropotkin 1987, 182-199)

Lewis Mumford argued that the ‘Megamachine’, described above, was designed to establish *“predictable behaviour and remote control from the centre* [by transferring] *autonomy from each individual member and group in the community to the organized whole in which they would function only as obedient machine-like parts*.” (Mumford 1970,100) Local and community based social forms (including what I have referred to the Domains of Everyday Life) were replaced with centrally conceived, managed and directed institutions such as factories, the military, police, judiciary, joint-stock companies, schools, and hospitals.

The result of this centuries-long process many needs can now only be inadequately satisfied by recourse to distant and often unaccountable institutions. The result is that for most people on the planet, subsistence needs can now only be met by engaging in the globalized market, which is centrally controlled by a handful of corporations. Non-material needs such as ‘understanding’, ‘participation’,‘freedom’ and ‘security’ have suffered a similar fate as the political process, education, leisure, healthcare and so on have been appropriated by both the market and the nation-state.

As the process of satisfying needs is ceded from the Domains of Everyday Life to institutions external to them, the domains are transformed into fragments of these large, centrally controlled systems, and so lose their vitality and go into decline. The consequences are varied and global in scope and include, the impoverishment of domestic life, the decline of villages, the disappearance of distinctive neighbourhoods within cities, formless and ecologically damaging urban sprawl which eats into the surrounding countryside, the loss of regional culture and identity, and the ruination of landscapes. In other words, as the Domains of Everyday Life go into decline, so society becomes ecologically, socially and culturally unsustainable.

An important step in the transition to a sustainable society will be the reconstitution of the Domains of Everyday Life which will require their inhabitants to regain control over the satisfaction of needs. Such a revival of organic form would see households, villages, neighbourhoods, cities and regions reconstituted as sustainable, semi-autonomous but interdependent social forms that can become the context for healing what Murray Bookchin called *“the splits within society, between society and nature, and within the human psyche*”. (Bookchin 1980, 252)

Because different communities satisfy their needs in different ways that are specific to culture and place, the reclaimed domains would be diverse and varied in their expression. This decentralising process would eventually lead to the demise of institutions that currently preside over communities, and upon which communities are dependent. To the list of traditional domains that must be reclaimed we can now add ‘The Planet’ as a domain within which our everyday lives are lived and within many needs can be satisfied. Living sustainably in the domain of the planet will endow everyday life in a holistic society with a diversity and cosmopolitanism that traditional societies lacked.

6. The Reconstitution of The Domains of Everyday Life

In the sense that this approach creates a tension between what ‘is’ and what ‘ought to be’, it is utopian, however a more accurate description might be ‘ecotopian’, due to its advocacy of a society based upon ecological or holistic principles. A visualization or future-casting process is needed to generate clarity about what in contemporary society needs to be changed, and provide a guidelines for change. My intention is to provide a methodology to enable practitioners and activists to more appropriately critique and assess existing conditions, and to conceive and design solutions to bring coherence to the multitude of sustainability initiatives being conceived in a more or less piecemeal fashion worldwide. It is conceived as a way of creating a symbiotic relationship between theory and practice, and transforming everyday life from what Guy Debord called *“a domain of igorance”* into a domain of knowledge and grassroots activism.

Through the lens of this framework one can examine a particular domain and analyze how the needs that arise within it are being satisfied (or not) and design ways in which they could be satisfied more appropriately/sustainably. One can ask how the broken strands of interelationship between people, their artefacts and nature can be rewoven.

One of the most significant barriers to the reconstitution of the Domains Everyday Life is the fact that the issues pertaining to it do not correspond to either the academic disciplines nor professional areas of specialty. The problems of everyday life are, what Horst Rittel referred to as 'wicked problems' (Buchanan 1995, 12-18) and are characterized by incomplete, contradictory and changing requirements whose solutions are difficult to either recognize or achieve because of their complex interdependencies. The solution to one aspect of a wicked problem often reveals or creates others. Such problems cannot be neatly parceled up and handed over to sociologists, ecologists, economists, geographers, architects, engineers, psychologists, or even designers and will call for a reconsideration of both educational systems and the ways in which professional specialties are applied. Reconstituting the Domains of Everyday Life requires transdisciplinary collaboration between educators and practitioners in all disciplines. Since each domain is the creation of a community of people *living in place*, specialists must work as facilitators of a community-led process to recover control of the satisfaction of needs. Design, as the realm within which many disciplines converge and are applied is uniquely positioned to lead this ongoing process of the reconstitution of the Domains of Everyday Life. This would constitute a new kind of planning in which communities are redesigned from within.

The cultural theorist Mikhael Bakhtin (1895-1975) (Gardiner 2000, 20) argued that we need to seek out *"the shoots and buds of potentiality "* in everyday life. The framework proposed in this paper can help us identify and nurture these shoots and buds; myriad sustainability initiatives which are currently underway or as yet are only ideas. When enough of these are networked together at different levels of scale, they will form complex 'ecosystems of potentiality' in everyday life. If this potential is realized, the Domains of Everyday Life will begin to flourish and we will witness the rebirth of households, neighbourhoods, villages, cities, regions and the planet itself as self-organizing, emergent, and networked wholes. This rebirth is an essential part of the transition to a sustainable society.

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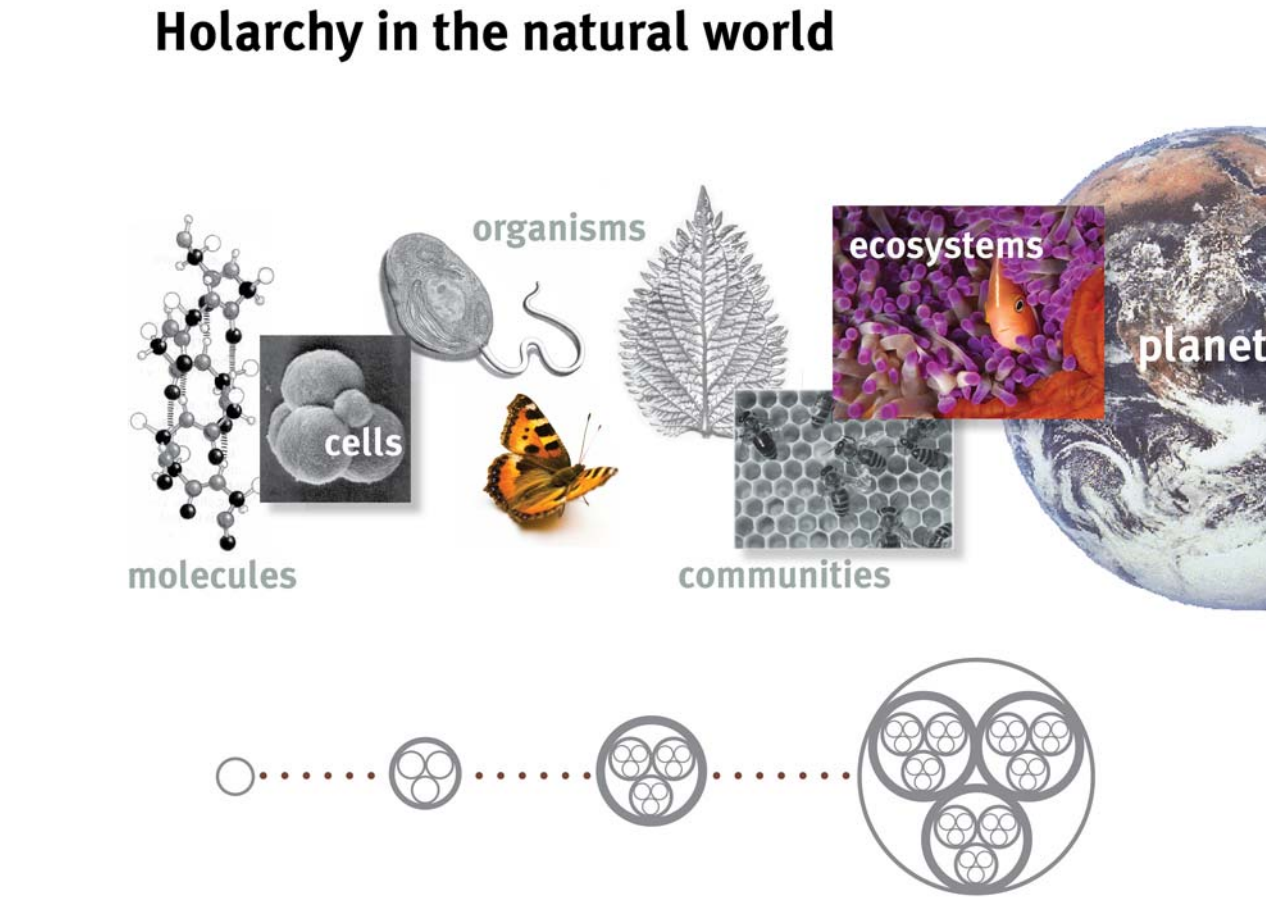

Fig. 1: structure in nature is comprised of 'holons', parts that are both semi-autonomous wholes, but also parts of larger wholes or systems. This organic structure is nested, networked and interdependent and is a characteristic of pre-industrial sustainable communities.

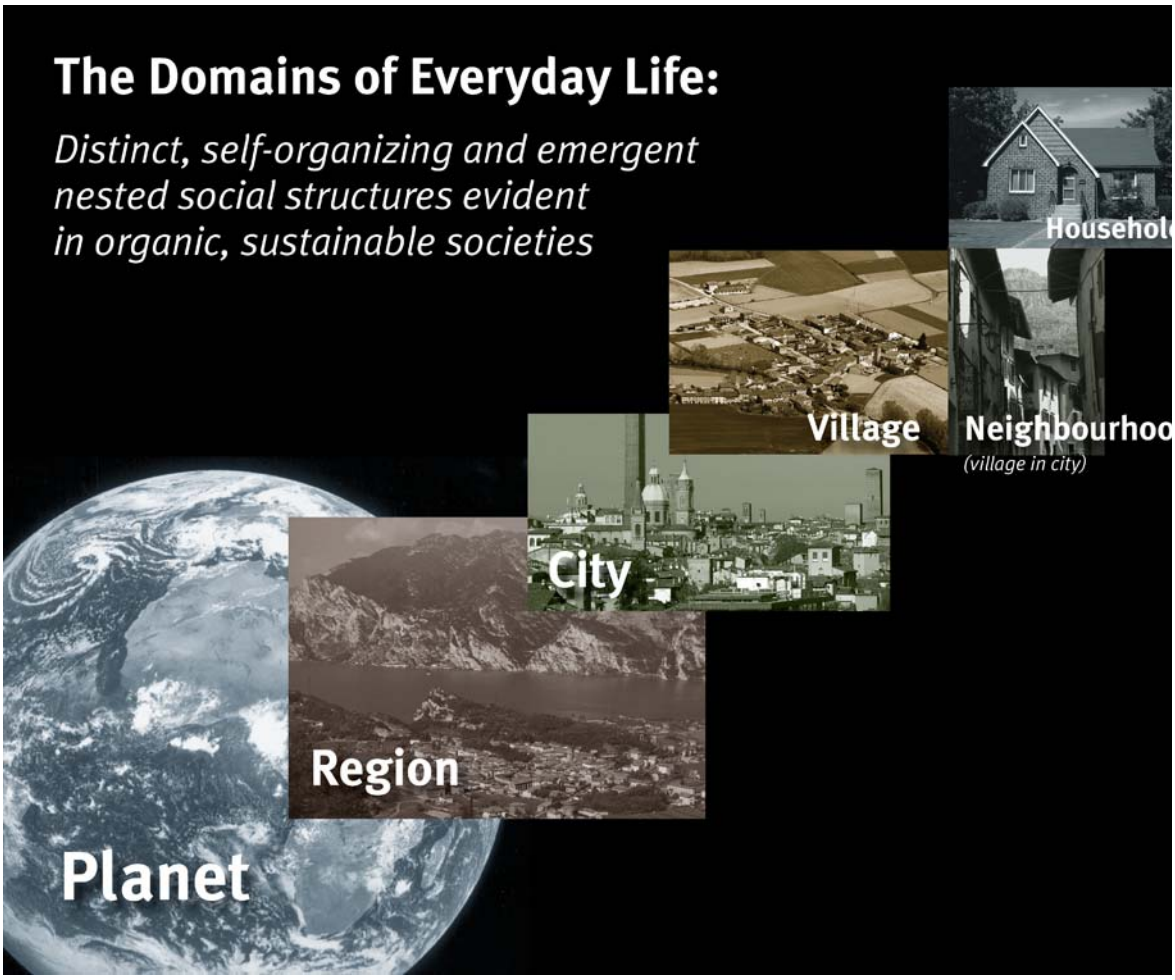

Fig. 1: within traditional, sustainable societies, similar archetypal, distinct nested social forms have emerged throughout history, across a wide variety of cultures. These 'Domains of Everyday Life' are: the household, the village/neighbourhood, the city, the region, and—in the modern era—the planet.

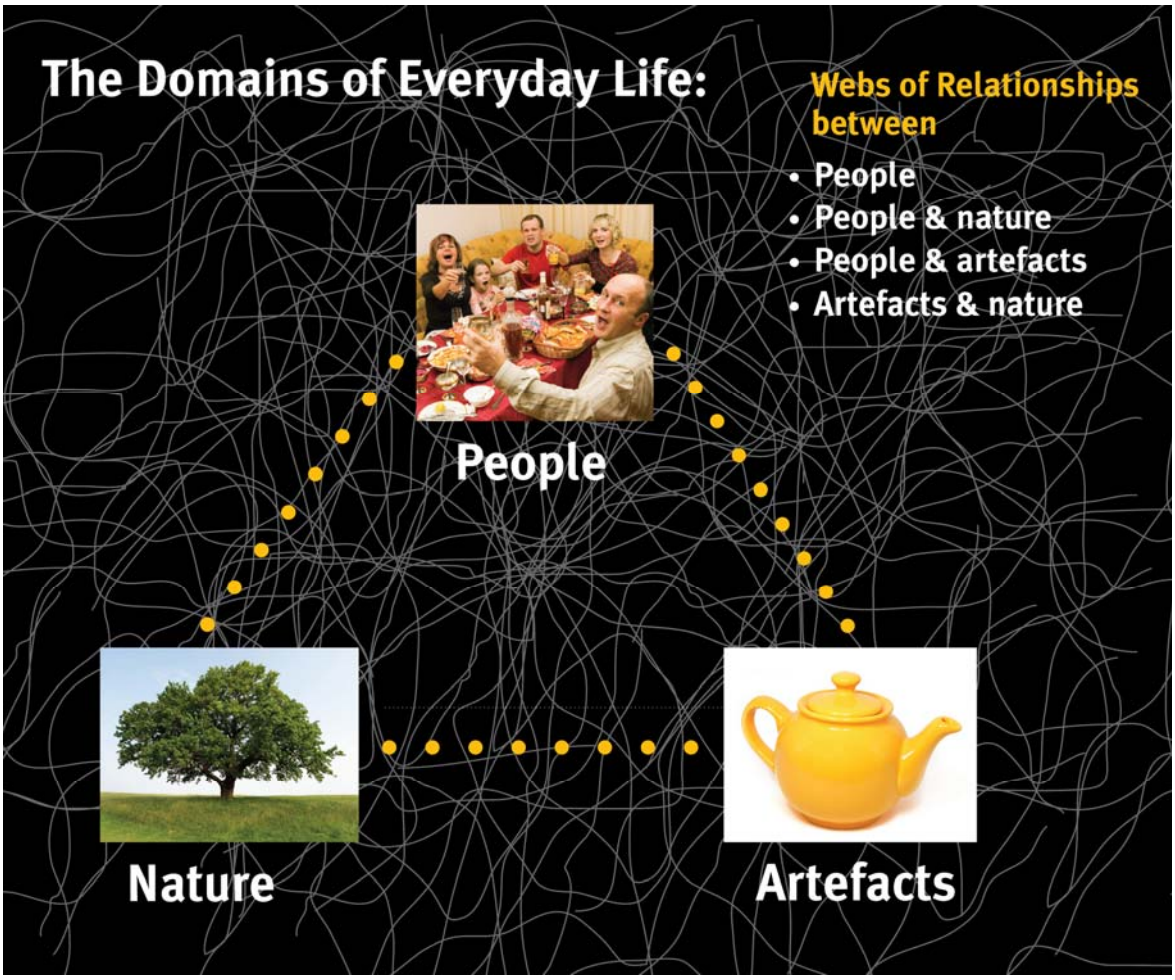

Fig. 1: the Domains of Everyday Life can be seen as nested ‘webs of relationship’ that exist between people, the artifacts they create and the natural world.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Designing innovative forms of intermediation and communication

Towards sustainable production and consumption systems

Lia Krucken[1]

Abstract

The aim of this paper is to bring to light novel forms of intermediation and communication between producers, consumers and organizations that support sustainable solutions for production and consumption. In order to illustrate how producers and consumers combine to meet the challenge of developing sustainable solutions for intermediation and communication, some examples from Brazil and Italy are presented, with a particular focus on biodiversity products.

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1. Introduction

The aim of this paper is to bring to light novel forms of intermediation and communication between producers, consumers and organizations that support sustainable solutions for production and consumption. In order to illustrate how producers and consumers combine to meet the challenge of developing sustainable solutions for intermediation and communication, some examples from Brazil and Italy are presented, with a special focus on biodiversity products.

2. Design in contemporary contexts

The designer takes on the clear role of facilitator of collective innovations and systemic solutions. The main design support actions identified can be grouped as follows:

- **Promoting vision and systemic innovation**: visualization of "the production and consumption system"; enabling innovative forms of intermediation and interaction among players; conception of scenarios and solutions for the future; development of transversal relations between people, organizations and values;
- **Supporting value creation for local qualities and resources**: recognition and communication of local identifying features and qualities; design of products and services strongly linked to the territory of origin; value creation and protection of "territory + community + resources" complex;
- **Fostering sustainable ways of production and consumption:** promotion of producer and consumer awareness about environmental, cultural, economic and social values embedded in products and services; promotion of new aesthetical values and ways of product quality perception; supporting the inclusion of the consumer invalue creation, as part of the solution, together with producers and stakeholders.

It is to be noted that the scope of design is being progressively enlarged and oriented towards a systemic perspective, which includes the projection and the planning of sustainable products and services systems. Hence, innovative tools and guidelines to support the design action are needed. Important advances in these means have been highlighted in the last decade (Manzini, 2006; Thackara, 2005; Manzini, Jegou and Meroni, 2004; Margolin, 2000; Castells, 1999), and will be examined in this paper.

Indeed, designers face a complex set of tasks, as outlined by the International Council of Societies of Industrial Design (ICSID, 2005): "*Design seeks to discover and assess structural, organizational, functional, expressive and economic relationships, with the task of: Enhancing global sustainability and environmental protection (global ethics); Giving benefits and freedom to the entire human community, individual and collective Final users, producers and market protagonists (social ethics); Supporting cultural diversity despite the globalisation of the world (cultural ethics); Giving products, services and systems, those forms that are expressive of (semiology) and coherent with (aesthetics) their proper complexity.".*

3. Creating value for products and territories

The relationship between local resources and productive communities has been explored by the LEADER European Observatory for Rural Development. It introduced the concept of "territorial capital" as "elements set available in the material and immaterial level which can

constitute, in some aspects, advantages and in others, disadvantages" (LEADER, 1999, p.19). It is important to consider the dynamic character of territorial capital: it can only be evaluated according to the history (its past) and recognition of past elements, and its specificities can support the construction of a strategy (future), in other words, "the territory project". Moreover, there are relations that are global (external networks, exchange with markets and institutions) and those that are local (local networks, interaction between actors and institutions from the territory) which are involved with the territory and are fundamental in the "territorial capital" analysis.

In this sense, territorial capital leads to what is considered as local wealth (activities, landscape, patrimony, traditional knowledge, etc), aimed at promoting territorial competitiveness.

The notion of territorial competitiveness is corroborated by Cristallo (2003), who introduces the idea of the "environment-company" or a decentralized company, i.e., the territory is seen as a "productive habitat". The term "productive habitat" refers to an articulated and complex system of productive activities located in a certain territory, within an environment in which all that is produced is narrowly linked to the binomial context-identity. In many cases the local company is determined by an informal economy that promotes the establishment and equilibrium of relations between territorial, human, physical, economic and intangible resources.

The hypothesis sustained in this work is that the design perspective can contribute to making society aware of the origin, history and values embedded in products. Design can help to establish the world and strategic vision of user-oriented offers, making more explicit the myriad of parameters to be considered in planning value systems. Besides, design can get closer to both sides of the production cycle through oriented communication: the raw material producers and the final consumer. Designers play a clear role as opinion leaders and can provide direction for developing more sustainable values.

4. Critical questions faced by designers

In conventional value chains we can observe several levels of activities that arise from the distance between the producers and consumers (Fig. 1). In this simplified scheme we can identify raw material producers, transformers, distributors and final users. In complex chains, involving a great number of actors, consumers are not always are able to identify the producers of raw materials. That is to say, proximity and traceability may be lost.

This framework can be useful in order to identify at which points design interventions occur (or could occur) and how value (of products and services) is created or enhanced to develop new forms of intermediation and communication. Therefore, designers face various questions, which will be discussed in this paper.

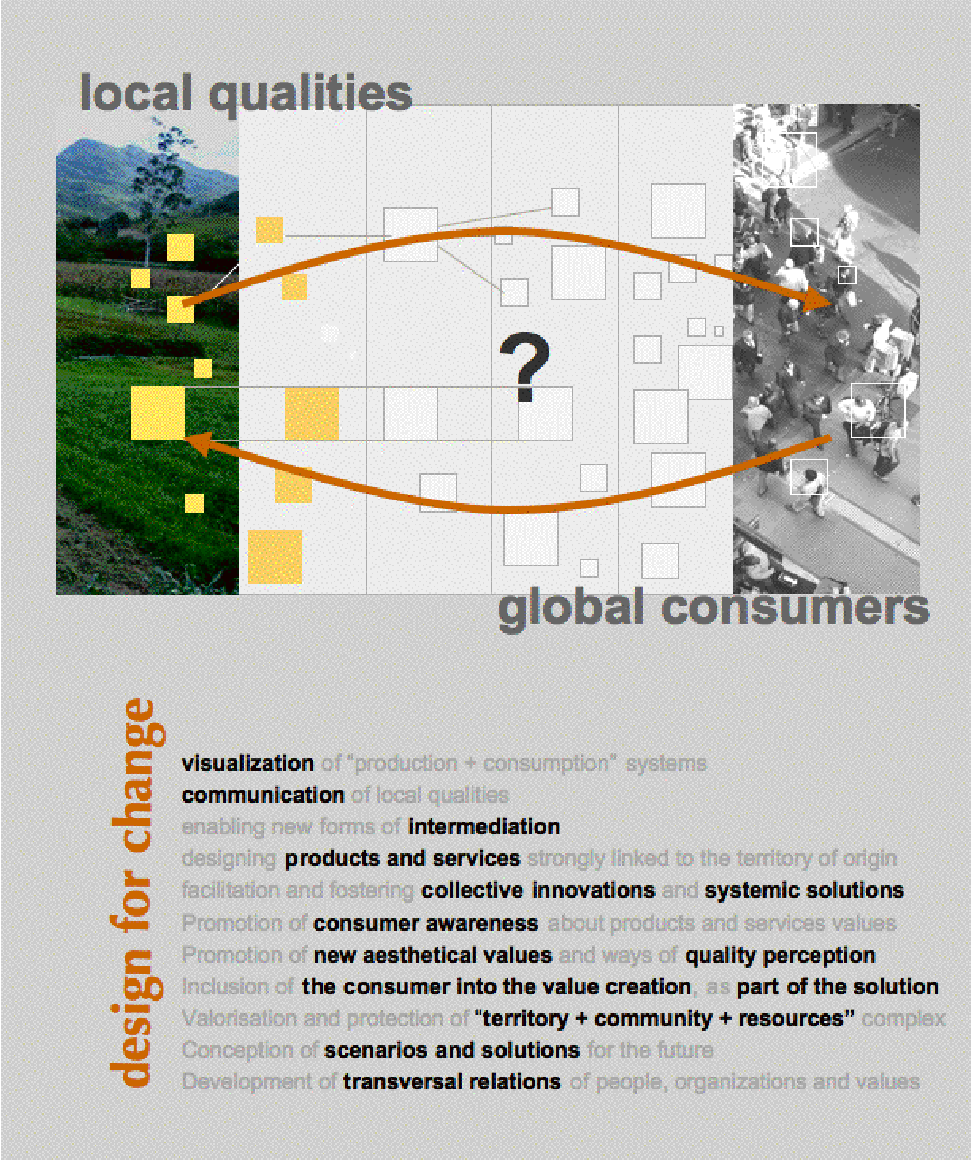


Fig. 1. Design contributions in the producer and consumer system.

Question 1 - How can product values and local qualities be communicated to global consumers?

There are two important pieces of evidence used by the consumer to infer product quality (*i.e.* perceived quality): traceability and authenticity. Both are becoming more important due to the proliferation of numerous, indistinguishable products on the market.

In general terms, traceability[2,3] is related to the technical quality of the product. However, overall quality encompasses cultural and social aspects that are much more difficult to trace in a global market. Therefore, it is important to consider a wide view of traceability, in which ethical and moral values of producing, distributing and consuming food products are taken into account.

[2] Traceability is defined as the "ability to trace the history, application, or location of that which is under consideration", according to the International Organization for Standardization (ISO 9001:2000).

[3] Food traceability means "the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into food or feed, through all stages of production, processing and distribution", according to Council Regulation (EC) No 178/2002.

Strategies to foster transparent and truthful relationships between producer and consumer include: a) green certification - such as biological agriculture (BIO), ecological and organic products; b) product origin and quality identification - as D.O.C. and Label Rouge; c) fair trade certification and “transparent price” charts – that can be seen in Illustration 1 and Figures 2 and 3 – and other informative labels.

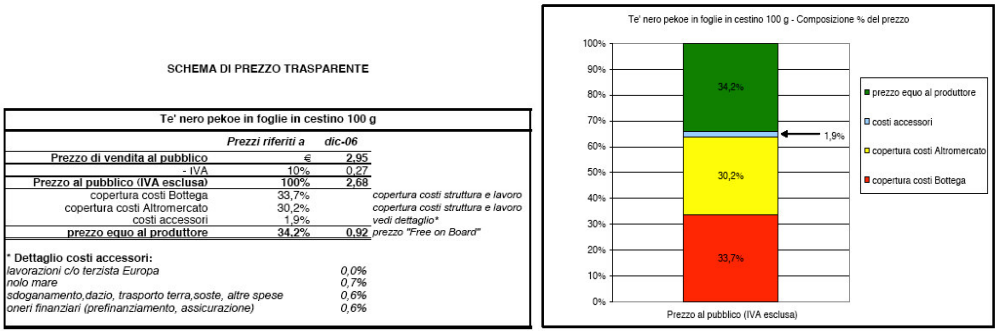
These “indicators” can provide some information about production processes and their social and environmental sustainability, product quality and origin, the cultural and historic elements embedded in the products and their production processes. If communicated in an effective and actual way, this visibility improves the awareness that each product is a project, resulting from a relationship between people who produce and consume

Illustration 1 – Transparent price label: an Italian initiative

The ‘transparent price’ can be understood as a tool to allow the consumer to know exactly that part of the final price related to producers, distributors, commercial organizations, etc. It is composed of: a) value paid to raw-material producers; b) transportation related costs; c) commercial fees and taxes, import and export duties; d) transformation related costs; e) distribution related costs; f) products certification (such as biological products); g) market launch related costs.

A transparent price can encourage companies to build long-term relationships with a valued client base. This strategy is used by Ctm Altromercato, Italy’s largest alternative trading organization. Originally founded in 1988 in Bolzano (Italy), the organization became a consortium of world shops called Ctm Altromercato in 1998. It now includes more than 118 organizations (associations and cooperatives) that are responsible for the management of 230 world shops throughout Italy.

Fig. 2. Example of a transparent price scheme, adopted for Natyr’s products. Source: Altromercato, 2008.



SCHEMA DI PREZZO TRASPARENTE

Te' nero pekoe in foglie in cestino 100 g			
	Prezzi riferiti a	*dic-06*	
Prezzo di vendita al pubblico	€	2,95	
- IVA	10%	0,27	
Prezzo al pubblico (IVA esclusa)	100%	2,68	
copertura costi Bottega	33,7%		*copertura costi struttura e lavoro*
copertura costi Altromercato	30,2%		*copertura costi struttura e lavoro*
costi accessori	1,9%		*vedi dettaglio**
prezzo equo al produttore	34,2%	0,92	*prezzo "Free on Board"*
* Dettaglio costi accessori:			
lavorazioni c/o terzista Europa		*0,0%*	
nolo mare		*0,7%*	
sdoganamento,dazio, trasporto terra,soste, altre spese		*0,6%*	
oneri finanziari (prefinanziamento, assicurazione)		*0,6%*	

Fig. 3. Example of a transparent price scheme, adopted for Altromercato's products. Source: Altromercato, 2008.

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Illustration 2 – Environmental table: a Brazilian initiative of the Natura cosmetics company

The environmental table is similar to the nutritional facts on food packages (Fig.4). Its goal is to provide information on the origin and impact of the ingredients used in products and packaging. The information ranges from raw materials to the disposal of packaging in the environment.

The goal of the environmental table is to stimulate consumers' awareness in relation to the impact of their choices on the environment, society and themselves.

explaining the environmental table	
product	
renewable plant origin	53,5%
natural plant	42,2%
raw material with certication of origin	0%
package	
recycled material	25%
recycled material	86,7%
recommended number of refills	3

*percentuals calculated in dry base

informações ambientais/informaciones ambientales*		
produto producto	origem vegetal renovável origen vegetal renovable	88,3%
	vegetal natural vegetal natural	0%
	com certificação de origem con certificación de origen	88,0%
embalagem embalaje	material reciclado material reciclado	5,5%
	material recidável material reciclable	12,4%
	número recomendado de refilagens número recomendado de recambios	0

*porcentagens calculadas em base seca
*porcentajens calculadas en base seca

Fig. 4. Environmental table adopted for Natura cosmetic products. Source: Natura, 2008.

To promote "visibility" of products and services, it is important to understand the way in which the consumer perceives the product quality. The assessment of the product or service quality is conditioned by several aspects, which are represented in the "value star" (Fig. 5).

- **functional or utilitarian value** is measured by objective attributes related to the product´s intrinsic qualities. It involves the product´s compliance with technical or commercial hygienic regulations (related to the raw-materials used in product formulation, production processes, additional ingredients and safety of packaging), its ergonomics, performance and ease of use
- **emotional value** refers to affective motivations related to sensorial experiences when using a product (the senses of sight, smell, taste, touch and hearing) and the pleasure sensations of buying and consuming specific products. It includes a memory dimension (remembering past positive or negative experiences).

- **aesthetic value** is deeply influenced by the social cultural context (and thus related to place and period) and contemporary phenomena that establish the conditions of interpretation and valuation of a product. It is related to “the spirit of the time”[4].
- **ethical value** is related to social, environmental and economic sustainability of the product production, commercialization and consumption processes. To make the consumer aware of sustainable practices adopted in a product fabrication is also crucial.
- **cultural and symbolical value** is linked to product importance in production and consumption contexts, to the traditions, rituals, myths and spiritual meanings concerning certain products, to its historic and cultural roots and to the sense of belonging that the product evokes.
- **economic value** is assessed by the cost / benefit relationship.

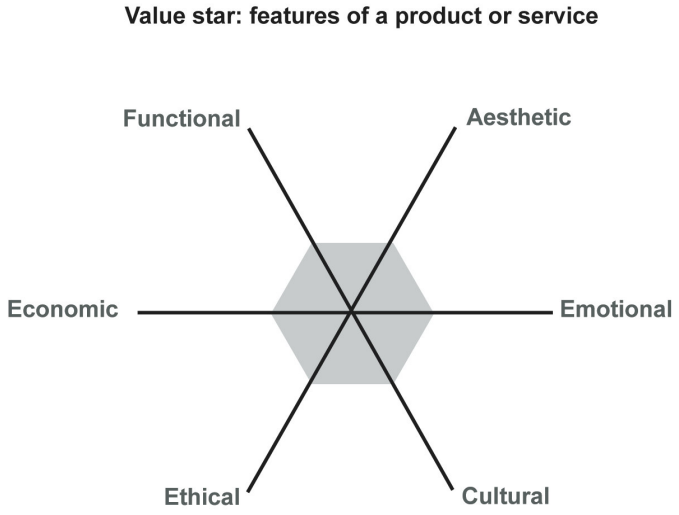

Fig. 5. The value star: features of a product or service.

The overall quality and value assessment of a product will result from the combination of all these six interrelated dimensions of value.

[4] Zeitgeist is originally a German expression that means "the spirit (Geist) of the time (Zeit)". It denotes the intellectual and cultural climate of an era. Zeitgeist. (2006, December 2). In Wikipedia, The Free Encyclopedia. Retrieved 16:53, December 15, 2006, from http://en.wikipedia.org/w/index.php?title=Zeitgeist&oldid=91562645

Question 2 - What kind of relations and solutions can be created to bring producers and consumers closer?

It is not enough to have quality products, nor is it enough to simply identify the market for these products. It is necessary to invest in the development of an integrated vision, articulating all the links that constitute the networks from producers to consumers and that exist between the two, be these nets formed by similarity (cooperation among participants that develop the same activity or possess the same profile, e.g. group of producers of the same product) or by complementarity (cooperation among participants that are complementary, e.g. group composed of consumers and producers).

Some successful experiences based on regional products are related to the support and promotion of:

- integration of small producers, in order to develop agrotourism related services and to organize campaigns for the promoting the value of local heritage and sights;
- organization of supply and purchase groups;
- agreements between producers and government for the supply of organic products for school meals, as it occurs in the "Projeto Sabor Saber" ("Flavour and Knowledge Project" – described in Illustration 3) in Brazil.

These initiatives widely demonstrate that the search for integrated solutions and networks' planning is crucial in promoting the value of local products and socio-environmentally responsible relationships.

Ilustration 3 - Flavor and Knowledge Project - Organic lunches in Brazilian schools

The "Flavor and Knowledge Project", part of the Brazilian Government's Student Food Program, involves schools and small producers, supported by governmental and non-governmental organizations in Santa Catarina State, Brazil. This project seeks to promote the introduction of organic food and knowledge acquisition by the student community of healthy consumption, fostering good eating habits and making them aware of the necessity of environmental preservation and the value of traditional production practices. (Source: Instituto de Planejamento e Economia Agrícola de Santa Catarina (2004), Santa Catarina State Government (2006)).

Contact between producers and consumers is fundamental for the exchange of information on habits and local cultures, stimulating conscientious and sustainable consumption. It is necessary to educate the consumer to recognize and value the diversity of local flavors, promoting the consumption of products adapted to local biomes and to the seasons of the year. In this light, the development of interfaces able to bridge the gap between producers and consumers is crucial.

The Slow Food Foundation for Biodiversity[5] initiative illustrates ways to organize and fund projects that protect our world's heritage of agricultural biodiversity and gastronomic traditions. Other initiatives, related to the development of horizontalities based on small local productions, are mentioned by Manzini (2005), Manzini, Meroni and Krucken (2006), Manzini and Meroni (2006), Krucken (2005).

[5] It was created by the Slow Food movement in partnership with the Region of Tuscany, recognizing that the appreciation of gastronomy must include the additional step of safeguarding our gastronomic resources. While the Slow Food Foundation for Biodiversity promotes projects around the world, its direct financial contributions are especially dedicated to the world's less developed countries, where conserving biodiversity means not only improving quality of life, but actually saving lives, communities and cultures. Source: Slow Food Foundation for Biodiversity (2004)

Question 3 - How to promote sustainable production and consumption systems?

The development of networks based on local resources is a complex activity. It is crucial to develop infrastructures and to plan for long term actions, which will direct the participants who compose the network.

On the basis of an analysis of some experiences, we can highlight some essential elements for the development of networks based on biodiversity resources:

- the quality and authenticity of the local produce, resulting from the sustainable use of resources, the culture and production processes ;
- the intention to commercialize the products is shared by the local community;
- management competences and propensity to collaboration and creation of networks (organized groups of producers, organized groups of consumers);
- competencies for the design and development of integrated platforms that bring together producers and consumers (strategic design of services);
- competencies to sustain the efficient communication of developed products and services, so that the consumer becomes aware of its environmental, social and cultural qualities;
- potential interest or acceptance of the products by consumers;
- technical, environmental and economic feasibility of the proposed solutions in the short, medium and long term;
- infrastructure for the distribution and commercialisation of the products and also for the interaction and coordination between the network's participants (access to information and communications technology , development of a user -friendly interface for communication, etc);
- support structures to further the development of relationships between producers and consumers (trade shows, events, etc).

These elements are dependant on several action levels, starting with individuals (producers, consumers), going through associative organizations, to government and trade organizations (that can contribute to the development of the physical infrastructure for the distribution of products (the logistics) and to the sponsorship of promotional events, amongst other actions).

Another fundamental aspect to be considered is related to the possible impact of the community's economic dynamization and of the new relationships that will be established. A plan for the commercialization of local resources should be based on clear objectives and strategies and shared by the community it affects.

It is especially in the planning and development of this network of participants and of quality relationships that Design can contribute.

5. Final considerations

An increasing awareness of territory and knowledge values that are embedded in products is to be noted. In this sense, properly oriented communication strategies are crucial in stimulating and maintaining an intense information flow between producers and consumers.

Planning and promoting communication are some of the more evident roles played by a designer aiming to promote local development. The key aspects to be considered in the

promotion of local produce are: transparency and traceability, history and meaning (reason for the product, consumption situation and context).

Thus, design actions are connected to the recognition and expression of identifying features and the promotion of a united culture to protect local resources as part of territorial identity. Design can be considered as a means of expressing local values and, in this way, can contribute to the promotion of value and conservation of biodiversity resources. It can also plan the development of innovative products and services related to the original resource, considering a systemic view of the region of origin (as emphasized in the notions of "territorial capital"). In consequence, it can contribute to the economic and social wealth of local communities, integrating many sectors, such as tourism, hotels and catering.

Acknowledgement

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Notes on ecodesign, body and the post-human thought

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Abstract

The paper identifies some features of post-human thought based on recent contributions and connects them – firstly – to design perspectives that are able to affect the relations between objects, the body and the environment, and consequently to possible directions for research into eco-sustainable design.

Through a confrontation with post-human notion of the body, design can conjure up new mixtures and integrations of functions, new connections between body and technology, proposing renewed aesthetic conceptions, opening the door to the imagination of *new models of existence*.

Old ergonomic mechanics is accordingly laid to rest, replaced by a minute observation, free from preconceptions, of diverse and potential inter-reactions between man and objects.

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1. Foreword

The vast debate on the relationship between products and environment is currently developing in various directions: far-reaching theoretical and sociological reflections; analysis of design and technology in relation to life cycle issues; and in-depth research on the possibilities of eco-design.

But what broad prospects for change may arise through the discipline of design? If we are going to usher in a more advanced phase for the disciplines of design, we need to discard the idea of eco-design as merely a “first-aid kit” at the sick bed of production.

In place of this approach, the paper proposes the establishment of eco-design as a key discipline in the pursuit of new viewpoints and substantially different scenarios for the world of objects. *Great design energy, based on solid scientific assumptions but at the same time visionary in outlook* – this is the role that design can play in a more mature phase of ecological culture; it is only via this approach that design can mark a significant turning point in the methods of production of objects.

Why design should be in a position to *change the change* is fundamental the capability of design to *define its own disciplinary field*, starting from the role which is has historically had in the area of Modern Movement; the capability to renew itself and *continually rewrite itself* in order to decisively propose *its own point of view.*.

2. Eco-design, objects and the body

In the complex reflection on the outlook for the world of objects, which the culture of design is specifically required to carry out – entailing the contribution and combination of many disciplines – we can identify one element which is notable by its absence: *the body*. The acknowledgement of eco-design, as a way of more generally rethinking the world of objects vis-a-vis the environment, also interferes with broad sociological considerations; but in this context what is lacking is reflection on the body starting, for example, from the theoretical input of “post-human” thought.

And yet the theories of the post-human certainly impact on *new models of existence* -as suggested by the subtitle of the recent essay by Roberto Marchesini - which influence the culture of design (Marchesini 2002).

The “system of the objects” has changed today in relation to the prospects for modern design, and very radically compared to Jean Baudrillard’s sociological analysis of the 1968s; the relationship between people and objects has been transformed by technological evolution, by a changed conception of the body, and by the *imaginary* linked to the body.

We can identify three transformations that are crucial for the definition of the passage from modern design to post-modern design and which impact in particular on eco-design issues:

1) mechanical technology	electronic technology
2) unit of design: the product	unit of design: the product-in-its-environment
3) society based on objects	dematerialisation and miniaturization

But what terms should we use to define the transition from modernity to the post-modernity of the relationship between the body and the design project? At an initial approximation we can note two aspects: the only way that the body is considered within architectural functionalism in is in terms of an organic, rational machine, starting from the logical equation that nature is completely rational.; the only way that the body is considered within sustainable design is in terms of health,

starting from the logical equation that a healthy environment also means a healthy body. Both these conceptions, apparently distant one from the other, see the body as a pure entity, pure functionality/pure nature.

Post-humanism does not consider technology as something foreign to man and it rejects the customary dichotomous models upon which traditional western philosophy is founded: nature/culture, mind/body, material/immaterial. The post-human concept denies the autarchic nature of the human and anthropocentrism culture: no culture may be considered pure, neither in comparison to other cultures nor in comparisons with “others”- be it in the machine or animal world- in its own self same definition. (Pireddu 2006, 25)

In the 90’s the post-human movement declared the hybrid character in the subject-technology relationship and brought to light an aesthetics of the body invaded by technology. In this way the myth of *an original biological purity of man* fell once and for all, a myth which had been at the base of the beliefs of many modern-day ecologists until quite recently. (Marchesini 2002, 263-4)

In this sense, environmentalism is at the centre of post-human thought, but it must clearly acknowledge cultural processes as “hybridative” events between man, technology and nature.

The body is not a natural fact, a fixed and foundational base idea of old ergonomics, but rather something that has to be *continually invented*, as Michel Serres observes below:

"La bête a un corps réel. Nous avons un corps potentiel, virtuel, capable de toutes les métamorphoses. Une vache n'a jamais fait autre chose que brouter et ruminer. L'homme, lui, réalise toujours des prouesses nouvelles... Son corps varie à l'infini. En cela aussi, il prime sur l'esprit. Le corps invente, la tête aime à répéter. On mécanise bien l'esprit (l'informatique calcule, mémorise, décide même à notre place), mais pas le corps : la robotique ne sait toujours pas remplacer l'homme dans ses gestes quotidiens" (Serres 2000).

The fact that the body is currently removed from the reflection on design is confirmed by the fundamental *impasse* of a specific historical design discipline, namely ergonomics: if ergonomics has become bogged down with the concept of an *abstract and rigid* individual, eco-design now possesses the means to build immediately and plainly a new concrete brand of ergonomics based around a *flexible and hybrid* individual whose existence is implied just as forcefully in nature as it is in technology.

3. From traditional to new ergonomics

As Alessandro Mendini wrote, if I sit on the ground I am a chair, if I sing I am a musical instrument, if I walk I am a means of transport. The body is therefore a primary collection of objects available to man. Primates and Nomads condense down into themselves their own instruments which coincide with their own abodes. Starting from this complete identification, adjusting the relationship between the body and objects has been historically one of the duties of design.

Design is tied into other ergonomic disciplines whose outer limits have been studied by functionalism in a systematic manner. By means of a scientific approach which allows the efficiency of the body in space and in relationship to other objects to be calculated, modern ergonomics has claimed to fix objective rules, rules which are definitive for all times and places. It has also optimized several relationships between man and the objects that he uses. Minimum-existence has even stripped down the ergonomics of space and has postulated the bases for those lines of design which have created a principal foundation and aesthetics out of essentialism and reduction. Alexander Klein’s research into the *cell* in the 20’s were emblematic, which systemized living according to essential categories along with studies into minimum spaces and his working logics. The case of the so-called “Frankfurt Kitchen” is also significant, planned in 1926 on the basis of the theory of standardization of Frederick, an American. In the conception of

Le Corbusier, the idea of furniture and utensils as artificial limbs even led to the consideration of industrial objects as a type of “orthopedics”.

Insomuch as a “machine for living”, generally speaking the house sees man who lives inside it positioned as if he were at the wheel of an automobile , in a factory using a piece of machinery or in an office sitting properly at a desk. In these abstractions and idealizations of the relationship between body and object within which modern man lives, in both working and private dimensions, he carries out sequential functions which are without ambiguity.

From this a rigid concept of the body is derived, reduced to an organism-machine regulated by physical-chemical processes. In this fashion our body is no longer *our point of view upon the world*, but rather *an object of this world*. Its senses are not its opening onto the world, its possibility to live within it, but are scientifically “organs” and “functions”. The body’s here and now is not its anchor point in time but rather a moment in time among all times. Let us abandon our *experience* in order to adopt the *idea*, which claims to be valid for everyone, in all times and places. (Galimberti 2002, 79)

In the 60’s and 70’s the body’s codified postures were shaken up by design: the plan experimented with new positions, materials, social inter-relations bound to furnishings without rules, to transformable spaces and objects. The planning scene moved from the 60’s to the 70’s and took into consideration the idea of a compact space, disarticulated and multipurpose. Flexibility, discontinuity, ambiguity were the key words which dictated shapes for living far away from the mechanical concept of the grill, repetition, of the functional unambiguousness of spaces and objects.

Already in the 70’s, Joe Colombo also revealed the possibilities tied in with the extraordinary development of audio-visual and communication processes , the consequent progressive loss of the importance of physical distances and the chance therefore to carry out plans for a ubiquitous and flexible way of living.

With the advent of the electronic era, design progressively turned towards other ideas which were light, disembodied, integrated into communication equipment. On the inside of this process a series of details adapted to the life of the post-modern man were expressed; the willingness to go along with a more fluid lifestyle, experimenting new forms of living. The *design of interfaces*, - analyzed by Giovanni Anceschi in his homonymous book, becomes the focus of the project in this new scenario.

Under the pressure of technological changes and new studies of commodities in the 80’s, functionalism as a methodology, which began as a general picture dipping down directly to define instruments and ergonomics, appeared as a paradigm of time-limited feasibility. Also the traditional distinctions between the various steps of the project - urban, architecture and design - progressively lost significance. The *function,* with the passage from a modern to post-modernist project, took on a *nebulous, opaque* connotation.

A *widespread design* which was no longer identifiable with a clearly definable planning step, a *swarm of projects* as Branzi wrote, is at the base of the proliferation of the system of objects in the post-industrial phase.

The traditional ergonomic vision bound to the modern project fell into a reality in which on one hand the true adaption of man to his own environment relies upon a macroscopic physical step (the crisis of the ecosystem and the quest for eco-compatible forms), and then on the other hand the most important inter-relation is situated in a dimension of pervasive miniaturization and communication development.

Info-objects start to invade the very bodies of man. In a fashion which is progressively insistent starting from the 70’s, technology started to develop around the body clinging to its very skin, responding to a touch of the finger on a computer keyboard, a mobile telephone.

Up to around about 1950 technology came to be understood as something external, an instrument which could be laid aside without being “contaminated”. Starting from the 70’s it took

on a pervasive dimension; it came to be viewed as a reality in which the subject was completely immersed.

Info-objects resoundingly modified the way in which the instrument was perceived –it was no longer inert and idiotic but educated and interrelated to functions (Marchesini 2002, 263). Info-objects are unusual because they tend to mix themselves up and emanate their nature into all of the pre-existing objects. They also tend to meld one object into another in much the same way as an *adhesive of the family of objects* in their amalgamation (Righetto 2000, 98).

The modern object is one used and occupied by the body, but which is put away after it has been used. Recently dematerialization and miniaturization instead make it possible that the body be incorporated by the project in a totally different fashion.

The post-human movement of the 90's brought into the foreground the hybrid character of the relationship between body and technology.

4. Object and body: a new centrality

In creating a world of objects man has gradually lost his functions, turning them over to the outside, objectifying functions and relationships well beyond themselves. In such a way man has created a unity with his own body with these things, of utensils and a wide range of products. The abilities of our own minds flowed initially in writing and today this occurs in electronic memories. With info-objects which invade the body, in some way an inverse process is starting up-this process is however in its initial stages.

That which is however happening on a wider scale today is that continually greater attention is being directed towards the technologies of conscience and virtual interrelations. It is also being aimed at the idea of a type of progressive atrophying of the body with respect to the infinite possibilities of expansion offered to the mind.

On the one hand the *body*, on the other *things* as concrete material objects would appear to have lost their centrality on the post-industrial technological stage which is based upon miniaturization and the virtual. In the myths of "immaterial" and "performative", with the whole stress upon the "connection", *the object and the body both become debased.*

So on the one hand we have a huge expansion of the possibilities of the mind and a striking *extension of consciousness*; on the other, vis-a-vis the *infinitely performative* world of the virtual, the body is essentially debased. However, at the same time and to a greater extent insofar as it is actually inorganic, the world of objects is also debased.

The body, freed once more and even more so by the new technologies of communication, is actually in a "condition of inferiority" in respect of the mind, since the latter is offered the tools of ICT and virtual reality so that mental faculties are expanded exponentially.

In its turn, the object, a simple material product or an interactive complex system whichever it might be, risks to be seen as a predictable outcome of a planning process whose attention is centered upon the *foreshadowing of the relations.*

The object risks to "lose itself", swallowed up in cross-fire of connections, in the processes and time which give a structure to the course. This loss is healthy in that it offers the chance to rebuild the sense of the object within a complex scenario and a system of values; but, as Virno observes, the exasperated stress placed upon the idea of "connection" rather than a thing in itself which leads to the celebration of a performative virtual world has negative implications. One tends to debase material objects, subjecting them to a view that devalues the "thing-value", the status of the thing.

The most diverse schools of thought have railed against the reification with a disparaging fury, seeing it as a passage from the interior to exterior, from the unreachable in manifestation and observation. This is a fury widely unjustified on a theoretical level, based upon a superstition

according to which that which counts in the experience of the human-animal is invisible and intangible (Virno 2003). This is an abstract conscience which would have superiority in the rationalistic culture over the so-called “material” culture.

Today scientists such as Varela warn us that in the field of cognitive sciences a change of definitions is slowly taking place. At the heart of this change there is the conviction that the essence of conscience is in the first place *concrete*, incarnate, incorporated, experienced. This concrete consciousness and its historical nature, its context is not “noise” which prevent a general model from being compressed into its true substance: it is rather the way we operate and the place in which we are (Varela 1994, 143-4).

New discoveries in neuroscience offer further ideas for a replenishment of several notions concerning connections between man, the body and objects. In fact researchers have singled out neurons (known as *mirror neurons*) equipped with a surprising property: they activate themselves both when we carry out an action and when we see others doing the same. Mirror neurons allow our brain to connect observed movements to our own ones, and to therefore recognise the significance of these movements. These discoveries in neurophysiology demonstrate that space is not represented *per se* in a certain area of the cerebral cortex, but its make-up would depend upon neural circuit activity whose primary function is to organise that collection of movements, which permit one to react within the surrounding environment, localizing possible menaces or opportunities. Therefore space would be the primary constituent in terms of *potential motor actions* (Rizzolati and Sinigaglia 2006, 69).

Serres makes an observation on this point:

“Mieux encore, ce mimétisme jaillit du corps, du système nerveux comprenant *ces neurones miroirs,* découverts récemment par des cognitivistes italiens et dont nous savons aujourd’hui qu’ils s’excitent aussi bien lorsque nous faisons un geste qu’au moment où nous voyons un autre le faire, comme si la représentation équivalait à l’acte. Ainsi le mime devient-il l’un des formats universels de nos conduites. Nous imitons, nous reproduisons, nous répétons. La replication propage et diffuse le désir individuel et les cultures collectives comme les gènes de l’ADN reproduisent et disséminent la vie : étrange dynamisme de l’identique dont l’automatisme redondant, repliqué indéfiniment, va se répétant.” (Serres 2005)

In a way similar to non-human primates, we are not limited to just moving our arms, hands and mouths, but we reach something, grab hold of it and bite it. It is in these acts, in that an act is not a mere movement, that our experience of the surrounding environment takes on a form and that things assume an immediate significance for us.

The essay on the gift of Marcel Mauss brings to light an important point: giving is grasping and immediately afterwards giving up that which is grasped, proposing to another the same gesture to be grasped (Mauss 1963). The connections between giving, receiving and exchanging provide the basis for a “total social fact” and they make the gesture of grasping of the person who concretizes the mechanism of mirror neurons symmetrical.

The same *rigid boundary between perceptive, cognitive and motor processes* ends up revealing itself largely factitious; not only does perception appear immersed in the dynamics of the action which turns out being more pronounced and composite than was thought in the past, but also the *brain which acts* is also and above all *a brain which understands* (Rizzolati and Sinigaglia 2006, 3).

These new concepts invalidate any idea of “inferiority” of the body with respect to the mind, and they clear the field from an exitless dualism for design. The opposition between the old ergonomics (overshadowed as it is based upon a mechanical body) and new theories of interaction with the object would see a complete prevalence of the mind and the virtual insomuch as it is “abstract” (with all the attendant dangers connected to this).

We can therefore come to two initial conclusions: things- by which we mean concrete objects-carry great importance in that they are *the way for embodying relationships between men*. They are not the “translation” of abstract factors that would play in fields held to be of

greater importance in singling out economic and social dynamics. The body is not the wrapping paper of “higher” brain functions but is in itself the foundation of the conscience, as new discoveries in cognitive science have pointed out. Both the things that the body draws on from that *concrete dimension of the conscience* that is peculiar to design, and whose centrality within the discipline of design, must be confirmed strongly.

The centrality of the body in the post-human vision does not implicate a rebuttal of the virtual unless where it that means *a retraction of the imagination in a world already totally re-elaborated by man,* eluding the comparison with nature as another with whom to compare oneself.

However, the constant comparison with nature as “another”, the comparison with technology as “another”, through research into increasingly newer and newer forms of hybridation,” instead opens up new evolutionary directions also for eco-design.

The withdrawal into a world that is increasingly re-elaborated by the individual, as is the case with the virtual world and the ICT dimension, leads to the cancellation of the *hetero-reference* offered by nature and *vital to the development of the imaginary dimension of humanity* – and therefore also vital in order to rekindle that *great visionary design energy* which is the missing enzyme for radical change.

The machine is located in a grey area amongst plain things and the person, for its ancient reference to the organic and animal world; both machines and animals in fact have always established *the dignity of comparison, the dark mirror* with which to compare oneself in order to build one’s own identity .

Following Serres, man has the faculty to transfer his bodily functions in objects; and to take advantage of this freedom in order to go further." Quand les scientifiques n'ont plus eu à consacrer l'essentiel de leur temps à mémoriser le savoir des anciens pour le transmettre, ils l'ont mis à l'épreuve des faits, donnant naissance aux sciences expérimentales. Demain, le corps libéré par les nouvelles technologies inventera autre chose (Serres 2000) ".

Design may propose itself as an interpreter of the body’s new possibilities in the post-human era; propose new functions for contemporary body, liberated by new technologies, but still unable to express this liberty.

5. Gathering together the things of daily life

Historically ordained in the observation of things on a small scale, design has always concretely contributed and constructed the space of the connections between people, the space of the “between”, through objects. In this significant sense it loses the power to define if such objects have the status of real or virtual things; nor is there a need to change the level of analysis, if only in the orientation of effort and energy used.

Speaking of his own work, Sigmund Freud wrote “My only single intention is to gather together things of day to day life and to use them scientifically.”

This seemingly modest statement may apply as an analogy to that apparently modest role of design, which has always been seen as inferior with respect to architecture. Without too much effort we may transfer this statement from psychoanalysis to design. In effect, design is the discipline which in the 20th century has studied in a scientific manner the minute objects of everyday life, magnifying them and revealing in them aspects which were hidden and particular, and often before unobserved. Through the use of this “magnifying glass” design has been able to give expression to emotions and desires - also unconscious - in a technically impeccable form, which is that of industry, going far beyond strictly functional requirements.

In the contemporary cultural panorama eco-design is the chosen discipline to observe and plan on the level of daily micro-technology and micro-interactions between man and the environment.

Based on all these premises, we can propose two directions for design research associated with hypotheses for future activity:

1) work for a *post-ergonomics*, for new ideas of the role of the body, not linked to an abstract neo-purity as a corollary of environmentalism, or in opposition to the virtual world.

2) starting from a *microsociology of daily objects,* working for the construction of an eco-system of effectively *light* objects.

The dematerialisation is a key element, while at the same time designing a system of objects actually able to free us from the burden and the exponential torrent of things.

We can highlight an extremely critical point: the so-called "death of things" is not contradicted today – but rather confirmed – by the remarkable multiplication of objects, produced at an astonishing rate and destined to have extremely short, and often useless, lives (Flusser 2003).

The wall of products, the repetitive barrage of merchandise - more or less arranged in an orderly fashion - constitutes the true building blocks of modern-day space. These colossal systems of products, repeatable to the Nth power, are menacing as they are the harbingers of an infinite amount of refuse.

In a post-human prospective, eco-design may distance itself more and more from the idea of an original purity and inviolability of nature.

Once these prejudices have vanished, eco-design can instead dedicate its own energy to disproving with resolve the ill-omened effects which come out of the useless multitude of cheap quality goods, and above all to the inescapability of this process. These effects bound into the invasion of merchandise are at the same time *microscopic* and *macroscopic*. They tie themselves to a variety of processes which operate on different levels, from packaging to the development of distributive models such as hyper-markets and their illusions of *disproportionate possibilities*.

These illusions in the acquisition of goods end up diverting attention from the same sense of living. An uncontrollable growth model has in fact the *implicit abandonment* of a highly important series of goods as a consequence. These are goods which, in an effectively eco-sustainable society, should be *widely accessible and ubiquitous, above all free, not substituted by marketable goods and services.* (we can detect them for example, in green areas, unpolluted air, accessible and safe urban centres, clean sea and accessible beaches)

But what directions should the culture of eco-design be moving in if it intends to influence this sort of change? Certainly that which it is already wholeheartedly doing: planning eco-efficient objects and systems in which life cycles might be studied in a scientific manner. However, in a manner which contains a proposal of comparing itself with a *microsociology of ethical mediation of daily techniques* (Pacciolla 2006).

The excessive attention given by philosophical and sociological analysis to sociologically evident aspects – such as assembly lines, nuclear explosions or ICT – commits the additional error of cancelling the immense network of object-subject micro-relations that constitute our daily world, ending up by simply creating a gap, a no-man's land that is the terrain for all sorts of prejudices and fanaticism (Pacciolla 2006).

The idea of filling this silent space can be accredited to authors such as Michel Serres and Bruno Latour, giving a voice to objects of technology which infest the chasm of the western social conscience (Serres 2002). Getting over the merely instrumental vision of the technical object in that it is simply an *intermediary* in the action of the subject, Latour has tried to relocate our attention upon the operation of "translation" and "substitution" used by those *mediators* which we could define as *daily micro-technologies* (Latour 2002). The mediation of a thing marks structurally, our living.(Tursi 2006, 117) Objects do something, they are not simply the screens or back-projectors of our social life, they instead carry out an important role in the creation of social fibre. In other words it might be said that we have been overcome by that which we manufacture.

However, this does not concern an apologia of the social micro scale. Latour warns us that

the social world remains *flat*, without even the slightest of waves which might allow a passage from the micro to the macro.

Here the potential key-role of eco-design: always considering “the object in its environment” as a minimum unit - without expecting to embrace omni-comprehensive dimensions belonging to others disciplines– design can react in a decisive manner upon change. It is important to remember design often involves minute elements, but ones which are potentially relative to a great number of players.

The exponential diluvium of things - *completely differently ruled and directed* - may therefore turn out to be a decisive fact for change.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

“Parasitic” Design Strategies for Environmental and Social Sustainability

Vision of a Diffuse Universe of Parasitic Products and Services

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Abstract

This paper proposes the vision of a novel scenario in the field of sustainable design founded on products and services which are defined "parasitic" because able to nourish themselves by draining energetic and material resources from surplus, wastes or from the "operation" of other systems.

The parasitic scenario can be imagined like a diffused “nebula” of smart and strongly communicating products that populate daily life, in domestic or public spaces, and are able to be visible by a great number and variety of people.

The paper will illustrate a design experimentation, verified in particular in the Campania region territory, where the decrease of consumption and dispersion of material and energetic resources is more than ever an urgent need.

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1. Introduction

The design discipline has extended its action range in the field of sustainability in the last decades. Starting from the definition of material qualities of products, contemporary designers have extended their intervention also to the construction of new conceptual and behavioural scenarios capable of conditioning people (Manzini and Vezzoli 2007, 242-252).

In this new dimension the communication of ethical principles, like the attention to sustainablility themes, represents an important responsibility for designers.

This paper suggests a new approach to design for sustainability called “parasitic design”, to create products and systems that “exist” since they “feed” themselves on material and energetic resources, which arise from the wastes and surpluses of other systems. These systems are often symbiotically integrated with highly dissipative systems, like malls or big industrial and office buildings to recoup their heat losses, water drainages or material wastes. Beside their functional efficiency, parasitic systems have a very important conceptual value.

The approach is set to take parasitism as an ethical message, which awakes people about subjects such as the scarcity of resources and the need to spare the not renewable ones. The contribution that this approach wants to offer to sustainability is to create sustainable products and systems, which convey sustainable messages. Products and systems are orientated to communicate with the greatest number of users in order to affect on models of consumption and on the community’s way of life in the deepest and widespread way. The research has sought to investigate on the idea of “the aesthetic of sustainability” in terms of communicative and ethical meanings.

The design for sustainability has provided precious methodologies and instruments in the last decades. These models, at present well consolidated, need to be applied and verified on a larger population, by extending an involvement process which, in the past, was limited to a very narrow and specialized target. It will be possible to translate principles and politics into concrete and radical changes only through great numbers.

The design of parasitic products and systems can take advantage from using a bio-mimetic approach inspired to processes and logical regulating parasitic living systems in nature. The vision shows a bio-hybrid universe of counterfeit similar to transportable, light, mutable organisms which are even capable of transforming and self-adapting themselves in function of the varying of contexts and conditions. A reappraisal of existing products in a “parasitic” way is able to solve local and specific problems taking advantage from locally available conditions.

2. Parasitic Approach. Biological References.

Parasitism is such a widespread phenomenal in nature, in organisms that live drawing nourishment from other systems. The word parasite comes from Greek παρασσυτισμός, which is a person who eats at someone else's table. In Biology “parasite is an organism that grows, feeds, and is sheltered on or in a different organism while contributing with nothing to the survival of its host”4.

Properties which generally identify a relationship of parasitism are:

[4] http://www.thefreedictionary.com/parassite.

- The parasite is devoid of self-life and it depends on the host to which it is more or less closely bound by an anatomical and physiological relation;
- The parasite has a simplified anatomical and morphological structure compared to the host's one;
- The parasite's life cycle is shorter than the host's one, and it ends up before the host's death.

In our methodological and project experimentation the aim is to sustain this idea not in the common negative meaning of someone who lives at the expense of someone else, but in a positive way of someone able to feed of the other's surplus. In this perspective the parasite becomes the "positive actor" that reuses the precious resources wasted by the system. So the meanings of positive and negative are switched.

On April 2007 at the NABA (New Academy of Arts), in Milan, a Workshop named "Parasite Design" was developed on the subject of the parasitism applied to design. The workshop was based on Marco Penati's idea, in which parasitism has been seen mostly in energetic and mimetic terms. The workshop carried out the design of some objects that change and modify their function by attaching to other ones. Without the "carrying objects" the parasite ones would not have any sense or life.

From our point of view, closely connected with environmental and social sustainability, it is not necessary that the parasite changes his host's functions. Its primary aim is to employ its waste. Furthermore, we aim to create systems that will parasite energy but even material surplus like water.

3. The Educational Aim. Strategic Approaches to Spread into a Social Community.

The approach that characterizes the "parasitic design" has a value that goes beyond the limited saving of resources achieved with the single product or application.

The value of these products is, in effect, of an educational kind, set to sensitize the greatest number of people about the irrationality of certain wastes, which characterize the way of life and contemporary uses. Their aim is to underline imbalances and inequality that everybody see but that almost nobody, for habit or laziness, detect in a critical and constructive way.

All parasite products and systems use a communicative approach oriented to induce behaviour models of consumption that are environmentally compatible and conscious. The scenario of parasitic products is arranged on two possible dimensions (strategic approaches) devoted to rouse a deep and widespread awareness:

- A household dimension in which parasite system takes part in the daily life of the living beings of the house, reminding them the preciousness of the resources used in their everyday activities. Systems that intersect little gestures and daily activities suggesting the reuse of resources usually not considered as such, as for example water that flows from an umbrella or from rinsed crockery, or steam from simmering of foods.

  Objects that awake the attention from automatic gestures and instil the doubt, the possibility to change, taking care not simply of that specific part of water, light, food or warmth used but of all the actions concerning with the resources. They can even report the presence of invisible streams that are potentially harmful for the health of people such as: electromagnetic fields created by household devices, wireless systems and mobile phones or toxic emissions.

  Parasitic systems bring forward settled ways of material and energy uses. The parasitism, in this meaning, gets a communicative and educational value, which

recalls people consciousness about the importance of measuring out precious resources and paying attention to the waste in the house daily life.

The research has tried to set itself towards products characterized by a symbolical value, which verges to poetic, and whose utility is more communicative and evocative than functional.

— An urban dimension to the urban design scale that fills with systems similar to offsprings, cocoons, flux prints, shells, that “clinging” to more material and energy dispersive manufactures or absorbing harmful streams (as smog and noise pollution) report their presence broadening the visibility of wastes and their consequences through their aspect. In this case products and parasite solutions are characterized by a strong communicative content and an highly, and sometimes abounding visibility that consents to the community to become curious and to interrogate about these “aliens” and their nature of “waste-catcher”, in a few words about the gravity of the wastes and the need to retrench, in a sustainable view, the activities in which they are associated.

Moreover, their existence and their message unveil even the gravity of some imbalances or paradox such as: the warm air that pour out from the air-conditioned buildings; the discrepancy existing among places too or in vain lightened and places dangerously too dark; the quantity of drinkable water used to wash objects. The urban scale of this dimension permits, particularly if the “parasite” is put in a very busy and crowded place, to give a communicative signal that will be received by a great number of people and that, according with our line of research aims, will affect in a widespread way on the rehash of behaviour models. These objects point out the irrationality of these wastes in an urban dimension that would appear as advanced and efficiently reorganized.

Both dimensions are characterized by a potentiality of daily impact in order to obtain a concrete leverage, and, as a consequence, a radical change, deep and widespread. Today it is necessary the shift from the deep awareness of few people interested to the problematic of the sustainability, to the awareness of many, to allow new styles of life able to make changes both locally and globally. Design has the role to make people absorb these ideas and to give the behaviours guidelines.

4. Parasitic Design View: Shifts between Literary Utopias and Technological Ratiocinations

The Parasitic Design is based on languages and images that come from several fields more or less adjacent to the design one. A multi-subject approach is than necessary in the construction of this scenario. Literature, cinema and contemporary art have an important inspiring role. But also the input of subjects such as electrical engineering, hydraulic and materials research are necessary to guarantee the practicability of the project experimentations.

The technological ratiocination has been unveiled of his structural unperfectiveness, especially to read the socio-cultural phenomenon of the modernity. Consequently we are able to feature the reality with a new approach and apply it in the construction of a changing universe of object, innovative in their generating principles of this parasitic design scenario.

The representations of the literature and of the cinema are often mutually mingled with the futuristic realities of the design. There are several examples in literature and in cinema that have often mingled themselves with the most different outcomes. We cannot think but to Jules Verne who was able to anticipate discovers that in his books seemed of simple fantasy but that later, would be actually realized in a serious and scientifically tested manner.

It would be enough just to quote the futuristic views of *Fahrenheit 451* by Ray Bradbury that in the cinema version by François Truffaut it becomes a future world animated by present objects. The design becomes representative of the metaphor of the future, that doesn't correspond to itself anymore but to an iconic idea of a foreshadowed world (Brunetta 2000, 646).

Also in *2001: A Space Odyssey* by Stanley Kubrick, inspired by the short story *The Sentinel* by Arthur C. Clarke, is realized a co-participation of several communicative medias, exclusive and original for the period. These aims can be found in the same Kubrick's words, when he says "everybody can inquire about the philosophical meaning of the movie as he likes, I tried to represent a visual experience, which goes round the comprehension to go deep in the unconscious with his emotional contents". Once more the present objects are representing a hypothetical future (Brunetta 2000, 829-830).

The relationship it is not always univocal; often science takes cognitive and testing paths starting from the literary scenarios.

Perhaps the inspiration of the late technological applications is the work by Frank Patrick Herbert who, with the series of *Dune*, faces difficult themes such as the human survival, the evolution, the ecology in the mix among religion, politics and power.

Symbolically programmatic is a quote by Frank Herbert who says: "Something cannot emerge from nothing" and he goes on: "The beginning of knowledge is the discovery of something we do not understand".

Apart from the literary and cinema success (David Lynch in 1984 took from the work by Herbert the homonymous movie, *Dune*) (Brunetta 2000, 257) it is sure the influence of the patterns by Herbert in all the latest technological experimentations on products and technologies called "parasitic" in our meaning, above all about the rehears and the supplying of alternative energetic resources.

The desert landscapes of the Arrakis planet, with their difficult ecology without every possible source of human nourishment, obligate the characters of the novel to sci-fi survival devices as expedient to save every single drop of water and to manage daily the life in a strongly adverse habitat.

The modern technology and experimentation have taken entirely from these hypothetical expedients to hypothesize extreme and odd applications. The fields of application are, at the start, just the one of military field, in which the expenses of the testing are more acceptable.

From *Dune* we could extrapolate some meaningful description that have inspired several research groups in the definition of converging hypothesis into projects.

Clothes, which take energy from the movement of who wears them: "*Paul sat on the edge of his bed and began stripping off his desert boots. They smelled rancid from the lubricant which eased the action of the heel-powered pumps that drove his still suit*" (Herbert 1965, 307).

The research in the filed of the electrical energy is inquiring about the quantity of energy that is possible to parasite exploiting the energy produced during the walking by trying to apply parasitic-power harvesting system inside the shoes. An example are *The Dada Sprees Supreme* atheletic shoes that have the characteristic of a "spinnah" built into the outer surface of the shoe, positioned on top of the ankle. While walking you put weight on the heel of the shoe and so the spinner moves. In this way the shoe harnesses the usual power of walking.

Systems that, thanks to the use of innovative materials, gather the atmospherically moist to feed plants: "*Each bush, each weed you see out there in the erg," she said, "how do you suppose it lives when we leave it? Each is planted most tenderly in its own little pit. The pits are filled with smooth ovals of chromoplastic. Light turns them white. You can see them glistening in the dawn if you look down from a high place. White reflects. But when Old Father Sun departs, the chromoplastic reverts to transparency in the dark. It cools with extreme rapidity. The surface condenses moisture out of the air. That moisture trickles down to keep our plants alive*" (Herbert 1965, 271).

Likewise the MIT researchers Robert Cohen and Michael Rubner were inspired by the behaviour of the Namib desert beetle, that is able to use the moisture captured with the special surface of his back, to develop a material that can capture and manage small amounts of water. As in the novel, in order to plant vegetation, special materials are used to create collectors, to get together even the tiniest quantity of the moisture of Arrakis planet.

Systems that takes drinkable water picking the condensation accumulate on rocks: "*Stilgar stopped at a yellow rock wall. He pressed an outcropping and the wall swung silently away from him, opening along an irregular crack. He led the way through past a dark honey-comb lattice that directed a cool wash of air across Paul when he passed it. "That air felt damp." A man behind them said "Plenty of air in the trap tonight*" (Herbert 1965, 315).

Using these easy strategy, the Arrakis citizens of the novel were able to drag water from the planet's atmosphere. Following the same aim Aqua Sciencs has developed a itinerant system that can generate fresh water by using the atmospheric moisture. The project is developed from DARPA society beneath a agreement with the US government to supply fresh water to US troops in Iraq.

Systems founded on smart textiles that take energy from the transpiration of the body of the inhabitants and from their breathing: "*The skin-contact layer is porous. Perspiration passes through it, having cooled the body. Motions of the body, especially breathing, and some osmotic action provide the pumping force. With a Fremen suit in good working order, you won't lose more than a thimbleful of moisture a day*" (Herbert 1965, 307).

The company CSIRO has created a wearable recharger system for Australian military called FIED (Flexible Integrated Energy Device). This tool is made of three components: advanced and conductive fabrics for the battery, a vibration power harvesting mechanism and a rectifier/power management system. The tool is used to power the electronic equipment of the soldiers.

The Instructables website thalks about the possiblity to build up a mechanism that scavenges power directly from the human breathing and lets carry on the energy as electricity for USB devices. The project is called Breath-Powered USB Charger.

In the aesthetical-communicative definition of the parasitic scenario we also take the hint from the contemporary art field, mainly from the analysis of the aims and the intentions of the programmatic and kinetic art.

The expressive needs of the programmed art were set in a new art and artist role in relationship with science and technology and of new methodological approaches. This happened in a period in which the thought about the society and the cultural changes were really intense (Dorfles 1999, 78). This kind of approaches, according to us, is what mostly ranged up with the aims that we wish to delineate when we talk about the theoric approach of the parasitic design.

The poetic of the kinetic and programmed art is about works in which the communicative effects take place from the psychological involvement with the audience. The possibility to interact is previewed and studied to stake all, statistics as well as random and probable factors. The aesthetical results are equivalent to the technological advances. The experimenting component is essential as the test of the models (Dorfles 1999, 79-80).

The communicative aims are undeniably fundamental; the geometrical principles are the rules for the representation. The work has the aim to support actively the comprehension and the knowledge. The artist change his "look", he works in a team with the technician and the scientist, he start to mingle art and society (Dorfles 1999, 79-80). In the same way the parasitic design approach has not to be only functional but above all communicative and dialectical with the user. According to us this is the path in which design has to approach to the project. A path not only functionalist and aesthetical in the strictly meaning but a path in which technic, function, aims, aesthetic and communication are integrated in the project, giving back an object semantically functionalistic.

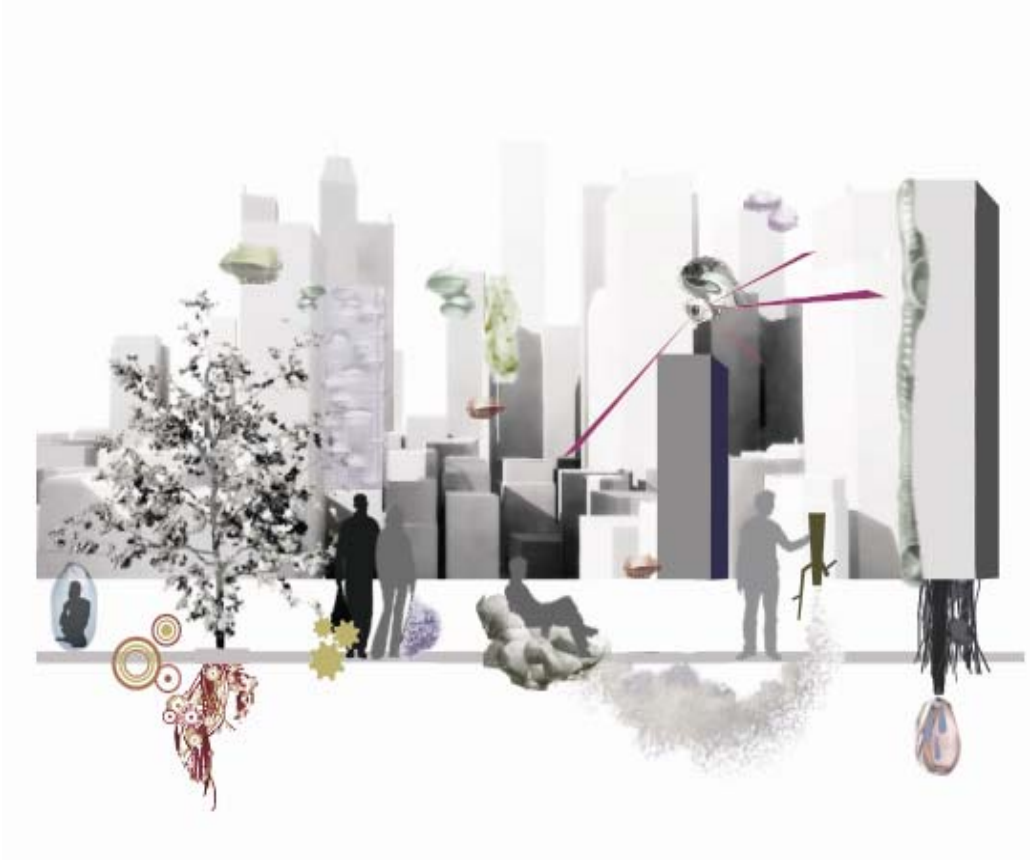

Fig. 1: Visualization of *Parasitic Scenario*

5. To Parasite resources. Strategic actions

The household scenario is made by a great number of objects with which the user relates daily. The relationship between the inhabitant of the house and his habitat is made, hence, of daily gestures, well-settled in the time, which decide the establishing of really strong relations among user and object or household devices. In the living dimension, the need to satisfy a demand face itself with a series of gestures, often ordinary and automatic, that tale the interaction with the objects which populate the household landscape. Every product, after having been taken as a “brand-new”, goes quickly in the common universe of accomplished wishes. Probably as we have a frequent and easy access to all modern conveniences we don’t reflect about the environmental effects, and in particular about the consumptions linked to the ritual gestures we repeat in the daily life. We don’t ask about what the lightening of a bulb or the opening of a faucet implies, there is just the need to enlighten or to wash, but not the consciousness of the consumption of electricity or water. The same unawareness comes out using some domestic devices that, besides using resources, produce emissions sometimes harmful for health.

Every action with an aim needs the use of resources to reach it. When action is too automatic there is the risk not to pay enough attention to the consumption. So asking about our

daily gestures means to give the right value to actions with an environmental impact and to the risk of a not proper use of the resource we dispose of.

To develop and nourish an awareness about the scarcity of the resources, several products monitor their energy use with electronic devices, which report with visual signs, lights or auditory messages of alarm an excessive use (Backlund et al. 2006, 6-7).

The parasitic strategy in the house dimension derives, hence, from the direct observation of the daily gestures and objects, and it proposes to intervene in their functionality or even better in the user behaviour automatism.

The household parasitic objects are born from the user observation in order to find out potential resource wastes, not to be released in the environment. Such an approach aims to rehash and optimize the use of resources, and at the same time, using the relationship of correlation between the parasite and the parasite object, unveils the dissipative nature.

The parasitic design approach proposes to involve people exploiting the strong relationship of cohabitation they set with the house devices, and to transmit an ethical message oriented to stimulate a deeper awareness. An awareness that is “turned on” when the continuous relations between the inhabitants and objects of the house is interrupted by the intermediation of parasites. This break leads the user to observe with different eyes his actions and to examine again the relationship between needs and resources wasted during their fulfilment.

It is not really important, in this view, that each of this little “domestic parasite” can save a little quantity of resources through the rehash. What makes effective this approach is, instead, the presence of these systems, in the greater number as possible, in everyday actions, which becomes a sort of educational path that takes place between the house walls.

The educational aim of the parasitic strategy is, therefore, to avoid that a series of wastes, hidden in the private scene, can have consequences on large scale when multiplied for the collectivity. At the same way more aware individuals are able to avoid minimal quantities of wastes that, in relation with the persons that daily do the same actions, become remarkable.

The design experimentation we are carrying out wants to define new products that come out of the analysis of the house scene and are sort of “offsprings” that use the environmental surplus of the house changing it in a life source for themselves.

Systems and products that answer to the innovative requirements and, above all, generate a discontinuity breaking the common stream of action, transmit the educational aim of the parasitic design producing important thoughts in the user.

The design experimentation addresses sometimes innovative technologies that can be able to support the conversion of the emissions in resources.

The view of the parasitic design spreads creativity borders to the field of the design for the sustainability. The creativity becomes essential to have a new approach with the consolidated domestic scene helping to wreck down the dominant idea that feeds the “vertical thinking” of the logical method. On the contrary the “lateral thinking” that uses the logic, instead of being driven from it, is able to help the human mind that excels in the elaboration work, to overcome the scarce attitude to have new ideas (De Bono 1967, p.17-23).

The design experimentation can be illustrated according to the kind of resource they refer, that is from the water to warmth, from the harmful emission to noise, from vibration to light.

- Making use of the technology licensed by the American company *Eneco,* that has created a device named "Thermal Chip", able to turn the warmth into electricity, the concept of the product line *No-ou* wants to report the abuse of some technological devices that dissipate thermal energy. An example is a “laptop stand” that turns the warmth left from the cooling rotor in a little quantity of energy to rehash for function linked with the computer use. The reuse of the thermal energy is characterized by a strong visibility and by an intense communicative content. In these systems the

parasite and the host are linked by a physical element in which takes place an unidirectional stream, where the functioning of one is completely subject to the excessive use of the other one.

- The increase of the electromagnetic waves, that are the cause of the so called electromagnetic pollution, deriving from the emissions of the growing number of telecommunications systems and of electrical devices, is an invisible risk for health. The product line *HERTZanHERTZ* is born with the idea to make perceivable the otherwise invisible electromagnetical fields just to sensitive the users towards the unrestrained use of some devices that can be dangerous for the health. Besides this, using the potential of the *Meg* free energy project, motionless electromagnetic generator, able to catch the electromagnetic waves turning them in to electrical energy, is possible to reuse a little quantity of the emitted energy.
- To face the thermal and water waste a product line, named Do't, has been created. It aims to report directly the wastes or simply to optimize the use of the same resources. They stop the fluxes before their dissipation becomes irreversible and turn them in reusable resources. The objects have simple forms and expressive functionality, to amplify their educational value suitable for every age and education level.

In the scenario that characterizes the urban dimension, people streams, information and energy mingle together. From these streams come out emissions of every kind: emissions of cars, crowd noise, strong vibrations caused from transportation means, air conditioning machinery warm air streams, lightening streams often outrageous and un-useful in the commercial or accommodation activities. These emissions can't be attribute to a particular being but are the result of a collective consumption of remarkable proportion. For these reasons in this context the user loses the direct and consequential relation established in the household dimension and the possibility to control the dispersion of resources.

The pollution and resource waste problems is particularly urgent in Campania region, where there is a high density of population with a scarce attention to environment and public places. To the urban scale the individual hides behind the multitude but, while his carelessness and unconsciousness can produce serious damages, his awareness can produce positive effect enlarged by the collectively.

We have imagined the landscape of parasitic products in the urban dimension as a skyline of strongly effective systems, not really mimetic, whose figurativeness is the support for a continuous and wide diffusion of the ethical message linked to the parasitism.

The communicative aspect of the parasitic objects in the urban dimension becomes an essential requirement, his understanding has to be immediate and easy, to catch the attention of those inattentive and frenetic citizens, who go blind through places. A products family that crowd the city as off-springs, cocoons, tentacles, which necessarily induce the mass to wonder about their presence. The same mass that question about the reason of a concentration of this sort of organic shapes in places particularly dense of humans, linking the subordination between the anthropic activities and the wastes. In the domestic dimension the visible energy stream between parasite and host objects activated by the user through the daily gestures, in the domestic dimension is substituted by the visibility of the urban parasitic organism that, with its invasiveness, report the relationship with the public dimension. The single user through the acquisition of a more aware use of the resources, makes a transposition of this teaching in his domestic universe to join his single efforts to the community ones (Silverstone and Hirsch 2003, 3).

In our design experimentation we often have conveyed technological support from other sectors. These experimentations have been taken from the field of the nanotechnologies resulting from the medical and military research. These are in effect the two fields in which the technological research gives advanced solutions. In particular in the medical field one of the necessities is to make autonomous, as part of the organism, all those artificial elements that the medical technology has settled-up in the surgical field (mitre valve, pacemakers, etc.). The basic

idea is to use the emission and the energies of the body itself for the autonomous functioning of the little prosthetic systems.

- *i-Acto* project has the aim to turn the energy made from the urban noise and vibration coming from the traffic through technologies experimented during the VIBES project (Vibration Energy Scavenging) that introduced a micro-device called *Mk2* able to generate electrical energy turning it from the environment vibrations. The skill of the device experimented is of 46 microwatts against the 52 hertz of the vibrations, typical values of the vibration in the industrial field. The energy afterwards is given to the citizen as free through columns that permit to transfer it in the telephone apparatus or to i-Pod devices in temporary energy mode. The energetic “download” emplacements can be put to re-functioning point of urban stop as the public transportations ones, giving to the user the possibility to use his own devices.
- The project called *Most-Moist*, is instead orientated to reappraise the different and several water urban emissions, from the ones produced by the air-conditioned machineries, as condensation, and the ones that is possible to rehash as the moist in big public spaces. The project uses the transfer of the innovative system *Aqua Sciences*, experimented by the *Darpa* society, as well as the US Government for its own troops in Iraq, for the production of drinkable water (the system is able to produce over 5 litre of drinkable water turning it from the atmosphere moist at a really reduced expense of just some cent to the litre). So the water rehashed is usable to feed complex and communicative systems of furniture or urban shielding, able to support also vegetal installations in different functional configurations.
- A design experimentation oriented instead to the rehash of the light of the night resources is the *Ligh10* project. The observation of the human environment above the design concept permitted to underline that a noticeable quantity of light is used in the night hours, without an exact functional need. In particularly the shops in the big expositive places like the malls, lightened even in the closure hours. The project, using the technology of the optical fibres, transferring the light to a far distance without dispersion, wants to focus the light urban sources towards street unlighted, making road signals in optical fibre that permits a better use and eventually a requalification of those urban areas scarcely lightened. The light signals are, besides this, projected following the orientation of the design and of the graphical communication to denote the intervention in a project that would be completely design oriented, as much in his functional aspects that in the communicative ones.
- The whole of the experimentation named *Humangy* is oriented to parasite the motor energy of individuals, and it is the only case where the used energy is not wasted, since it comes from a physiological process. This energy unveils itself useful since it is not usually rehashed, in particular the one where are turned the mechanical spurs linked to the crossing off a lot of people in places very crowded and the one linked to the movement of the youth in discos or in gyms.
- The product line named *Baby Power* is dedicated in particular to the children’s games where the parasitivism of the energy is particularly effective for the future generation, and that will face the resource border in a more dramatic way in comparison with today, to guarantee the planet survival.

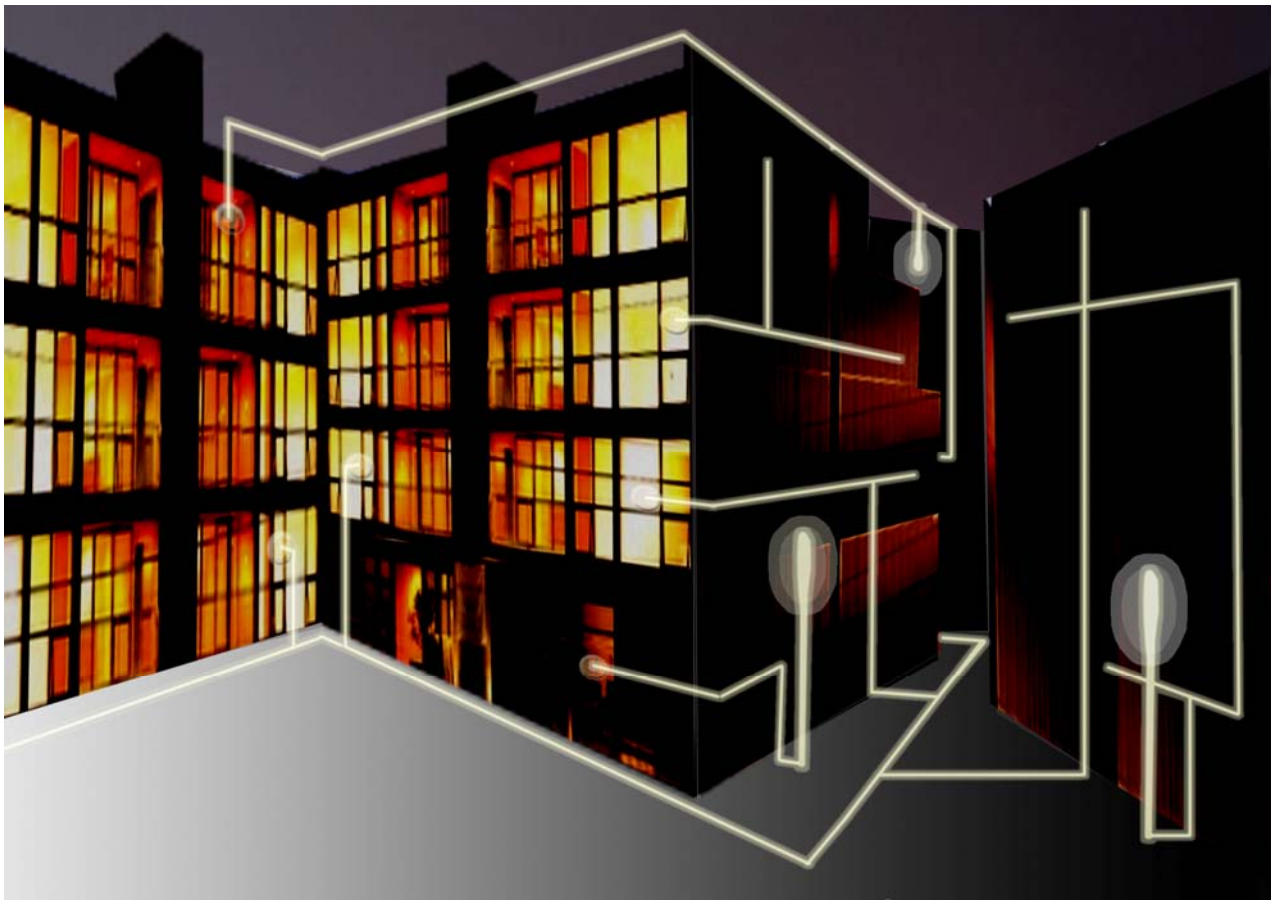

Fig. 2: *Ligh10* visualization

6. Conclusions

The parasitivism is not to be comprehended only as a material product but also as theoric and systemic. Parasitic is also every action giving even a low level of opposition to the environment, opposition, which above all results in a series of functional accommodations that we can define anonymous.

The mere presence of parasitic “actions” is itself a catalyst of attention compared with the physical-theoric precincts, where the common streams of social communication are cut off, acting as friction and exception points. Then such a parasitivism and its interpretation could represent the heuristics vector in the time of globalization.

One could even think that a parasitic orientation could figure the “fate” of every future object and action, as adaptive strategy of life, ideal in an environmental condition now-a-days chronically deprived of rules and of temporal meaning. This is typical of a hyper-complex society, which offers limited points of grip in short pauses, are these both theoric and material.

These are the spaces of the physical and theoric compensation resulting from that adaptive factor that is the success of the man-hood in the environment. In the design practice, concretized in design project, such as the aesthetical values and the relationship between shape and function, has to be necessarily reshaped in the perspective of a new technological vanguard. New “objectualities” are therefore defined as the iconic representation of new functionalities. The

future, already present, of the alternative energies, widely proved and applied in architecture, following the theoric field of the environmental sustainability, is the rearguard of a new period, the one of the self-produced energy. Here we define the theory of a future environmental approach, where the premises of a new method to this phenomenon represent new life surfaces, thanks also to the experimentation in technologies. Then we draw the new borders of the design creativity in the vanguard time that will be represented, necessarily, with a series of design “opportunities” punctual and performing .The basic points are represented by interstices and knots, as a result of the noticeable and critical points of a life chart more and more homogenous and linear.

Projects have been put inside a map to describe graphically the parasitic design scenario. They are inserted respecting the different impact strategies. In the map the projects have, therefore, a different design scale, that goes from the urban one to the residential one, with different communicative and technology complexity values. The projects are besides divided following the parasitic discipline fields, above all using as the discriminating feature the kind of resource to which they refer. So we have urban and private scales projects, which apply different technologies and aims to “parasite” sources and energetic emissions that go from the light to water and heat, from harmful emissions to vibrations. The purposes of designs at urban scale are the ones firstly comprehended in a subject about the social and educational aims of the parasite design. The concept of the scale project has in effect intrinsic aims such as the communicative wilfulness that we believe to be the path towards which all the contemporary design must and can essentially strive.

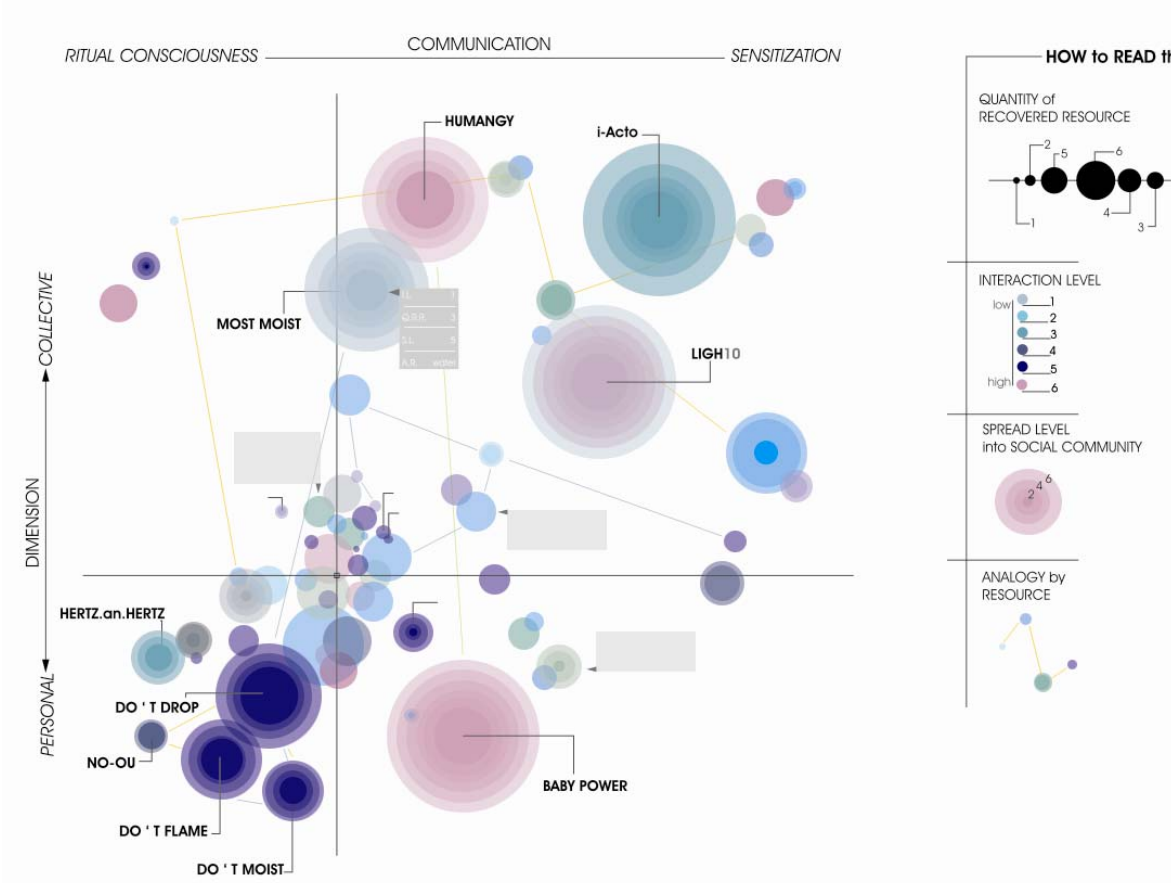

Fig. 3: Parasitic design map

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Social Innovation and Service Design of community-based tourism

The case of Prainha do Canto Verde, in the State of Ceará (Brazil)

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Abstract

This work considers to critically debate the concept of social innovation in the scope of service of an emblematic case of Brazilian community based tourism.

On the basis of a theoretical debate of concepts, we will present the case of Prainha do Canto Verde, model of a socially responsible tourism, developed by the proper community valuing cultural, ambient, economical and social dimensions.

This experience constitutes in a new relational standard, that propitiates a more personal, direct and dialogical relation between the tourists and the hosts. The lecture of this new paradigm allows them to point to some important issues with respect to service design and on the proper role of the designer, as co-design and the multi-disciplinary projective.

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1. Introduction

The objective of this work is to critically take into account the concept of social innovation and the interconnections with service design, having as reference an emblematic and successful case of community-based tourism. Prainha do Canto Verde is a small fishing community located on the east coast of the state of Ceará, in Brazil the promotional of a project of innovative and creative tourism, but over all a dialogical and participative base communitarian project.

The choice of Prainha do Canto Verde is a concrete reference in the debate of service design and social innovation, the fact that this initiative presents a different model for the development of the tourist sector. This new model, represents a new paradigm, which directly involves the residents to the revenues and the profits coming from the tourism activities. Based on a process of participative planning, a singular experience was developed that involves a series of services that respect the environment, local cultural value and at the same time promotes the dialogue between residents and tourist.

The initiative began with the intense mobilization of the community against the actions of real estate speculation developed by the tourisms great industry. This auto-organization stimulated by a threatened identity of survival, constituted the base to promote a type of alternative to industrial tourism, focused on the autochthones demands. The process that led to the model today consecrated of community-based tourism passed by various phases of construction and evaluation, between which was the analysis of the impact of tourism in neighboring beaches and the construction of future scenarios. The whole process was characterized by democratic and critical debate that, not only interested the community but also other represented actors, and other participants, between which NGO's, offices of government and other public and private institutions.

The delayed process of debate about tourism took to the setting some lines of direction in tourism activity to be developed in Prainha. It was decided, for example, that this activity would complement the main economic activity of the community, namely fishing, it would be managed by the members of the community and it would not change the local lifestyle. The result was a tourism model that allows tourists to have a different relation with the supplier of the service, a relation characterized by proximity, intercultural dialogue, and at last, a more spontaneous and real relation.

This type of relation that happens in the community-based tourism experience of Prainha de Canto Verde establishes a new relational standard, and represents, in our vision, a social innovation. The way that the community drew this series of tourist services was of participative form, empowering the local quality of life and valuing the proper cultural identity. Many of the instruments used by designers, such as the similar analysis, the development of briefing, the construction of future scenarios and the establishments of direction lines, among others, have been incorporated intuitively in the debate.

These elements will allowed to start a fertile reflection on the role of the designer in the participative process of creation and planning of services, and his possible contribution in creative action. At the same time, this leads us to possible interconnections and formats of contributions between professional design and "tacit", design between professionals of the area and the parts directly interested in the process. We will argue about these ideas and their "co-design" possibilities in the perspective of social innovation, thinking about projects focused on maintenance and stimulation of well-being of the local inhabitants in more real and genuine relations and the promotion of the social and eco-ambient support.

The text presents, first, the concepts of Social Innovation and Service Design, and secondly shows the case of Prainha do Canto Verde, in the light of theoretical reflections, to start a critical analysis.

2. Social Innovation

The concept of “innovation” has been around for sufficient time to be a central subject in the contemporary debates and over all in the developing countries it covers an excellent weight, therefore it brings the hope of change and inversion and/or overcoming of these situations and mechanisms of poverty and social exclusion which mark and define these realities. What interests us, however, is social innovation, or be it an innovation that is directly involved with the humans in the society.

Traditionally it is easy to observe the existence of one strong concept identification of innovation within the economical and technological areas, and when talking about social innovation the reference seems to be the only one possible and imaginable. Thus the experiences of detached and awarded social innovation, internationally and in Brazil, in reality have to deal essentially with technologies applied for social innovation, restricted in the economic field.

In this vision, therefore, the human as a social being appears as an object or receiver of “innovation”.

Contrary to this position, we believe that the basic condition to speak about social innovation is an active condition of the man as a social being, that means a being in a society and therefore the way of the man to be in society is fundamentally a relational way, we can extend our definition by affirming that the social innovation in our vision is dealing with types of relations, in particular, with the “creation” / experimentation of new relational standards, not forgetting that relations are an active condition.

To speak about social innovation according this perspective, in the scope of tourism, means to focus at two aspects, or better, two types of relations. On one hand, the relations between inhabitants where social innovation would have to deal with an inversion of roles in the local community of the proper destination. A situation in which the “silent native” (Krippendorf 1989) starts to speak and is assumed as a basic agent in his proper development. This has to happen, mainly with the participation of the community in some phases of the creation process, implementation and management of the tourist project. At the same time what is of basic importance is not to forget that for the creation proper instruments are necessary. These instruments of participation, in reality, would function as catalysts of new relational standards therefore, in fact, represent new rules of conviviality.

There can be created, thus, a public space for the meeting of inhabitants, in order to associate, and also for representatives of other institutions and other involved actors. This “new” public space could increase the possibility of the relation between the people and the conviviality between them, being a space of community meetings, in the words of Illich (1976), a space of conviviality. It is in this space that they will debate the future of the community, therefore planning a space of design, where is argued in participation the directions of the community.

To speak of social innovation in the scope of the tourism means also, to focus another type of relations beyond the one between inhabitants in the scope of management and planning, namely, those between tourists and autochthones. Generally this type of relation is characterized by distance and at times, contraposition, when not the separation of two worlds. To think about social innovation in this specific relational scope, therefore, would mean to imagine other formats of contact and interaction between these actors where the dialogue between otherness is allowed. Over all in the case of tourism in a communitarian base, where these kind of meetings happen more easily, therefore this is a kind of tourism that approaches the people more than conventional tourism, where the same sight of the local inhabitant is “not an enclosed experience” in the package offered to the tourist .

3. Service design

As Langenbach explains (2008) “design of services appears for the necessity to bring a more humane vision to the services, wherein new technologies are used by the society, toward an improvement in the quality of life, being, in a way to project and organize a form to stimulate and improve social relations” (p.32).

We want to think of service design as a knowledge about a vision that joins the aesthetic and the symbolic aspect to the one of functionality. The change of perspective is involved in a new use of t technologies that would really pass to be used by the society and toward an improvement in the quality of life, being projected and organized in a way that it is able to propitiate the form and to improve social relations. In this new perspective, design of services would be, therefore, the attempt to rethink the social relations; this vision would gain force by the necessity to bring a more humane look to services, since the form where the great majority of the services is planned and organized has generated great consuming of social fabric, destruction, poverty and misery beyond having contributed with an increase of scarcity of environmental resources.

The study of service systems, through a boarding of design, it would be a form of projecting more humane services. An important step in the boarding of service design is therefore, the same concept of “service” used by designers in the hour to project. The first question in the concept of services is to rethink the proper service. Manzini (2007) places the question as a change that has to do with our point of view, using each time the objects for the services, seeking the essence of the service. Goldstein et al. (2002) approaches this perspective, thinking about the deconstruction of the service through questions how it functions and what is it made of, and the integration of these two factors, or trough components making it possible to identify some elements of the concept of service, checking the relation to the necessities of the customers and redesigning these elements, understanding the idea of service as an experience. Another characteristic would have to deal with the fact that the nature of the service must be clear and to be shared by all the involved people in the service.

Understanding the redesign and the conception of the service by service designer is obtained to better understand the performance of designer and the proper concept of the service design. For Pine and Gilmore (1998) service design would be design of the experiences of the consumer. Candi (2007) speaks about the multidimensional vision of design, and strengthens its role as a distinguishing element, as well in the services as in the products, and places its success on the differentiation and the innovation. She remembers us that design has to think and to project the services on three dimensional bases: visceral, functional and experiential, with special attention to social relations between users and supply service providers. Transforming the look on the activity of the service into a relation where people of two types are involved (the user and the supplier), opening the possibility of an activity based on dialogue.

The man and his social relation, therefore, start to be the specific focus of service design. “The idea of service design means to me to seek improvement of services and to mainly study the interactions between the involved actors, with intention to make possible a more sensible agreement of work and life, opening space for the more creative, spontaneous and playful characteristics and relating these characteristics to the construction of true dialogues” (Langenbach 2008).

It seems, natural that this relatively new field of knowledge, study and somewhat relative application emphasizes experiences, but a type of experiences that involve people, or so to say, interpersonal relations. Design of service, therefore, seems to suggest the most proper space to rethink the forms and the formats of the relations, namely, the services.

So that social innovation deals with experimentation of new relational standards, and that service design has as focus the human and his experiences in social relations. We will try to bring these reflections in the field of tourism, a scope of activities characterized by reserved centrality on services.

We believe that it is interesting to bring this reflection to think about a possibility of more humane service terms and dialogue, in a relation to the question of the community participation so that the question of visiting tourists has to do with democracy and the social inclusion, beyond that the question of quality of life and ecological conscience. An already emblematic case and classic reference in community-based tourism is the case of Prainha do Canto Verde. The experience of this case that will be shown in the following segment.

4. History

Prainha do Canto Verde is a small fishing community situated in north-eastern Brazil, in the municipy of Beberibe, on the east coast of the state of Ceará, 120 km to the south of the Fortaleza, the capital. The community always lived of fishing and its culture is dependent on this activity. In the end of the 70's, however, the real estate speculation advanced on a great part of the east coast of Ceará and arrived in this community in 1979, with purpose to regularize an area of 2 km to the beach and measuring 750 ha (inclusive the sand bench), for one of the main squatters of the region, with a favorable decision of the judiciary of the region. This area was sold to the real estate (partner of the squatter) and from this situation the real estate dispute between inhabitants for the ownership of the land (rights of use) was started. This dispute extended for more than one decade and provoked diverse conflicts between the inhabitants of Prainha do Canto Verde and the real estate and its "body guards". To defend to the actions of the real estate, the community of Prainha do Canto Verde had the support of the Center of Defense and Promotion of Human Rights (CDPDH) and in 1989 the Association of Inhabitants of Prainha do Canto Verde was created. The fight for the land extends until today, however it is restricted the judicial sphere. The question of the land represented the common cause that took the community, under threat to proper survival, if auto-organize this movement of union contributed by identity reinforcement which is a basic in the creation of the new model of tourism of what they had become promoters for. We can observe, with Bauman (2005), he was there at the moment at which the Prainha felt the proper survival threatened, which reinforced the identity question. In this context of "reaffirmed identity", in a unfavorable economic conjuncture (a decline of lobster fishing and the utilization of fishing with engine and compressor – which is an illegal but widespread practice) the necessity appeared to debate about alternative economic resources for the community, between which the tourism was presented as one of the most interesting options, which favors also a strong investment of the state and federal governments in tourist programs. Thus the discussion about tourism in Prainha do Canto Verde started in 1994. It is important to point out that, the rising of "communitarian eco-tourism supported but still incipient organizational capacity of the inhabitants mobilized by the ownership of land" (Bursztyn et al. 2003).

5. What type of Tourism is this?

With the concern of negative impacts of tourism, registered in the experiences of neighboring tourists beaches, during four years there was developed a process of matureness through debates lead by the association of inhabitants, that culminated in the realization of the "First Seminary of Communitarian Eco-Tourism" in 1998 during which the inhabitants, together with other supportive institutions[3] had elaborated strategies for the development of tourism in this place. It was from these debates that the type of tourism that they wanted for Prainha were defined and also parameters and conditions were defined too.

[3] Between these institutes are Instituto Terramar, Conselho Pastoral dos Pescadores, secretary of environment (SEMACE), tourism (SETUR) and social action of Ceará State; *Bom Jesus dos Navegantes* school and the Mayor of Beberibe.

It was established that the type of developing tourism would have to be socially responsible, respecting the environment and valuing the local culture. It was also determined that tourism would have to be a complementary activity to fishing, which remains the main economic activity of the community. The intention was to preserve the proper way of "traditional" lifestyle and it was recognized that fishing had a basic foundation, therefore it was recognized that to value its proper culture it meant affirming the fishing culture. It was also defined that the tourist activities would be exerted by the proper inhabitants.

"The tourism that we want" became the motto of this new type of tourism and it bases on the desires and the necessities of the local community, and its capacity, in turn, the paradigmatic question of a new type of community-based tourism (TBC)[4], was developed from principles, estimatives and different values.

The mobilization politics in defense of rights to land was, therefore, the necessary condition, through its action of reinforcement of the identity, that allowed, the sprouting of this new type of paradigm. It is one strong identity, in fact, that bases the questions on the "tourism that we want?" reflects "who we are".

6. Let's see how it was developed

One of the first activities was to know the tourism experiences of the neighbouring beaches. They used three experiences of tourism of three situated beaches on the east coast of Ceará: Canoa Quebrada, Parajuru e Praia das Fontes, the reality neighbouring them; they had established some criteria, as the level of income, the chances of occupation and employment, the degree of social inclusion and the level of crime and use of drugs.

This exercise of comparison that uses some recognized parameters as extraction of positive and negative points, is part of the methodology used by designers for developing a project. In the *similar analysis*, they made comparison between products, services or initiatives, and they look at and analyze specific aspects, for succesfully project a new "product" and take in account the results of this comparison.

The inhabitants of Prainha do Canto Verde had projected a proper design of tourist services, and had decided that the tourism found in these next cases was not the tourism model that they wanted to adopt and had opted, thus, for new a proposal of tourism who were decided from a briefing, to be able to develop the project "the tourism that we want". The instrument of the briefing, another tool used for designers helped, them to define the lines of direction of the desired tourism, in a process of *construction of future scenarios.*

7. What steps and actions

The creation of a cooperative of tourism and handicraft (COOPECANTUR) was an important step in the organization of a community-based tourism. Who works in tourism must agree to be registered in a cadastre as rendering services in the paid cooperative with an annual tax depending on type of service. The services can be collectively or individually explored. The cooperates and the members of the council participate in diverse courses of qualification and seminaries, this has as consequence conviviality. A part of the resources of the cooperative is destined to social and educational causes, so that the resources managed with tourism will not only improve the ones that explore this activity but the whole community.

[4] "Communitarian tourism, or of communitarian base can be defined as one where the local societies possess effective control on its development and management by means of the participative involvement since the beginning, tourism projects must provide most of its benefits for the local communities" (WWF-Brasil 2001, 2).

The similar experiences of tourism in the region had signaled for the importance of the qualification and the education of the community of Prainha do Canto Verde. Diverse actions have been made in this direction, with the support of the Foundation Friends of the Prainha do Canto Verde and the Abrinq Foundation. It deserves a special prominence that a special auxiliary bourse-aid was offered for 15 children so that they could complete the studies in the capital Fortaleza; and the project “Child Constructing” aims to improve the education from the active participation of professors, parents and students.

In the seminary of communitarian eco-tourism, in 1998, it was also decided to invest in tourism of events and courses, constructing and using to advantage spaces and enabling people in realization activities and support of events, including equipment. Today it is an infrastructure that allows to concur a viable and attractive option in this type of tourism.

To extend the lodging capacity and to finance small projects a rotating fund for small loans was constituted, that is managed by the cooperative of tourism and handicrafts. The project wich search to amplify resources is analyzed by the direction of the Coopecantur, and the selected entrepreneurs receive qualification and accompaniment. Some examples of projects with granted loans are: freezer, ice-lolly plant, repairing Tour-Jeep, repair and construction of inns, domiciliary lodging etc. The money returned for the fund goes for new loans and it does not have insolvency cases.

The association of inhabitants possess a small inn that is in charge of the cooperative that paid it a concession, as well as the rent of a store of handicrafts and the communitarian center. The *Bom Jesus dos navegantes* school also receives rent for the use of the conference rooms, refectory, equipment in events, seminaries or courses. With the management centered in the cooperative, with a database on tourism in the community, and with the dissemination activities and contacts made by them, the planning capacity was facilitated and obtains better control to evaluate the impact of the tourism in the community.

The community-based tourism in the Prainha do Canto Verde brought with it a reflection on the importance of the cultural valuation in the community, there had been developed some actions in this direction, such as the book “Our history” for the literacy classrooms and the first series, with the objective to develop a pedagogical material, for the local reality and the local ways of life; the *Povos do Mar* school aims at professional valuation; a choral of children, who present in the festivities and in other localities; the proper sold products in the handicrafts store, where part of the income goes for the library and to pay the judiciary process and the mobilizations. All these projects insert the history, the culture and much more current subjects that need special attention, as the ecological and social questions. These projects and others count on diverse supports, such as the Terramar institute, the nucleus of ambient studies of IBAMA, among others institutions. The proper flow of tourist helps and motivates the cultural valuation, the conscience and auto-self-esteem of the community, with the tourists wanting to know the way of life and its history, its fight and its project.

The ambiental question in Prainha do Canto Verde was given a priority role. The first point to be argued was the pressure on the environment, in the case of population growth. With a young population with an increasing income was the increment of the tourism, the trend was to have, in few years, an explosion in the vegetative growth. With conscience of this fact, an action of family planning was developed interlacing sexuality. Moreover, Prainha did not have basic sanitation and had a gutter less than three meters of the surface. For these problems two projects had been elaborated, SODIS (Solar Water Desinfection) and the use of sanitary vases of compost. It was learned in the communitarian gardening school, to transform organic garbage into natural seasoning, and the communitarian transport (a Toyota of the association of inhabitants) assists in the garbage collection of the city hall. The ambiental question also became present in pedagogical materials and conscientive activities, as the ecological races that occur annually and mention the preservation of the coastal environment.

The small scale tourism organized by the proper community favored this series of actions, that woke the interest, not only of institutions and researchers, but also, of other communities

interested in seeing in close a communitarian based eco-tourism experience. The experience of the Prainha do Canto Verde resulted in recognizing social tourism (among others prize TO DO![5] ,prize "prêmio Criança 1997"[6]).

The fight of the land still continues, but the community already uses some norms for the use and the "sales" (right of ownership) of the land. This story shows some characteristics to us that has functioned as a guide for the process. The main reasons why this project of tourism was constructed are obvious. We are speaking of the participation, the valuation of the context and the local culture, the exchange of experiences, and also, dialogue with other contexts and other actors.

8. What was the result? A new paradigm in construction

> *"In short, the communitarian eco-tourism of Prainha do Canto Verde is inserted in a proposal of integrated and sustainable development, enclosing the diverse dimensions of the communitarian life and of the organization of fishing activities, education, health, environment, and the agrarian question. The tourist activity has subsidiary and complementary function in the economy of the community. It has important role in the conservation of its cultural and natural environment. Fishing and the land `are the identification elements' of the community base. The tourism promoted here is characterized for being developed by the community, organized, managed and operated in cooperative base by the proper inhabitants, and has as distinguishing attribute the declared intention of being today (and remaining in the future) of small scale. Its management is based on the principles of the communitarian auto-regulation"*
>
> (Rocha 2003, 122)

This union and mobilization, the call of external actors and the configuration of a debate and conviviality space has been the bases to create an environmental union internally and of a differentiated relation in respect to the actors involved in the process. The purpose was to develop a proposal from "down to up", the concern was about the well-being of the community and the balance of the ecological way of which it is part. This model represents a new paradigm in tourism and believes that the main innovation inhabits essentially in the type of relations that is possible to live. New standards of relation have been established, they defy the existing standard in the majority of the scopes of society, also in the area of tourism. In first place, it is about new relations between the inhabitants based on contribution, solidarity and in lending aids, for the creation of space of an open and democratic conviviality. This picture definitively opposes the one of individualism and competition that predominates in the majority of tourism experiences. In fact, when the members of the same receiving community are not totally excluded from tourist circuit, they are generally in competition aiming to get more individual profits with the tourism activities. But these new established standards are presented as more "innovative" in relation to the tourists. It's interesting to observe that the tourist in Prainha do Canto Verde is not anymore "the king" who can do what he wants, but opposed to it, has to obey rules, preexistent to his arrival that have been established by the receiving community. These rules represent limits (of use, load, etc.). The tourists, in fact, can live profoundly the day-by-day reality of the community appreciating it approximate to the inhabitants. A relation is made between the members of the community (hosts) and the tourists, which is dialogical in nature, the two find a relation of proximity of a total different type to conventional tourist services, a relation characterized for the

[5] Given by the German NGO of tourism and development studies (www.studienkreis.org).

[6] Abrinq Foundation.

unpredictability and proper singularity of each meeting. This new type of relation established with the tourist is based on an ethical relation between pairs, relations who are based on the respect of the other and therefore, foresees limits and rules, but at the same time leaves space for the meeting and dialogue in it. The majority of the times it becomes a form of cultural exchange, therefore frequently the tourist and the host belong to two different cultures. This type of relation favors and stimulates the interchange of forms of thinking and viewing the world, but also of sensibility and knowledge. This strengthens the value of each culture and increases auto-esteem of the involved actors. It transforms tourism, by means of services, into a meeting place and dialogue between cultures.

9. The design in all of this

Viewing the reflections of the experience of Prainha and the experience of social innovation that it represents, it is interesting to locate service design and to reflect on the possibilities of its role.

It seems that a services designer needs a specific focus on humans and their relations who are constructed by their own means, who have a role of great importance in new estimated developmental bases.

It is important to reflect on the fact that the experience of Prainha is the result of a determined historical context and circumstances, who are cultural and social specified, between a foreseen fight for survival, that mobilized the entire community under the threat of being destructed; the possibility of comparison with neighbouring experiences and at the same time refusals, that made possible a critical reflection on some options of tourism models; the presence of some external, national and international actors that on a side, meant the possibility to have a bigger resonance, and on another side, had the effect to instill more the identity and self-esteem of the community.

All these factors contributed to the case of Prainha, so that it continues being, a national and international reference for community-based tourism.

So it is necessary that service designer works from inside valuing the “experience lived” in each service and stimulating the personal relations of some systems, and stimulating the creativity and the personal interaction, but at the same time it is necessary that it looks inside each service for specific context, fitting it in its culture, looking to perceive and to understand symbolical aspect. This serves to value the differences and to provide a ampler experience, including the stimulation in personal relation, the lived experience and the pertaining dialogical relations in this experience.

Today the services are only utilitarian. The workers of these services are stimulated to fulfill specific, mechanically a script to transforms them into a part of a gear. The worker loses autonomy and is restricted time to use his creativity (Camus 1997). The user loses the wealth of the context in which he lives, seeing only the instrumental and functional aspect, losing to experience deeply that moment (Candi 2007) and that place. Parallel design, if restricted only to the scope of the projectation of objects and to visual communication, can run the risk to lose the vision of all, being worried only about the small “details” and, still more dangerous, finishing in reproducing the logic of the society. In another perspective, service design could be seen, for its sensitivity in relation to humans and his relations while experiencing, the possibility to not only bring for design a ampler vision, but exactly to load a definitive strategic function, namely, one of reinforcement of one determined “symbolic site” (Zaoual, 2006), stimulating the interpersonal relation, breaking the homogenizing cultural structure and extending the plural and multi-cultural character of our daily one.

In the words of Manzini (2007), a designer it could act as “facilitator” of this process:

> *He becomes a process facilitator who acts with design tools to generate ideas on possible solutions, then visualizing them, arguing through them, and placing them in wide, multi-faceted scenarios, which are presented in concise, visual and potentially forms.* (Manzini 2007, 8)

So that it comes to happen that a designer must know to assume a ampler vision, also of contributions in other multidisciplinar areas. The valuation of others, however, needs also to happen in relation to the world of the "silent native", so to speak dialogues in other areas of discipline must be included, so that the dialogue with other actors, carriers , and unspecialized persons, but who will be directly involved in the service. These unspecialized persons, in the case of Prainha had developed a tacit form of "design", showing that the act to project is intrinsic to the human being, independent of its culture and its specific knowledge. It is in this perspective that it makes viable the possibility to co-design, where a designer with his vision and tools can collaborate with the users futures, which are cultural beings with an active role in the society. In the development model where we are living, other visions beyond the one that worries exclusively about the functionality and/or the profit making essentials so that we can change the direction of the way that we are following, knowing that the route that we are taking has generated each time a worsening in the condition of life, of all levels and all classes. A change that helps the society in obtaining an ampler vision, based on dimensions that bring a more humane side. Designer has to assume its part in this challenge, creating solutions, pointing ways, and participating to this collective conscience actively, but knowing that it is only an actor in this process of change. Remembering as soon as the visions and the knowledge of design of services must exceed the limit of exclusiveness of the professional of design, being a base of proficiencies so that, other professionals in other areas of knowledge, and other users, can contribute in the development of more humane and convivial services.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Projecting new forms of neighbourhoods.

The creation of a link between the inhabitants as an answer to changes in society.

Francesca Lanz[1].

Abstract

In the last fifty years in Europe we could observe the end of traditional welfare, the fragmentation of housing's supply and demand, the beginning of a differentiated request that reflects a social situation no longer understandable by traditional criteria. Traditional homogeneity of social classes no longer exist, replaced by melted and coloured social groups. The mixture of cultures, the extension of active life, other complex social and economical factors, deeply will modify the project and the construction of future houses.

Anyway everywhere changes in the family's structure as well as in the ethnic and social composition of the cities demand a change in dwelling spaces.

Interior design is a privileged approach: from interior quality begins the quality of the whole contemporary metropolitan living and the sharing of areas and particularly of services could be a possible answer to the new needs in terms of habitation.

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1. Introduction

«These inhabitants have their culture […] and for inexplicable reasons they are given exactly the opposite of what their "social being " demands in order to survive in harsh and merciless societies» (Kroll 1999, 39)

Even though agreeing on the impossibility of formulating univocal models or identifying ideal dwellings that can satisfy all the contemporary needs of habitation, we can show that on a European level, some general trends can be identified. These trends derive from some common demands formulated within different social groups and cultural areas. The ensuing spatial consequences are heterogeneous and diversified, depending on the geographical environment and the design tradition in which they are formulated and experimented.

The uncertainty concerning the idea of the habitat, as well as of the ways of living in it, remains. In a certain sense, the amount of time that people spend in their houses is increasingly limited, and «the contemporary dwelling- as affirmed by Luisa Bonesio – is a space that ever more precariously disguises its predominant function of hosting, for a few hours, people that spend most of their time plunged in spaces and rhythms of the planetary "Mega-machine", whose law is that of total external appearance» (Bonesio and Micotti 2003, 113). On the other hand, there are still many activities that families carry out inside their dwellings: in the kitchen, meals are prepared, people eat, children do their homework, the family gathers to chat; in the bedroom, people sleep, watch television, read, play, study…

The general demand, for one reason or another, is to have more space, both in terms of more effectively available surfaces, as well as of the number of rooms and functions contained in the house. This demand is common in the middle-high social classes as well as at the level of low cost working-class dwellings. The fact is, in any case, that these activities, which we could define *vital*, remain at the centre of domestic life and are therefore the sources of the demand for space on behalf of the inhabitants. In this way, the *inhabitants,* - those who carry out the etymologically indicated activity of *taking possession of spaces*, making them their own Inhabitant, from the Latin verb *habitare*, frequentative of the verb *habere*: to have, to possess-, are again at the centre of the design reflections in some current experiences of research and experimenting, on a European level.[2]

Those projectual trends, even in the variety and complexity of possible answers, have in common the attempt to answer these emerging needs, placing the human being as an inhabitant at the centre of the action. Here emerges a scenario involving the different (inseparable) levels of the fundamental relationship between man and his environment: from the relational dynamics with space to those with the other inhabitants, up to a direct involvement in the construction of this habitat.

Recalling again the words of Lucien Kroll: «No more shapes, objects, solutions, but urban actions, attitudes of the inhabitants and users, processes, experiences [...] We believe that, in a deliberately complex design, the live complexity could take roots more easily than in objects that anxiously deny its existence» (Kroll 2001, 37).

[2] The contemporary European living scenarios were analysed by the student of Ph.D. in Interior Design of the Politecnico di Milano during a research in 2006. The results of these survey are published in the book by Bosoni, Giampiero and Piardi, Silvia and Manfredini, Manfredo. 2006. Advanced Living Scenarios. Contemporary trends in European housing, Milano: Virus. A widen version of it will be published in 2008 in double languages, English and Chinese.

2. The creation of a network as an answer to changes in cosiety and habitat.

The demand of the inhabitants for more space, consequent to the new and different ways of using spaces, as well as the urge to bring the person back to the centre of the designing process, involves, on one hand, research from the technological and constructional points of view. On the other hand, it involves a re-thinking of the domestic design also from a programmatic point of view.

If the time spent by each inhabitant within the domestic walls diminishes progressively as the complexity of life increases, it is nevertheless true that the activities taking place inside the house are many, and increasingly varied. The recent experiments in the field of integration of working spaces within the residences are the first proof of these changes in the habitat (Farè and Pirdi 2003). On the other hand, changes in the family structure as well as in the ethnic and social composition of the cities, also demand a change in dwelling spaces. This change is however late in taking place and in having effective repercussions in the design process.

The role and meaning of the family in our society have changed during the last decades, correlated to variations in cultural, economical and demographic concauses and elements. Consequently, both the theoretical investigations and the operational interventions are deeply changing. The object/subject "family" is nowadays complex to interpret and difficult to define conceptually, due also to the passage from a plurinuclear and extended dimension to a mono nuclear and restricted dimension of the family itself. From the dimensional point of view, that is the number of components, families composed of one or two persons are on the increase, representing about 60% of all families. For example in Italy the number of family components is progressively diminishing: since 1971, the percentage of one-person families has doubled and nowadays only 57,49% of couples have children[3]; danish families are instead composed on the average of 2.19 people, while 36% of proprietary houses are occupied by a single person, 53% being women[4]; in France, 33% of the population lives alone and 24% are single persons aged more than 50 and 32% are families composed of two people: the average components in a French family are 2.3 persons[5].

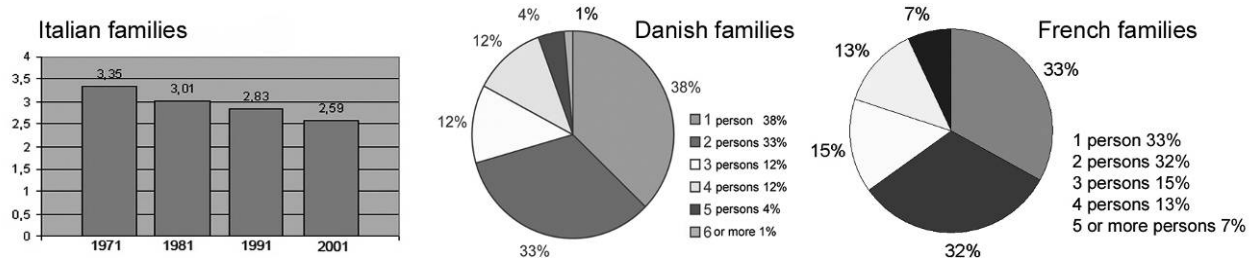

Fig.1: The changing in the family's structure. Components in European family units: Italy, Denmark and France.

As far as composition goes, we can say that the classical "modal" family, that is composed of parents and children, is diminishing, whilst families composed of childless couples and single parent families are on the increase. The presence of a single parent is no longer due only to

3 Italy: data taken from the 2001 census and re-elaboration by Istat

4 Denmark: data taken from *Population and elections, statistical YearBook* document and re-elaboration of the 2002 census by the Danish Government.

5 France : data taken from INSEE *Institut National de la Statistique et des Études Économiques* 2004 concerning the composition of family units.

widowhood, but, increasingly often, to separation of the couple, considering also the marked increase of separations and divorces.

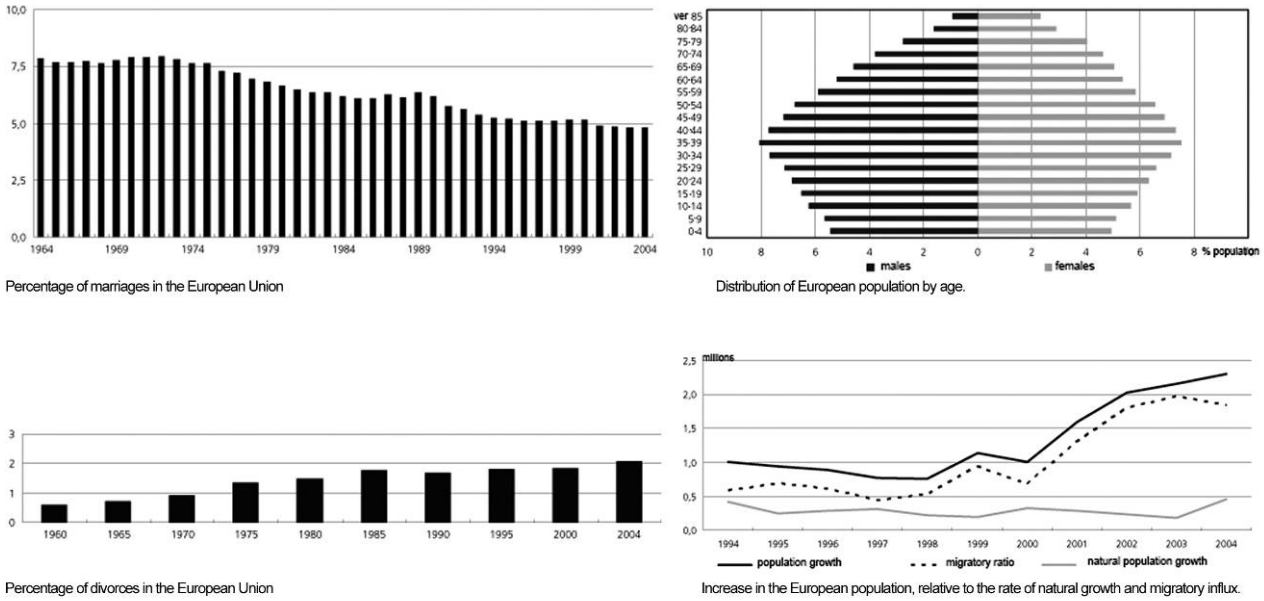

Fig.1: The changing in the european society. The graphs rapresent some of the several demographic and social changes in the making in Europe. Data taken from “L’Europa in cifre” Annual report by EUROSTAT 2006 – 2007.

We must then consider the “other types of family” meaning the abundant variety of family compositions, such as, for instance the “reconstructed families”, the enlarged families, with the presence of elderly people, or the families of persons who are not completely self-sufficient, aided by relatives or assistants.

On a European level it is still difficult to find the variety represented in demographic research, but at a national level, in the most recent census, an image of this situation begins to emerge [6]. If, on the other hand, we search for traces of these changes within architectural design, particularly in interior domestic design, we can today identify the first signs of innovation at a planning level, although, as we will see further on, not yet really formalised from the typological point of view.

The sharing of areas and particularly of services is nowadays one of the main proposals in many European countries, including recently Italy, who see in this a possible answer to the new needs in terms of habitation. Such a proposal allows in fact to increase the space available for the inhabitants, virtually extending the surface of their own house by including the common areas, saving money as well, by decreasing administrative expenses, shared amongst the various owners. At the same time, it can help the appropriation of spaces, and, above all, the creation of links between the various users (Hertzberger 1998) trying to create and stimulate, through interior design, relations and links between the various users of a space or a building. The project thus carries an increased social responsibility, playing a fundamental role in the creation of a *network* of the different actors, indispensable today to face the rapid urban, demographic and social changes in the making.

6 In the recent ISTAT research "Indagine conoscitiva sulle condizioni sociali delle famiglie in Italia”(Cognitive research on the social condition of families in Italy), presented in Rome on the September 20th 2006, for example, it has been necessary to redefine the family, choosing to consider both the officially registered and the “de facto” ones, adopting the criteria of “habitual co-habitation” and the concept of “nucleus” in order to identify, within the family, the subjects linked as couples or by parenthood, because within a family there may be one or more nuclei or none at all. The concept of the “family as an institution” is weakening in favour of the family as a “whole”. The variety of family relations, according to the criteria used for the Census, is divided into “marriage, kinship, affinity, wardship or bonds of affection”. A glossary had to be prepared in order to try and systematise and render comprehensible the new categories introduced.

The cities are constantly growing and their population becomes increasingly heterogeneous; the changes in the family structure mentioned earlier are accompanied by a gradual increase of immigration and by a progressive ageing of the population. At the European level, in about 30 years time, the population aged over 60, considering also the progressive increase in average life expectancy, will definitely be larger than it is at present, particularly if compared to the younger population. This will result in a revisal of the welfare models in the various countries.

What emerges is that the individual is increasingly alone and feels insecure even within the domestic walls [7]. Creating links between people is also one of the possible strategies to prevent social troubles, the development of fractures and the phenomena of social, ethnical or generational ghettoization [8].

Can design contribute to the future of cities? How shall we manage the social, cultural and urban transformations that are taking place, so that they can constitute a veritable resource for the cities and, above all, for their inhabitants?

These questions and considerations, surely of a very general and maybe utopian character, form the bases for some experimentation in the field of interior design focusing on the creation of links between people.

2. The sharing of spaces and services: the Danish tradition and research.

Looking at the European scenario, trends of active research in this field of investigation have been found in the Danish context, which has produced theoretical and experimental results of interest. The research and some projectual experiments are looking for a way to reinstate the social role of the house, going back to some fundamental and traditional themes of Danish residential culture. These themes include the attention for the context and the environment, the relationship between the residential initiatives, the institutions and the local communities, project sustainability and, above all, the concept and practice of sharing spaces and of life in common.

The experimentation concentrates on the attempt to design spaces enhancing social behaviours such as mutual assistance, which foster the beginning of a closer relationship between the users, thus contributing to the creation of a neighbourhood community. These aims are based on the idea that these types of links and dynamics, in addition to improving the quality of life of the inhabitants, have a positive influence from the social and economical point of view. First of all, as we have said, they promote integration, thus preventing and limiting the phenomenon of isolation; moreover, mutual assistance, sharing of goods, services and spaces, brings to a general decrease of wastes and can lower the cost related to the supply of a series of charitable services included in the Danish welfare model (for example, home medical care, elderly assistance, help in domestic chores….). In the specific case of elderly people, this model allows them also to continue to feel a part of the social context. The function of these spaces is then to foster the creation of links between people, and in order to achieve this, the strategies and suggestions are mainly found referring to tradition. In fact, analysing the typical Danish residential models, we find different typologies of dwelling that provide for the sharing of spaces or activities, such as *co-housing*, that was born in Denmark in the middle of last century.

Co-housing was born in Denmark in the ’60s from the ideas of the architect Jan Gumand–Hoyer (Durret and McCamant 1988) and has today spread particularly in the Scandinavian countries, in Japan, Australia, USA and Canada. In Denmark, it is a consolidated dwelling

7 See *Rapporto sulla Sicurezza Nazionale*, Quirinale, 20 june 2007, Roma, Italy.

8 We can unfortunately find many warning sign of this situation: the riots in Paris, the disorders in the Chinese quarter in via Paolo Sarpi in Milan, the current debate in Italy about security, the xenophobic event in South Africa, are just some examples and we cannot refrain from thinking of the recent and rather frequent news reports about elderly people “forgotten” on trains or in apartments in the outskirts of our cities, fights between neighbours that end in tragedy, or of undisturbed armed robberies in the apartments.

typology to the point that it is included in the master plan for large development schemes. In the last few years, the first communities of co-housing are beginning to develop also in Italy. At the basis of a co-housing project there are some common expectations and desires of the future inhabitants, such as the quest for a dimension of sociality nowadays lost in the big cities, the will to rediscover a sense of neighbourhood, a feeling of safety and belonging, and an effort to reduce the complexity of life, the management costs of everyday activities, and the daily stress. The groups of residents are generally intergenerational communities with the presence of singles, families with or without children, and elderly people, linked not by ideology or ways of thinking but by the common choice of living as a community, driven by the desire for a socially richer life. The residents are an active part of co-housing, co-operating in the design of the complex, as well as in its operativeness. They take care of everything together, starting from the choice of the services to be shared, up to the management of the structure and its rules.

Recently, particularly in Denmark and in the USA, senior co-housing (Durret 205) is spreading: structures of co-housing dedicated exclusively to people from 55 years up, who are given the possibility to live in a community with neighbours with whom they can share interests and also structures and social services. The apartments are totally accessible and the common areas are designed so as to offer spaces for leisure and community life, independently of the physical or mental ability of the single residents.

An example is the Mariendaldsvej senior cohousing in Fredriksberg (Copenhagen) by the Box25 architects. It was built in 1993 and the construction was financed by the Pension Fund with some government aid whit the collaborations of an academic team and the professor P. D. Mortensen. Construction costs were $3,200,000 and the rent cost is in the average for new-build flats in Copenhagen; care for the elderly persons is provided by the normal network of nurses and community helpers. The architects paid a lot of attentions to the ecological aspect of the project and they tried to create suitable, safe a pleasant environment for elderly people. Sustainable living features include heat exchangers, solar collectors, passive solar systems and the use of rainwater for toilets and laundry. The buildings are made by red bricks, whit an architectural language that try to keep a relationship whit the surroundings buildings; instead the horizontal and vertical connections have a completely different stile and they are made by steel and glass. It provides 22 individual apartments and several common living areas. Each apartments is fully accessible for users with wheelchair and it’s completely independent; the dwellings have got an high quality finishing, a kitchen, a toilet and, at least, one balcony to provide to every one privacy and quite. The apartments communicate whit the common areas, so it’s easy to pass from a private space to a common one. The common areas are used for several purpose for instance living and eating together, gardening, swimming pool, library and two guest rooms. This spaces have double high, floor to ceiling windows and mobile walls that make the ambient comfortable and flexible. The interior design encourages both social contact and individual space.

The possibility that senior co-housing community could be, under many points of view, a sustainable solution to the problem of the entertainment and assistance to elderly people began to be discussed in Denmark in 1987, after the progressive closure of clinics and old age homes which started in 1985, preferring a system of domiciliary care, surely more accurate and of better quality, though undoubtedly more costly from the public expenditure point of view. Today in Denmark, many communities of senior co-housing are operational and, also in Sweden and in the USA, the number is continuously increasing, with positive results both for the authorities and for the residents, who are generally satisfied by this arrangement (Paulusson 2004).

Anyway co-housing communities are not the only possibility and the attempt to create new forms of neighbourhoods, not just for elderly persons, it’s very strong in Denmark: five years ago Architects 3xNielsen won a closed competition for new buildings on the west end of the porcelain factory grounds in an old industrial area of Valby (Copenhagen). The competition programme called for proposals that would find place for three substantially different functions: a daily-care centre, a senior care centre whit senior care residences and family dwellings. “A city for all ages”, the 3XN’s proposal, was the only project that integrates the different functions in order to make different ages meet: the 3XN architects grabbed the opportunity to integrate the three generations

whit a proposal that would rethink generation blending in the city. One of the discussed issues in Denmark is how the elderly, no longer involved in the working life, still may be a contributing part of society in stead of being hidden away in some care centre, and in Copenhagen, as in many other European cities, a big challenges lies in the conversion of the old industry areas. The different functions were combined in to a single building that reinterprets the classical city block: the complex can be read as two buildings lying on top of each other. Each one is designed for its specific functions and for its special user's group. The two lowest floors have a clover-shaped plan whit efficient walking flows and calm areas without through-traffic: here we can find day care institutions, the kindergarten, senior care residences, senior training facilities, a centre for the elderly and a common house. These spaces are equipped whit several furnished common areas: it constitutes a secure a safe environment for the elderly that try to encourage meetings between the different generations. Then they become a working environment as well, with the need for efficient walking flows as calm areas without through-traffic. The senior residences are fully accessible also for the users whit wheelchair and they have to be independent and they are furnished whit a kitchen and a toilet. The views and the walking flows are project to provide a contact whit the other building's users. The two upper have a block shaped plan, partially column-borne: they lay different kind of family dwellings among which some 2-story apartments. Here is provided more privacy and individuality along with a best views of the city and the units have roof gardens on top of the lowest floors providing the quality that one expects from an urban dwelling. The project won the MIPIM AR Future Award in the 2005.

These examples show us a way for a new possible way of housign.

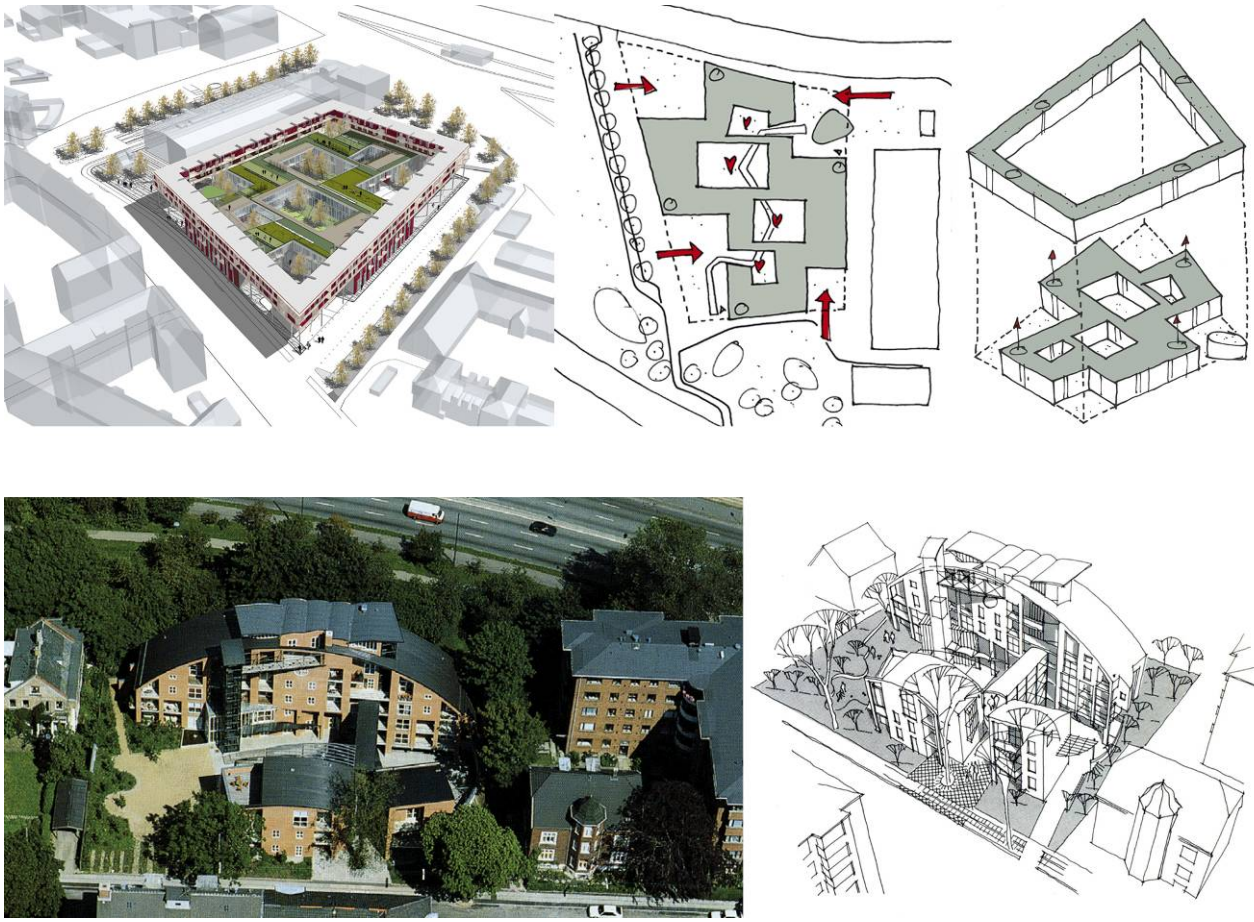

Fig. 3: New forms of neighourhood in Copenhagen. The project "A city for all ages" by 3XNielsen architects and the Mariendaldsvej senior cohousing by Box25 architects.

3. New forms of neighourhood in Beijing: an international workshop.

An international workshop at the Tsinghua University of Beijing in December 2006 provided the opportunity to check the capabilities of these planning approach also in a not European context.

In the last 30 years China, after the important changes in its foreign political behaviour, has become a gigantic mixture of cultures, ideologies and different classes, leading to a very confused situation in which the Chinese are trying to find a right direction for the future. Beijing has been at the center of great social and cultural events. The city was founded about four thousand years ago and, until a few decades ago, has remained virtually unchanged: his life was based on a efficient feudal system and a strong traditional culture. In 1949 the population in Beijing was around 4.2 million, in 2004 it was around 15 million: Beijing has become about 4 times bigger than fifty years ago.

At the rapid economic and demographic development, it is not followed, however, an adequate social development and today Chinese have to face several problems that pain their cities peer to those found in Europe: overcrowding, lack of social integration, need of conservation and requalification of the historical building of the city, demand for greater space and quality services and the will to conserve and recover the traditional values and ways to inhabit and living.

Today, the survival of the traditional houses is threatened from the fast development of the city: houses are demolished or recovered to tourist scopes like museums, restaurants, lodges and, sometimes, luxury houses for rich tourists, loosing their original function and becoming empty symbols of the past.

The Chinese society and the family structure is deeply changing and the traditional houses made by *hutong* (alley) and *siheyuan* (traditional court-yard house for one family) are anachronistic in relation to contemporary needs. On the other hand, high density solutions are too far from the tradition and the sensibility of the Chinese people.

So that during the workshop were asked to the student, Italian and Chinese working together, to develop a proposal to conserve and reuse some traditional houses placed in the historical part of Beijing, making them proper to host 3 o 4 families.

The traditional Chinese family is strictly related whit the traditional house (Gazzola 1999). The hierarchical structure of the traditional family finds immediate correspondence in the organization of the siheyuan where all the spaces are structured in order to accommodate the different members of the family. The inhabitants of the house were linked together by family connections and the perimeter of the house constituted fencing and a protection for the privacy of the inhabitants.

The proposal was the creation of a community of cohousing that involves not only one single siheyuan, but a wider portion of the neighbourhood encompassing the other courtyard houses and alleys, with the intent to create a network that can be expanded, revitalizing this part of the historical city and guaranteeing its conservation. In every house there were small apartments for four different families and several common spaces (guest room, laundry, studios…). The students decided to conserve the structure and the original system of the siheyuan and its main element (the central courtyard, the disposition of the different buildings around it, the surrounding wall and main income…).

While in the past the cohabitation of various persons and different families, in a single siyehuan was guaranteed from the blood link that band together the various inhabitants, today it's necessary, in order to make this cohabitation still possible, that there are new ties between the families of the siheyuan. The idea has been that this link could come from the aware choose to share some spaces and services.

The definition and the analysis of the common spaces and services was a fundamental part of the project. Today in China the distrust towards any kind of sharing is very strong: this is a reaction against the abolition of the private property during the years of the Cultural Revolution. Privacy and intimacy have always been two typical characteristics of the Chinese houses and they are today, above all, requirements priorities for the pekineses families. That's why the definition of the common services and the common spaces to share was not simple and in this phase of project process the different cultural formation of the students has been mainly felt. The result has been a compromise, for which, for example, every apartment has go a small space for the washing machine, while there is a common spaces to dry the wet clothes. The planning of the common areas has had like main objective to provide a better housing standard and quality services for the syheuan inhabitant and for all the neighbourhood.

The thougness has been largely rewarded by the remarkable work of exchanging ideas and comparison of points of view between Chinese and Italian students trying to create a common background and overcome the differences and habits, sometimes stereotyped, particularly rooted in the different cultures of living. It was possible and the result was very interesting.

4. Conclusions.

As we have seen, the European urban scenario is changing, but these changes are not only of a demographic or social kind. In the last fifty years in Europe we could observe the end of traditional welfare, the fragmentation of housing's supply and demand, the beginning of a differentiated request that reflects a social situation no longer understandable by traditional criteria. However very little attention has been paid on that, but nowadays the need of low cost and high quality residences is becoming more and more pressing.

The scenario, particularly focused on metropolitan European areas with high living tensions, confirmed the feeling of a fragmentation that concerns, first of all, people involved in the programmatic actions. Traditional homogeneity of social classes no longer exist, replaced by melted and coloured social groups defined by different parameters that, as some authors claim, can be based on behaviours and constitute contemporary tribes. The mixture of cultures, the extension of active life, other complex social and economical factors, deeply will modify the project and the construction of future houses.

Throughout Europe, with the progressive closing of industries, which started in the '80s and the unavoidable ageing of some areas of the cities, the need to intervene became increasingly urgent, in order to create new trends in the urban texture. This is an important opportunity to re-think many strategies and to develop alternative theories. The quest for a social quality and responsibility of the project is concerned, as well as the attention to the essential aspects of interior design, such as functionality, flexibility, the possibility of rationally furnishing the areas, keeping in mind that the house is a place of personal and social relationship for those who are living in it. It must thus reflect the way of living and daily habits, allowing and encouraging a progressive appropriation of both the internal and external spaces by the user (Farè 1992, 91-111) considering also other aspects of basic importance, such as the social dimension of the habitat, the attention to the context and to the ideals of the community (Keiding 2004, 571; Mortensen 2004, 572-579).

Residential typologies such as co-housing are rapidly spreading in all the European countries, and recently also in Italy. Here, in the last few years, the first experiments are taking shape and the debate about housing is becoming of current interest. Today it is difficult to judge whether this is only an "urban fashion" or whether these models really have a future. Undoubtedly there are many obstacles to be overcome, such as those of the economical type: the cost of these houses is still rather high. There are problems of practical management: the re-selling of the co-housing unit could, within a few generations, forfeit the principle of elective neighbourhood upon which these projects are based. There are also cultural problems: in Italy we do not have a housing tradition linked to sharing, and there still remain very many strong, hardly changeable stereotypes

about the house. Nevertheless, today the response seems to be positive, whilst the spatial effects of these new dwelling types still needs to be analysed. Interior design has the task of creating not only places in which to reside but places in which to live, where it is possible to find a dimension of essential sociality, in order to maintain, also at a larger scale, a more human, liveable and manageable dimension for the cities. The quality of a building is not only a fact of aesthetics, fashion or style, but it is an overall of complex elements, half-way between interior and exterior, private and public, working and domestic… As Hertzberger writes «The central question is the interaction between the form and the users, what they do reciprocally and the way they take possession of one other» (Hertzberger 1998, 115). The quality of life, supported by the interaction of man with the space in which he is living, becomes a fundamental pre-requisite for good living. This concept recalls the definition by Carlo De Carli of "primary space" or «relational space […] a space capable of receiving the body and gestures of man and of corresponding to his material needs» (Ottolini 1996, 87). The interiors are first of all destined to be lived in, used, filled by actions and gestures where the quality, nature and frequentation define theirs being and theirs characteristics. Interior design is considered as a privileged approach: from interior quality begins the quality of the whole contemporary metropolitan living.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Sustainable Development of Traditional Urban Spaces in Wuxi, China

The changing of the road of Zhong Shan (2002-2007)

Jun li[1]

Abstract

Wuxi, as the representative of traditional Jiangnan water town, bears a great deal of ancient vernacular space forms. With the continuous development of urbanization, many new architectural forms also emerge, which are creations of public space in modern Wuxi.

Zhongshan Road lies in the central part of the city. It is nearly 2.14 kilometers long. It virtually inherits many elements from Wuxi's past. Now it is busting with the development of business, tourism and transportation. Inevitably ancient buildings gradually disappear. However, they are still important elements defining the city image.

Constructed space has gained multiple features and will be enriched by human activities, such as traditional customs, events and festivals, which create all the material, ecological, psychological and spiritual health for the space.

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1. General introduction about the Zhongshan Road

Wuxi ,with another name Liangxi and often called Xi for short , is a city in Jiangsu province , Located in 31º07¹of north latitude; Till 32º00¹; ,East longitude 119º31¹; Till 120º36¹, it is in the ,Yangtze River delta hinderland , and the southeast of Jiangsu province. It is to the East of Suzhou, the south of Taihu Lake, the west of Changzhou City, and the north of Jiangyin. With the Shanghai-Nanjing Railway, the Shanghai-Nanjing express highway, and the Beijing-Hangzhou Grand Canal cross downtown area, it enjoys convenient and fast waterway traffic. (lijun 2008.108)

Wuxi once was a famous rice distributing centre and since late 1800s, it has been one of birthplaces of our country nation industry and commerce,. Since 1930s, large number of famous national capital Corp. rise consecutively , such as Mrs. yang , Mrs. Xue , Mrs. rong , Mrs. Tang and so on , and modern times 'nation industry and commerce system has gradually formed, it has become one of the economic centre of southern Jiangsu area.

Wuxi is well known for that her elegant landscape and various humanity landscape, so it is praised as " a pearl of Taihu Lake ".

Wuxi city townsite has not changed all the time during the past 2200, and the city name is also unchanged The old city flat surface pattern appears for "curvature of the spinal column shape " and "one bends nine arrows " patterns. Centre city inner's modern times buildings, the garden villa, the tradition people habitants , historical buildings , and ancient workshop alley has strong history culture atmosphere.

This "one" bow point to the Zhongshan Road which cross the city straightly from south to north.

In the 28th year of Republic of China, the northern part of Zhongshan Road is expanded from the original 3-3.5 meters to 8-10 meters; from Shenglimen to Fengguangqiao the southern part of Fengguangqiao to Nanmen was not expanded. The government permitted broadening south part in 1954. In the august of the same year, all houses along a 1100 road to nanmen were pulled down. In Autumn of 1955 , project completed. The street had been broadened from 3-3.5 meters to 16 meters.

Fill the straight river inside town in 1958 , become No. 2 Zhong Shan Road swith the stone road surface,

Dismantle 208 family commerce houses in 1959, combine No. 2 Zhong Shan Road of 40 meters wide,

1979-1984 , dismantle private houses , broaden the road till 40-45 meters , and formed three pieces plants pattern , 10 meters of fast traffic lane , 5 meters of slow-traffic lane, two 2.5 meters of width green belts , 4.5 meters of width sidewalks.

So far, the entire zhongshan road becomes a 40-meters-wide block... (Fig. 1)

2. The main reconstruction project of the zhongshan road (2002-2005)

Except for relatively rich climatic and biologic resources, Wuxi is scarce of land, water and mineral resources. Besides, it totally depends on the input of other regions for energetic resources.For a long time, due to the heavy defect in this traditional economics and values which boasts that environment resource is valueless. Resources are greatly wasted and environment suffered great damage.

Recognizing the fast deterioration of global environment, and unprecedented urbanization processes in countries like china, it is necessary to incorporate global ecological view into local measures like china and it is necessary to incorporate global ecological view into local measures for improvement of human living conditions. Human settlements must be managed to be health not only for local inhabitants, but for the natural environment and the whole world's ecology, too. This view might be characterized as " both-eye-eco-view".

Change the traditional development pattern totally , renew tradition pattern of consumption , ascertain that science develops idea， construct resource saving type society. (Editor in chief Liren Wang, Wuxi Economic and Social Report in 2006, page 244) The realization of sustainable development depends on the lasting use of resources and the good environment.

Wuxi's development has experienced the process of modern and deep revolution. It needs high quality and high-level development, involving development transition of different levels and different forms.

After stepping into industrial society, science, technology, culture and other soft elements and soft industries take the leading position and determine the development and taste of the city and become the "Cultural City". The upgrade from "City Culture" to "Cultural City" is an inevitable qualitative leap in the evolving process of city culture.

Commercial Street of Zhongshan Road connects south and north of the city, which business, tourism and traffic are very prosperous. It is the aorta of business of Wuxi. It is the commercial street which ranks the seventh in total selling amount of the whole country.

- Historical changes of Zhongshan Road from 2002 to 2007 indicates that Wuxi is gradually stepping into the era of shaping cultural industry and experiencial economy with special cultural connotation and artistic connotation. New cultural industry of Wuxi has made great achievements. However, it is still in preliminary development stage compared with other cities. It is desiderated for preempting the high point in the competition of culture, science and technology, promoting the supgrade of cultural industry, and transfer abundatnt cultural resources advantage of Wuxi into cultural industry advantage.

- to outline the state-of-the-art of contributions that design research is today able to bring to social conversation about the future. The conference seeks to bring visibility to significant results. It will also enable us to make of the conference and its published output a tool able to demonstrate what design research can offer today to help re-orientate the transformation underway.

Significant changes of important areas of Zhongshan Road from 2002 to 2007 are reviewed in the following part, and the real motive for its changing is analyzed.

2.1. Renovation of Gonghuayuan

Ancient buildings on Zhongshan Road are gradually and inevitably disappearing in the recent hundred years. Due to its historical value, ancient buildings are still one of the important elements in determining the image of Zhongshan Road. With the construction of new urban space in Wuxi, the international life style will be further established.

Chengzhong Park on Zhongshan Road was constructed in 1905 and has always enjoyed the good reputation of the "First Park of China". It occupies about 50mu of land, is the important activity place for citizen of Wuxi, and a cultural symobl of modern Wuxi industrial and commercial city. （Xinhua news）

In 2005, Chong-an District of Wuxi conducted "expansion, green increasing and permeation", repaired some acient buildings, rearranged Qiqin Plaza and constructed the East Gate and

garden within garden—“Ziyuan Garden”. Citizen of Wuxi possessed a more elegant and comfortable emerald in the city.

The interconnection and amalgamation of the renovated Gonghuayuan and Chong-an Temple pedestrian street increases the humidity and lowers the of the dust amount of the whole block. Most roofs of the block are constructed into hanging garden. In this way, you can feel the loneness of the park when you are in the block and you can see the prosperous of the block while in the park. Chong-an Temple and Gonghuayuan will be constructed into 4A level scenic region and will take in the most tourists in Wuxi.

- The design of public environment has the features of universality and originality. Each city has its special geological, environmental and cultural elements. Shalang-sakyox wrote in his “City Culture” that human living is not simply operating in and on the city, it also originates from the city and the complicated particularity of city life to a great extent.

2.2. Evaluative Pedestrian Street of Chong-an Temple of Wuxi

As the famous historical and cultural city of Jiangsu, during scientific protection, development and utilization of historical and cultural resources, Wuxi references successful experience and gives off new vitality with the opportunity of intense international communication and the integration of east and west in the 21 century.

The development and exhibition of “Wuxi Business Culture” with the representatives of Chong-an Temple and Nanchan Temple are the best starting point for the development and protection of Wuxi industrial and commercial cultures, and the important way for the protection and development of history and culture. (Editor in chief Liren Wang, Wuxi Economic and Social Report in 2006, page 311)

Chong-an Temple has more than 1600 years of history. It has always been political center, commerical and trading center and cultural center of Wuxi since ancient times. It was constructed in the second year of Xingning in Dongjin (364). During the years of Xian Feng and Tong Zhi in Qing Dynasty, two big fires burnt down most architecture and left a large area of clear space which gradually evolved into the center of folk variety show and local flavour snacks.

In 2005, the new Chong-an Temple pedestrian street was officailly opened. It can be divided into above ground part and underground part. The above ground part takes east-west arranged stores as the main part. With the reconstruction of Shanmen and Huangting and the construction of Chong-an Pavilion, Buddhism cultural axes was formed; the former residence of famous musician Yanjun Hua (Abing) is in this place, too. The 400 square meters sunken plaza is the center of the underground part.

The renovated Chong-an Temple connects the history and the future, integrates traditional culture and modern civilization. With pavilions, small bridges and flowing water, ancient trees and tower shadows, waterfalls and sculptures, world famous brands, traditional brands, local snacks, western-style restaurants, restaurants and pubs, gold and jewellery, ect., it is worthy of the name of “business center, cultural center and green center”. All tourists will come to this place if they come to Wuxi. It becomes one of the four characteristic blocks of Jiangnan which also inculdes Shanghai City Temple, Nanjing Confucius Temple and Suzhou Temple of Mystery.

2.3. Museum of Former Residence of Bangxian Qin

- The protection and development of history and culture, concentration of festival celebrations, conferences and exhibitions, and the mobilization of mass culture are important promoting strategies for the leaping development of cultural industry. The exhibition of cultural celebrities and famous articles bring attraction and

competitiveness for the tourism and performance market. Expansion of cultural facility functions can bring functions of cultural facilities into full play and is the best way for the utilization of these facilities.

The former residence of Bangxian Qin near the commercial center of Zhongshan Road was the residence of Qin's family, and Zhuoru Qin is one of the descendants. From 1916 to 1926, Bangxian Qin and his family lived in the fourth building. At July 1986, people's government of Wuxi announced it as city-level cultural relic protection unit. At October 2002, people's government of Jiangsu announced it as province-level cultural relic protection unit. In 2004, it was constructed into museum of former residence of Bangxian Qin with the requirement of urban development.

Precious cultural relic data displayed in the museum become the education place for celebrities and Wuxi history. Calligraphy and drawing exhibition, memorial activities of Qin's family at this place attract a large number of townspeople. These bring the functions of exhibition, education and propaganda of city culture of the museum into full play.

2.4. The Formation of Cultural Commercial Center of Nanchan Temple

Jiangnan area has business-adored culture and paid attention to culture. Its jungle economy has always been developed since ancient times.

Nanchan Temple is located at the corner of Nanmen Canal at the end of Zhongshan Road. This temple was constructed in Tai Qing Years of Liangwu Emperor of southern dynasty. It was called "Ten Liang Brook Temples, Shouhuishan and Cinanchan" at that time. Later only a Shanmen stone memorial archway with four stone columns was existed.

In 1995, Nanchan Temple was reconstructed surrounding Miaoguang Tower. There were stamps, coins, flowers and birds, and antiques markets in the surrounding buildings. Together with snack and tea houses, temple-style market was formed.

After 2003, relying on Nanchan Temple, Miaoguang Tower, ancient canal and cultural commercial center of Nanchan Temple, the city was developed with the emphases on various kinds of special markets and the development of touring resources of the ancient canal. Local flavor snacks market, stamps and coins market, flowers, birds, fishes and insects market, antique market, book and periodicals market, and craftworks market were established successively. Therefore, business, tourism, ancient temple, ancient tower and ancient canal are integrated and the market is prosperous and flourishes. There are 1000 fixed stalls, 200 temporary stalls in the market. More than 3000 kinds of commodities are traded in this market and the annual trading amount is as high as 100 million Yuan.

2.5. Renovation of Street Space

Creating garden city with healthy landscape ecology is the important embodiment of modern development strategy of Wuxi. As the commercial center of Wuxi, Zhongshan Road radiates central hub of the whole city. With countless tourist everyday, it has the ability to exhibit the image of this city. In cooperation with the strategy of culture-based city, "humanized packaging" was implemented to the entire street in 2007. The purposes are optimizing and upgrading its whole function and creating a city street space with pleasant environment, strong cultural atmosphere, prominent fashion development, and harmonious and unified functions.

Detailed measures are enlarging greening area and constructing a large piece of greenbelt in every 500m; increasing various kinds of greening articles; adding plant landscapes and enrich greening design at open spaces along the street; increasing vertical greening and roof greening

and suitably renovate roof gardens within the allowable load of roofs and external walls of buildings along the street.

Simplify and modify incomplete public facilities, make people appreciate the history and elegance of Zhongshan Road, and perceive the captivating cultural charm.

Classify and treat buildings along the street according to their specific conditions, and form harmonized and unified integral elevation effect through cleaning, maintenance, rendering and renovation;

Commercial Mansion, Hualian Hotel, Liangxi Restaurant, and other buildings with relatively new exterior and modern color should be maintained and cleaned. Jufeng Garden, Huayuan City, Mingzhu Plaza, Yinchun Mansion, New World General Merchandise, Hongyun Hotel, Hengtong Mansion, Shidai Mansion, Chaoyang Mansion, the Second People's Hospital, Babaiban, Huijin Plaza, Jinjiang Hotel, and other buildings which were constructed in recent years with cement coating as external elevation should be cleaned and rendered to give them a new appearance. The external elevation of Lingtong Mansion, Yinlou, Zhongfa Mansion, and other old buildings which were constructed long time ago with ceramic tile facing should be renovated and brushed with latex paint to give them a new appearance. Civil houses at the north of Xingsheng Lane and commercial and living buildings along Shuiqu Alley should be demolished and the plot should be auctioned. The newly construction building style should be in harmony with surrounding environment of Nanchan emple. (Sunansanshi , sunansanshi blog, comment posted February 28, 2007)

Outdoor advertisement and storefront signboard should not affect the integral scale, style and tone of buildings;

Improve lighting engineering of buildings, stores, greenbelts and top identifications of high-rise buildings to make them into a continuous night scenery street.

At least increase 5 green, environmental protection and movable toilets through marketing channel; Make the street environment with humanity and ecological trend。The 2145 meters long Zhongshan Road is the densest street of population flow in Wuxi.

Zebra crossing of footway is made into colored zebra crossing; important road sections and areas (such as bus driveway, etc.) are obviously distinguished with colored road surface.

Mobile vendor scattering points are established on some branches, and they will work from 6 o' clock to 22 and a half. Vehicle, identification, management, charging and service will be unified; Adopt one time warning and second time confiscation management measure for dealing in the street and setting stalls outside the store; Remove and renovate civil houses at the north of Xinsheng Lane, and construct parking lot after dismantling.

Pave colored road surface on bus platform waiting area, install chairs on the bus waiting platform, and realize unification and modernization of the integral effect. During the reconstruction of road surface, environmental protection facilities, guideboard, urban map, etc., supporting facilities of bus platform should be improved.

Increase jiffy stands, each group with the length of 6 meters, and equips narrow flower bed built by wood-like material at the outside.

It is impossible for an elegant urban environment to be without self-contained public information system. The city which is lack of public information system is unsound, which manifests in incomplete functions and weakening city image.

In this renovation, all kinds of indication boards will be uniformly planned and designed with Chinese, English, Korean and Japanese to fully reflect the open city and tourist city image of Wuxi. The style, material and tone of the boards should be suitable with surrounding humanistic environment and regional atmosphere. For example, indication boards at Shengli Gate, Church, and other plazas are adopting bright red color. (South Chinese Wuxi imperial sacrifices temple promotion version block)

Install urban map and electronic map which can be interacted simply with the user at dense population flow places and crossroads.

Increase stainless steel garbage can; Install one garbage can in every 30 meters at prosperous road sections and one garbage can in every 60 meters at not so prosperous road sections. Distinguish disposable waste, recoverable waste and poisonous and nocuous waste, and install spitting facilities with easy to clean material. (Fig. 2)

3. Conclusion

Through 5 years of renovation, scattered cultural relics along Zhongshan Road are connected and combined. Small, scattered and excessive humanistic scenic spots with single function are turned into comprehensive scenic spots. Due to the continuous development of public facilities, sustainable utilization of the ancient city public space is realized.

Many years of renovation of Zhongshan Road provides public space for art and public activities of public recreation. Human activities, such as traditional customs, events and festivals, create all substance, ecology, psychology and spiritual health features of the space.

It is the traditional activities with local features that maintain the special atmosphere and configuration of the street while the large extent redevelopment of Zhongshan Road. It is the process of creating the harmonic coexistence of architectures and streets including its material structures, environments, local traditions, heritages and functions.

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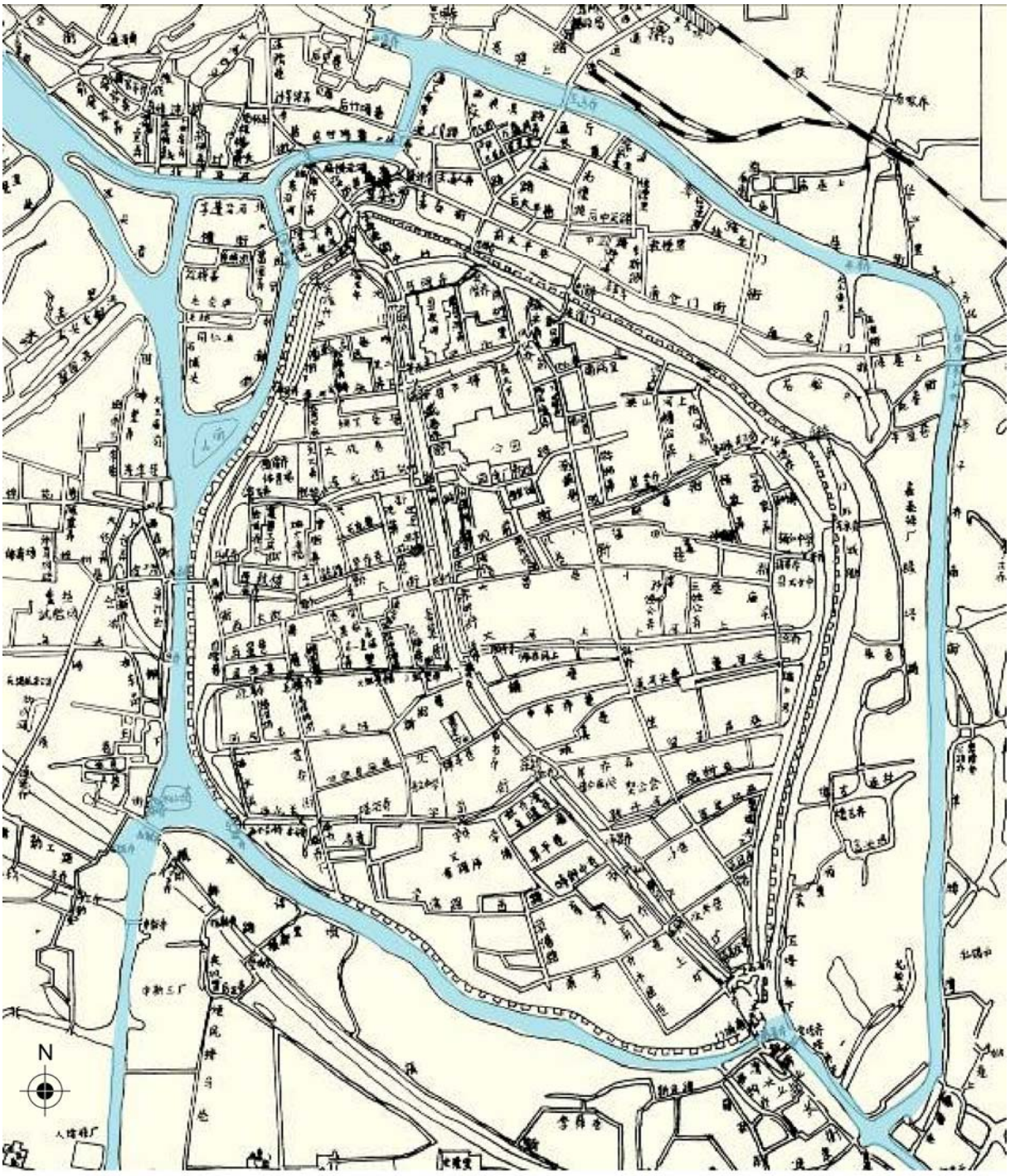

Fig. 1: The map of the old Wuxi city in 1948

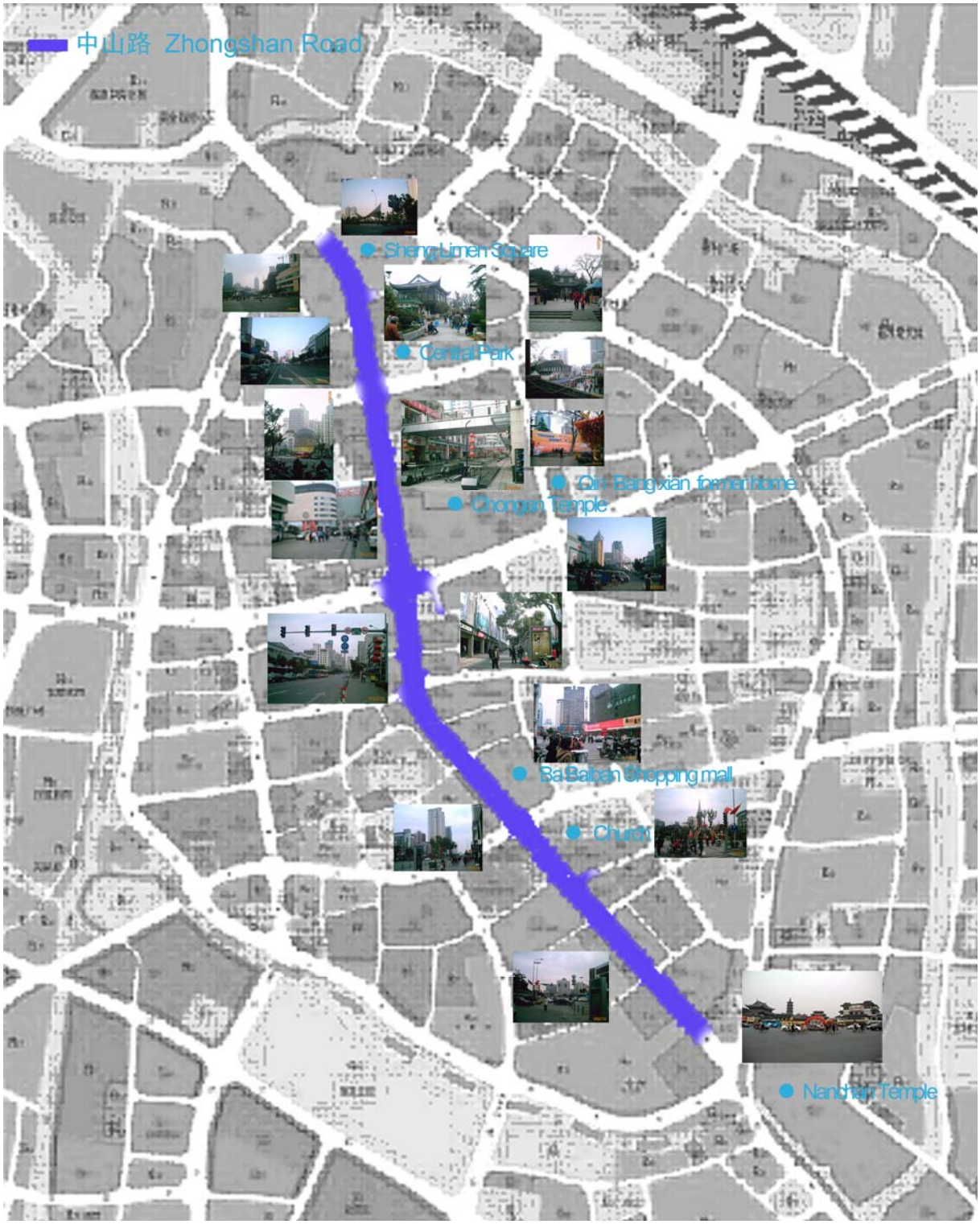

Fig.2: The map of the Wuxi city in 2007

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Breeding cultures of exchange

Can we design our hardware like how we are designing our software?

Thomas Lommee [1]

Abstract

Within design we are shifting our attention from product to process.

We start to acknowledge that a product can only be truly successful if it's embedded within a larger cyclical production process.

We are shifting towards production frameworks, design guidelines that suggest the use of certain materials, assembly techniques and dimensions in order to allow the end product to plug into existing cyclical processes. The designer of the future will be expected to be fully aware of these overarching frameworks and to understand their principles in order to respond to them with grace.

This paper is devoted to these emerging frameworks. It outlines two proposals in which it envisions how these frameworks could manifest themselves and what kind of objects (OpenSource Structures), services (balanced logistics) or even economies (cultures of exchange) it might generate.

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Introduction

The 20th century idea of a seemingly infinite pool of resources gave rise to linear production processes, supply oriented infrastructures and huge amounts of waste.
Today environmental wake-up calls are forcing us to gravitate towards closed product life cycles, infrastructures that balance supply and recollection, and the notion of waste as a resource rather than a nuisance.
These shifts in perception are stimulating us to rethink the way we produce and inspire us to shape our supporting digital, physical and logistical infrastructures accordingly.
Within design we are shifting our attention from product to process.
We start to acknowledge that a product can only be truly successful if it's embedded within a larger cyclical production process.
Within the creative process we are shifting towards production frameworks, design guidelines that suggest the use of certain materials, assembly techniques and dimensions in order to allow the end product to plug into existing cyclical processes. The designer of the future will be expected to be fully aware of these overarching frameworks and to understand their principles in order to respond to them with grace.

This paper is devoted to these emerging frameworks. It outlines two proposals in which it envisions how these frameworks could manifest themselves and what kind of objects, services or even economies it might generate.

A. Optimizing production:

A1.Emerging frameworks

Within our built environment we can clearly identify two sets of frameworks from which new design principles can be derived.
On the one hand we see the emergence of several physical frameworks that advise us on material use and assembly methods.
They suggest to use of only those natural or synthetic resources that can either be infinitely recycled or fully degraded while in the process nurturing, rather than damaging, their surroundings.
As for the assembling part we are advised to restrict ourselves to only those joints and construction techniques that envision deconstruction without damage or loss.

Next to these physical frameworks we can clearly identify several dimensional frameworks, guidelines that aim at unifying the size and measurements of certain objects in order to shape modular systems for the obvious reasons of scalability, flexibility and simplicity.

Overall, the current debate has been gravitating towards the first set of guidelines, towards refining the principles of material use and assembly in order to establish closed resource and component loops.
But what kind of objects or structures would emerge if we would syncronize and refine the existing dimensional guidelines?

A2.Open structures.
Can we co-create our built environment?

This proposal investigates the option of a shared dimensional framework between the most diverse objects in order to generate one common open modular system.

In the past architecture has cranked out countless proposals for modular structures in an attempt to streamline efficiency and enhance structural flexibility. Although these systems represent honorable steps towards a more intelligently built environment we find ourselves today with an abundance of incompatible modular systems that often generate impersonal, uniform structures and a stockpile of fairly useless modular pieces after deconstruction.
So, if we want to improve the concept of modularity in order to generate diversity and enhance flexibility, we need to open up and synchronize our standards. We need to define one universal standard that will allow the broadest range of people to interchange the broadest range of modular pieces and thus reproduce dynamic patchwork structures rather than rigid, monolith blocs.

Since the last ten years we can observe a shift towards shared open architectures within our digital creations. We witness the emergence of accessible and free codes that invite end-users to participate in the development of the source code through an open exchange of knowledge and experience.

But also within our built environment, we should further align assembly and size in order to establish one common modular bloc that will facilitate open exchange and universal compatibility.

We need to distill a kind of physical ‘html’, a three-dimensional open source code from our built environment that will enable us to build our hardware like how we are nowadays building our software.
These universal dimensional guidelines envision closed loop systems where old components feed into new frameworks thus creating an endless variety of open modular structures (from simple cabinets to multistory buildings).
New components will replace old ones whereas old ones can be sold and reused, (or deconstructed to then serve as resource materials for new components, since their measurements are conform the dimensional restrictions). Each structure will thus have the ability to evolve and conglomerate old, new, cheap, expensive, original, bootlegged, manufactured and crafted components over time.

An open modular system will invite everybody, from the most remote craftsman to the biggest company, to design components using their own specific skills, materials and construction techniques within the same dimensional restrictions.
Online component databases will facilitate their exchange since all component designs can be uploaded onto one common component database in order to be discussed, reviewed, certified and traded among their end-users. This vivid exchange of components will stimulate continuous upgrades and allow the parent structures to adapt, expand or shrink according to current needs.

In a local context, components will float in between neighbors, creating dynamic houses within organic 'open' neighborhoods. From a global perspective, one universal standard will facilitate closed component cycles and generate 'living' structures that will stimulate widespread participation through open exchange.

The idea of open modularity isn’t new, our market driven society has already generated several open modular systems whenever their efficiency was able to enhance profit (from stackable shipping containers to standardized kitchens), but if we dig deeper we even find that we, as human beings, with trillions of modules (cells) per person, are modular from head to toe and experiencing the benefits of open modularity every single day.

Modular cell structures enable us to scale and grow, simply by adding new modules - cells - that interact with existing ones using standard interfaces.

They simplify the process of duplication. Duplicating a number of smaller, less complicated cells is easier, faster, and more reliable than duplicating a single complicated one.
Modular cell structures have the ability to rapidly adapt to their environments. By adding, subtracting, or modifying cells, incremental design changes could be more quickly tried and either adopted or rejected.
They are able to specialize the function of the modules. This delegation and specialization of cell tasks provides the same effectiveness and efficiencies inherent in teamwork.
And finally, they enjoy the benefits of fault tolerance. With cell redundancy, individual cells can fail without degrading the system, other cells carry on while repairs are made.

So why not borrow from nature's blueprint and shape our built environment towards an organic, modular puzzle of objects that, from micro to macro, float within closed loops and infinite cycles.

B. Optimizing logistics:

B1. Can we balance distribution and recollection?

The second proposal wants to amplify the first one by connecting it to an alternative logistical model that can facilitate the exchange of open modular components.

Although our total current logistical infrastructure has mastered supply and manicured delivery, it has given very little thought to recollection.
In the best case we sort and stockpile used objects according to material, but the fact that these products weren't designed with deconstruction in mind makes their recycling processes rather inefficient and expensive.
On the other hand manufacturers are discouraged to recycle their stuff since there is no sophisticated recollection system in place and prefer to invest their money in production of new goods.

So if we want to move towards open systems of exchange, where producers are eager to recollect consumed goods and consumers are eager to trade products (or open modular components), we will need to develop a transportation model that can facilitate its logistics, we will need a kind of public service that will balance distribution and recollection in order to guarantee flow.

The following proposal wants to answer this question by outlining a logistical service that gives equal attention to distribution and recollection in order to close material loops and support infinite product life cycles. It wants to do this by crosspollinating the transportation of goods with the transportation of people.

It proposes a fleet of identical (electrical) shuttle busses that connect individual houses with central transfer hubs while picking up and delivering both goods and people.
Much like worker bees circling around a queen bee, these shuttles don't drive along fixed routes or according to fixed time schedules but operate within certain zones (from and to a central train-, streetcar- or underground station) while stopping on demand.

Identical shuttle busses will guarantee a steady delivery and recollection flow within a certain neighborhood.
Central nodes will facilitate their logistical services by expanding from pure transfer hubs towards logistical hubs and service centers.
Companies that can benefit from the logistical services offered by the shuttles (like food/post-order deliveries, recycle/refill centers, laundromats, rental stores etc.) will cluster around these

central stations while underground, streetcar or railway lines will expand their capacities towards the supply and evacuation of goods in order to nurture or flush these hubs.

The integration of pick-up and delivery of both goods and people as well as a constant service flow will offer several advantages for all parties involved.

1. Advantages for the citizen
Citizens can now perform several tasks in one go, catching a ride to a nearby station can now be combined with disposing used, empty or refillable products and packagings (saving them a ride to the closest recycle center).
This quicker connection to the station also enables them to become less dependent on private transportation means to get around.
And next to that, they can rely on the system when sending goods from or to their homes (for example when buying or selling online).

2. Advantages for the manufacturers
In a society where manufacturers will be held responsible for what they produce, this system will enable them to doorstep deliver new products while at the same time recollecting old ones in a fast and efficient fashion.
Providing a context for recollection will therefor stimulate manufacturers to recycle used components and materials in new production lines.

3. Advantages for the government
Government will save costs in both waste management and public transport while at the same time creating new job opportunities and a road occupation that is geared towards public services rather than private use.

4. Advantages for all
Since costs per ride are shared, logistical services will be cheaper for all.
Citizens will enjoy the service of a taxi at the price of a bus ticket (or even pay for a ride with the products they dispose) while both individuals as producers will enjoy a cheap and efficient way to distribute and recollect goods.

To conclude, this system envisions a mixture of public and private transport, of distribution and recollection services, all operating within one multitasking shuttle, a hybrid vehicle that will be monitored and guided by highly refined communication infrastructures while performing complex logistical tasks.

C. Conclusion

Even though both proposals look from a very different angle, one will reinforce the other when combined, because both plug into the same vision and move towards the same goal: a circular society, a society with no drainage but only supply, an open culture of exchange.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Beyond localism, looking for sustainability

Designing "typical knowledge" active-action

Eleonora Lupo[1]

Abstract

It's commonly agreed that every action that is "local" is considered a sustainable action: especially when the concept of local is referred to local resources, local people, local production, local processes and their exploitation.

However, even if with this approach towards local capabilities, behaviors, attitudes and abilities, the local dimension in not a sufficient condition in order to guarantee the sustainability of a design intervention.

This paper aims to discuss and prove which are the real conditions that make the design practices of activating local identities, especially if addressed at enhancing typical knowledge in emerging contexts, sustainable in an intrinsic way, because they take in account these three factors: *ownership*, *control* and *impact*.

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1. About terminology: being local is a process

Being local for a design intervention is not depending by the geographic dimension of an area, but is an approach aiming at making visible and emerging the peculiar characteristics of a context or a place, its milieu and heritage, rooted in places and embedded in people. The local dimension is more a condition than a project scale or ambit, in which the context becomes a design *requisite*, a design *practice* and a design *goa*l.

Local as *design requisite* means to consider the context as a bond and consequently the identity of a place an opportunity of design, taking in account its physical and intangible resources, collective image and social instances: according to Dematteis (1995) “a place is the result of the localization of social facts, values, meanings and relations” and expresses "possibilities already inscribed in the existing things”.

Local as *design practice* means to act in a context and to use situated practices as design methods and tools: the *hodology* (J.B. Jackson, 1994), a word from the Greek one *hodos*, (road, journey), and the *topological psychology* (Lewin, 1936) are practices that define the space lived by humans through their movement within the environment, and make it different from the geometric rationally measurable one. Acting in this kind of “existing” deals with the design capability of exploring, interpreting and transforming a context (physical or social) to make possible to better inhabit and activate it.

Local as *design goals* means to design for a context and its community working on affiliation and relations: the participation of the local community, focusing on empowering its sense of belonging, becomes the aim and not only the modality of the design intervention.

So, being local for design is a *process* based on a replicable approach that will never lead to the same result: the repeatability is not in the forms, but in the rules and method adopted that coordinate and monitor results from time to time to time different, depending on the context, but inevitably bound together by the recognition of local design requisites, practices and goals.

2. Beyond the localisation: territorialisation and contextualisation for the *active-action* of typical knowledge

In this theoretical framework, the paper points the attention in making sustainable the design processes addressed to the exploitation of local cultural heritage. The definition of cultural heritage refers to a complex concept, including both such traditional ambits as architecture, cultural landscape, art & craft, and other often intangible aspects like rituals and social behaviors, values, oral expressions, which are not immediately perceived or recognized as conventional heritage but are fundamental in shaping the form of artifacts, products, structure of society and organization of work, and are in a word, “intangible heritage”[2]. Those kinds of distributed heritage is often not represented or manifested in distinctive or emerging spectacular forms but is a valuable expression of typical creativity embodied in people, rooted in activities and places and can be defined as “typical knowledge”[3].

The typical knowledge is a crucial factor for local cultural identity and a key issue for sustainable development. Intangible cultural heritage is considered “*an invaluable factor in*

[2] The Unesco "Convention for the safeguarding of Intangible Cultural Heritage" (2003) defines Intangible Cultural Heritage (ICH) "as practices, representations, expressions, knowledge, skills - as well as the instruments, objects, artifacts and cultural spaces associated therewith - that communities, groups and, in some cases, individuals recognize as part of their cultural heritage" (Article 2.1).

[3] From now the expression typical knowledge will be used with the meaning of “creativity embodied in people, activities and places”.

bringing human beings closer together and ensuring exchange and understanding among them" (UNESCO Convention, 2003) and can become a dimension for sustainable (social, cultural and economical) development in terms of services, cultural offer and enterprises, being more integrated in a cultural and productive systems connected with the territorial identity (Greffe, 2005).

In other words, a focus on intangible heritage is *context oriented*: the relation with a local context is, for the cultural heritage, a dimension of sense making and value generation. In the same way, the typical knowledge is always localized, which means it is the result of specific local conditions and its experience and use by people will always happen in a specific place and time.

Three are the *local* dimensions of the typical knowledge: *localisation*, *territorialisation* and *contextualization*. The *localization* corresponds to a physical dimension (a place), easily recognizable, where the knowledge has been generated from and which determines its opportunity of fruition and dissemination. However, the context is not considered only as a physical localization, but the natural, environmental, cultural and territorial conditions which determinate the form[4] of the heritage: the link with that context and with its characteristics is important especially in the process of understanding the origins and the nature of the knowledge and its further development.

The typical knowledge is traditional and living at the same time. It is constantly recreated and transmitted and these dynamics makes it evolving and transforming during the time. According to Kirshenblatt Gimblett (2004), the typical knowledge "*is not dividable from the person who owns it and is passed on through performance*" (Kirshenblatt Gimblett, 2004). Through these performances the mutual relation of the typical knowledge with its context evolves in a system of horizontal relations with other heritages and human activities, in a process called *territorialisation*. While the process of localization is somehow natural, the territorialisation is an act of organization aiming at connecting the typical knowledge together and therefore is subject to be designed.

And, in addition, a deep connection with the context is very often for this kind intangible cultural heritage one of the reasons preventing its disappearing. A typical knowledge, for its nature, in order to be preserved by extinction, needs to be continuously performed and socialized: as a performance, it could not avoid, or rather should take advantages from the interaction with the surrounding environment, its dynamics of exchange, production and fruition and should not be separate by them. A typical knowledge usually can survive until it is required by the context where it has originated from: if the context change, the knowledge is destined to became marginal or disappear or to adapt itself to the changed context trying to preserve its specificities. For instance, a typical craftsmanship knowledge survives as a job until it's needed by the market and a clear example is this: in the Nordic culture, the typical wood shipping craftsmanship underwent to a deep transformation when the Vikings finished their sea explorations and this ability needed to find a different application: it gradually turned and specified towards the skill of designing the typical Nordic *stavkirke*[5] in wood.

In the contemporary world, the existence of such typical knowledge and traditions, is not granted for always because the globalisation doesn't help for a proper process of the value legitimating: sometimes its existence leads to underestimate its value, or more often, the act of safeguarding becomes integralism and drives to a static and philological conservation.

Instead, in order to properly preserve a typical knowledge according to its process nature and to the deep and continuous changes of the contemporary world, is necessary to transform and adapt the knowledge, preserving its specificities but integrating it within the changed context or embedding it directly in a new context. The *contextualization* of a typical knowledge is that complex design process that resides mainly in a deliberate reconstruction (physical or symbolic) of a vertical relationship between the knowledge and a context: if is this relation that generates

[4] We refer in particular to the definition which Flusser makes about the concept of form and in-formation, such as generation of models or ideas (Flusser, 2003).
[5] Middle Age church entirely built in wood, typical of Norway.

sense and value, when this link loosens or breaks, the exploitation process tries to rebuilt it or to make it understandable for people, revealing the link with its original place or setting the knowledge in an comprehensible frame and in a proper context for who is experiencing it, linking traditional meanings with new interpretations in a new place of experience, fruition and application.

This is what we call *active-action* of a typical knowledge: it's a *negotiation process*, that considers the typical knowledge a *living entity* that can be *activated in continuity* with its traditional features and meaning, but enabling it to dialog with the contemporary context and innovative applications, finding a new balance between uniqueness and repeatability of its skills, practices and techniques, in forms and numbers of relations which the heritage can face, avoiding any compromising distortion of its nature and the loss of its inner and symbolic value.

3. Sustainable *active-action* factors

It's commonly agreed that every action that is "local" is considered a sustainable action: especially when the concept of local is referred to local resources, local people, local production, local processes and their exploitation. Tha activation of typical knowledge belongs to this logic.

However, even if with this approach towards *activation in continuity* of local capabilities, behaviors, attitudes and abilities, the local dimension in not a sufficient condition in order to guarantee the sustainability of a design intervention. Unfortunately in fact, ever more often, the exploitation of local and typical resources has become an alibi to pursue a pervading model of economic exploitation, moulding informal "economies" previous based on relations and proximity, in structured dynamics of business. If the European Commission (2007) states as necessary the contribute towards local public awareness-raising of the importance of and encourages the social and economic repercussions at regional and local levels, it is because we assist always with more frequency to the application of indiscriminate dynamics of local community spoliation, extraction and expropriation of their values and knowledge, disguising in mechanisms of sustenance or conservation within the global re-productive economic system, those processes of disqualification of their tangible and intangible resources, knowledge and practices[6].

This paper proposes some conditions that make the design practices of typical knowledge active-action (enhancement and valorization) "sustainable". The reflections are articulated around some case studies/projects developed, autonomously or in collaboration with other researcher, during a three years PhD research in design. The PhD in particular considered the ambit of local intangible heritage and typical knowledge and its sustainable exploitation as experimental research practice.

The process developed for the active-action of typical knowledge is defined as follows:

- identification/acquisition;
- conservation/protection;
- transmission/fruition;

The identification phase is fundamental to pursue the awareness of the importance of typical knowledge: to respond to this, we propose a classification of the diverse forms of typical knowledge. They are:

[6] The fashion system is full of examples of traditional production and craftsmanship extracted by its original local context and used at a different global level without any remaining relation with it except than the residual and artificial guaranty of quality coming from the concept of place as "brand". In opposition with this view, any process of extraction of value from a territory should not be separated from a necessary re-appropriation and distribution of that value within the same territory.

- productive knowledge (art and handcraft products, traditional recipes, gastronomic products);
- relational knowledge (celebrations, rites, customs, popular and religious feasts and manifestations);
- riproductive knowledge (art, music, theater expressions, languages);
- knowledge owners.

For the following phases, the approach of activation leads to individuate innovative strategies, techniques and technologies aiming simultaneously to the conservation/documentation and to the transmission/fruition of the typical knowledge, experimenting solutions to spread and to create a sort of distributed knowledge embodied in people and supported by participative and narrative modalities like apprenticeship and interactive technologies.

In this framework, the activation of the typical knowledge can be defined sustainable when takes in account these three "bonds": *ownership*, *control* and *impact*. These three factors are the parameters used to evaluate the sustainability and the quality of the following presented case studies of exploitation. The *ownership* factor defines how much the depositary of the knowledge undergoing the exploitation is involved in the process; the *control* factor estimates the capacity of the owner to manage and decide how and when to use its knowledge; the *impact* factor evaluates the amount of the benefits that the owner receive back (directly or indirectly) by the exploitation process[7]. The impact is not supposed to be measurable economically: it's possible to foster a development in terms of identity awareness strengthening, or knowledge upgrading and exploitation and these impacts are only indirectly connected to an economic development.

As well as these three factors, the activation can follow two different but synergic paths: by one hand there is the experience or fruition of the typical knowledge, which have the objective to make the knowledge accessible and understandable through direct/indirect experience and fruition to a meaningful amount of people aiming at raising its awareness among individuals and communities. A deep comprehension and interpretation of the knowledge should be pursued by activating people participation and collaboration by interactive modalities like story telling and apprenticeship to promote and guarantee the learning and transmission of this intangible heritage through a new human living repository: "*as repertoire is always embodied and is always manifested in performance, in action, in doing"* (Kirshenblatt Gimblett, 2004).

By the other hand the transmission of this typical knowledge can be achieved through the incorporation of such heritage characteristics in new design solutions that include products, services, strategies: this should be designed preserving the knowledge specificities but putting it in a new context of use or application taking in account the continuity with its "tradition".

4. "In search of marginalized wisdom: Sham Shui Po craftspeople"

This research project has been develop in Hong Kong by the *Community Museum project*[8], a cross disciplinary group of researcher (composed by cultural programmers, cultural researchers and design educators) founded in 2002, aiming to explore, through the collection and interpretation of artifacts and visual evidence, *indigenous creativity* and public culture. In their mission "*the word community has three connotations: subject matter, settings and creative public*

[7] The knowledge owner should be aware of the process and benefit from the development generated (Unesco, 2003, Convention for the safeguarding of Intangible Heritage, art.11)
[8] www.hkcmp.org

interface". According to this, the project tried to represent the everyday living and value of the district of Sham Shui Po in Hong Kong, to articulated personal experience and under-represented histories. Sham Shui Po is one of the old district in Hong Kong facing its re-development and it's characterized by numerous small producers, typical cluster of material wholesalers and an emerging design community. It has developed a cultural identity related to a local economy and embodied in local craftspeople, like rattan furniture production, wooden cart making and sewing work. Their craftsmanship, their skills, their operation, space usage and community network reveal an interesting intangible asset that needs to be both preserved and developed. The project aimed at discover and record the local knowledge, creativity and skill tradition of the district that are almost doomed to extinct.

The researcher adopted a situated ethnographic approach of observation focused on the production processes, survival strategies and community relations of eight units of traditional handicraft industries, to produce an exhibition of systematic documentation and explicit visualization of such knowledge: starting from material, resources, tools and procedures it was possible to reaffirm the valuable characteristics of their business operation and how they cope with the limited space and resources. During the research in fact came out that the craftsmanship processes had close relation with the neighbour space and the community: for instance, the mobile stall of Wan Hing Accessories who sells ornaments, beads and related tools and materials always hosts an open air class were the owner, Mrs Kei uses to teach to customers the beading handicraft, transforming her working places in a communal meeting places too.

But it became evident too that the craftsmanship artisan processes are not only a valuable form of heritage but contain important concepts of contemporary design that may become an inspiration for emerging designers and creative industries. So, beside to the collective memory goal, the project pursued the further development "people oriented" of such local knowledge. In April 2007 Community Museum Project started to engage young local designer and older craftspeople in a cross-disciplinary experimental collaboration, with an aim to support with modern design concept the traditional craftsmanship. The activity developed interesting design prototypes that were shown in July 2007.

Yau Kee, a wooden cart production run by Mr and Mrs Lee Dai-yau, developed in more that 50 years of experience an environmental friendly process to realize his carts used mainly by construction workers and cleaners of the surrounding area: Mr Lee Dai-yau uses to transform recycled materials and to collect them established a mutual network with neighbours providing them with a long-life after sale service of maintenance of the cart. The collaboration with the designer Brian Lee leaded to the realization of a transforming cart/table: with a minimal modification of the existing production process it has been possible to design products of wider usage.

Relatively to the sustainable factors, in this project all the collaborations among craftsmanship artisan and designer were based on the same principle: to involve directly the owners of the knowledge in the activation process (they are personally involved in the act of codifying for the designer understanding and collaboration their tacit knowledge and processes), and to positively impact on them (making themselves the beneficiary of a mutual training in which they pass through practices their knowledge and simultaneously learn how to improve it). Finally they maintain the control of their processes without spoiling their capabilities, on the contrary, upgrading their skills and abilities in managing their knowledge and adapting it to new applications and contexts of use.

The kind of typical knowledge undergoing the activation is clearly productive knowledge.

In relation to the activation modalities, this project well mixes and balances the transmission of knowledge achieving it both by enabling the direct fruition and experience (even if for a relatively small groups of young designer) and new applications and incorporation in innovative design solutions. So we can say that the typical knowledge has been territorialized by creating new relations and connections, and contextualized by developing new functions and meanings.

5. Medvoices. Memories of Alexandria, a cosmopolitan city

"Mediterranean voices: oral history and cultural practices in Mediterranean cities" is a project financed by the European Union within the program Euromed Heritage. Euromed Heritage is an international cooperation program whose aim is "*to strengthen and consolidate mutual understanding and dialogue between cultures by the promotion of Mediterranean cultural heritage and public awareness-raising*" (European Commission, 2007). For the European Commission "*the main objective of any program for the promotion of cultural heritage has to be centered on the appropriation of cultural heritage by people themselves and therefore on education and access to knowledge of cultural heritage*". Public awareness comes from processes of education and re-appropriation: "*this objective involves in particular a real meeting of the people concerned with their own successive memories: a true reconciliation, in certain cases, between tangible and non-tangible heritage*".

In this framework the project Medvoices has been addressed to an ethnographic investigation into the cosmopolitan oral and social histories of 13 historic cites across the Mediterranean region, and particular urban quarters within them, through documentation, photographs, literature and interviews that testify extracts of everyday life (rituals, games, celebrations, events) that otherwise would in time be lost. Those cities are Alexandria in Egypt, Ancona, Beirut, Bethlehem, Chania, Granada, Istanbul, Marseille, Ciutat di Mallorca, Nicosia, Las Palmas de Gran Canaria and Valletta and are coordinated by London Metropolitan University.

The project wanted to interrogate the basis of the Euro-Mediterranean's 'common heritage' from an ethnographic and oral history perspective in order to promote an awareness of cosmopolitan and multi-ethnic aspects of Mediterranean area and to encourage respect for pluralism, tolerance and peaceful co-existence. The project challenged the customary emphasis given to 'monumental' heritage to emphasize its relationship to intangible cultural heritage: so the central activity was the creation of a searchable on-line multi-media database of the oral history and cultural practice of the cities in the network[9]. The categories used to organize the resources are: person, living together, work, worship, objects, spaces, play[10].

In this process of documentation the local communities were always considered the owners and performers of the cultural practices and the ethnographic observation has been conducted in a participative and empowering way leading them to reflect upon their own culture and values, sometimes also provoking intense discussion and stimulating further interpretation and socialization of their under-represented practices. So the project increased their awareness and consequently opportunity to manage their knowledge.

The project had a big impact on disseminating and transmitting those collected cultural practices in a wider stage, bringing them to a new audience through seminars and exhibitions and using the website. Thanks to these tools the cultural practices have been preserved from disappearance without any compromising of their specificity because they are continuously re-producible in a technology mediate experience for different users without spoiling the owners.

Concerning the active-action process this project doesn't foresee any new contextualization or application of those cultural practices but will guarantee the learning and transmission of this intangible heritage through the future generation.

6. "ExTra! Exchange tradition"

[9] www.med-voices.org

[10] It is obviously possible to search in the database also by location, language and resources type (audio, video, image, textual document).

The project called Exchange Traditions is part of the European network LabforCulture[11], an autonomous project initiated and hosted by the European Cultural Foundation. The network serves more than 50 countries and its aim is "*to share culture across Europe*". LabforCulture provides a platform for cultural cooperation between Europe and the rest of the world, giving access to up-to-date information and encouraging the cultural sector to become more experimental with on line technologies.

Exchange Traditions promotes the understanding and dialogue between different musical traditions present in Europe by encouraging cooperation between traditions and representing various cultures and minorities. In many parts of Europe, traditional music belongs to the living culture of daily life: it is an important factor for the cultural identity of each individual citizen and represents a valuable form of typical reproductive knowledge. But can be also a "place" to meet different culture: for instance immigrants bring their own musical traditions to Europe; these should be identified, disseminated and protected in the same way as those autochthonous. In activating this typical knowledge the project gives special attention to "cross fertilisation" within different musical genres and on innovative compositions and unusual applications of old traditions, with a special focus on integrating the use of multimedia.

Artists working in the field of traditional music (coming from both a traditional European music and heritage, a non-European musical tradition and an immigrant or cultural minority background) are invited to perform at various places throughout Europe and to participate at collaborative and creative workshops addressed at creating collectively new musical languages.

Relatively to the sustainability factors the owners of the knowledge are enabled to make their musical knowledge interact in a more active context and to transmit it hybridising with new expressions and languages. The beneficial impact they take advantages from is in the opportunity to strengthen a sense of identity more inclusive and cross boundaries.

7. Conclusions

The exploitation process of local knowledge and resources should generate favorable conditions for the community to control, enhance and take advantages, of the heritage they own, avoiding their spoliation. Typical knowledge active-action should be designed considering the safeguarding activity as a complex and integrated process of documentation and fruition, whose result can be assimilated to repertoire of knowledge which takes in account its inclination to be a performance embodied in people. For this reason it should consist in a collaborative process of knowledge sharing between the owner, the designer and the future users, and this involvement is shaped by local culture, attitudes and behaviors. This means that, the exploitation of local resources should use also a context based approach: it is a participative process, rooted in places and embodied in people, which always has a negotiating and local dimension that cannot be easily replicated in another context without any adjustment.

This process of active-action of typical knowledge is not aiming at a passive conservation: in fact it implies the possibility for the local communities to activate "in continuity" their knowledge, but make it evolving, which means enabling the local knowledge to dialog and interact with its contemporary contexts creating new relations and connecting its local specificity with a more global understanding which emphasize its nature and its value and permit its transmission without ambiguous distortions and not proper uses. Vehicles for transmission can be indifferently the design of modalities of experience, fruition and use of the typical knowledge or its incorporation in new solutions (products, services, systems). They both mean the design of an enabling platform, structuring flexible and adaptable (concerning the specificity of different heritages) but repeatable actions (according to the industrial nature of design) aimed at the active-action of the typical knowledge by their owners.

[11] www.labforculture.org

This transition, promoted by the typical local knowledge exploitation, from being aware of their own heritage to its appropriation, develops the capacity of the local communities in implementing their organizational skills in activating a sustainable development leaded by heritage; thus becoming themselves able to deal with its concrete forthcoming integrate management and exploitation.

So, the three parameters of ownership, control and impact will became, together with a context based adaptive approach, the guidelines/reference to support the design of typical knowledge sustainable active-action and re-active-action.

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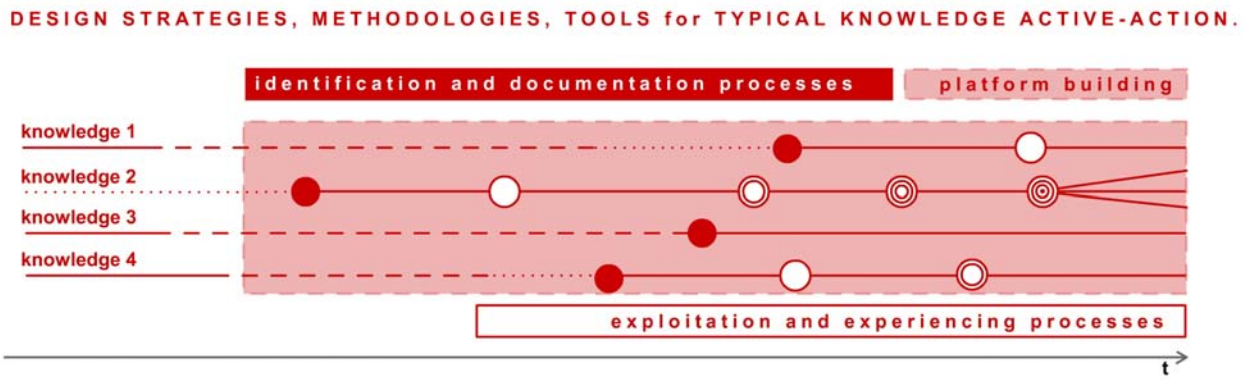

Fig. 1: the design processes of typical knowledge active-action

Fig. 2: the wooden cart prototype developed through the collaboration of Mr Lee Dai-yau and the designer Brian Lee for the project of Community museum project “In search of marginalized wisdom” (in the layout of the final exhibition)

Fig. 3: the home page of the web site of the Mediterranean Voices Project (www.med-voices.org)

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Technoforest

Designing solutions to humanly regenerate ecologically disturbed areas.

Barbosa, João C. L. [1]

Abstract

This paper recollects the story of how a group of designers decided to engage in ecological transformation and to collaborate in the structuring process of societal master lines development. The Technoforest design team is multidisciplinary and includes architects, product designers, illustrators, teachers, biologists, engineers. Due to the subject complexity and the diversity of people involved, Participatory Action Design Research was adopted as a method to develop actions aimed at designing a Technoforest. Geographically the Technoforest would reconnect two Brazilian National Parks creating an ecological corridor that links the coastal Serra do Mar with the higher Serra da Mantiqueira and the Brazilian western central plateau. Humans would dwell in the ecological corridor, participating in its construction, maintenance and development.

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1. Introduction

The Paraiba River Valley is a basin at the southeast of Brazil, linking 3 industrialized Brazilians States: Rio de Janeiro, Minas Gerais and Sâo Paulo. The Paraiba River Basin comprises 55.500 square kilometers and brings water to 14.3 million people (8,7 million in Rio de Janeiro City) and also to industrial companies (steel, chemicals, nuclear) and agribusiness (sugarcane, fast growing tree plantations) located at the valley.

After the Paraibuna and Paraitinga rivers mingle to name it, the Paraiba River comes down from the Serra da Bocaina (a mountain range located at the north of Sâo Paulo that is part of the Serra do Mar). Initially it runs west but, due to a tectonic depression, it changes course towards northeast, forming a valley (50 km wide in average) between the Serra do Mar and Serra da Mantiqueira. After running for 1.120 kilometers, the Paraiba River meets the Atlantic Ocean at the north of Rio de Janeiro.

Originally, the Serra do Mar, the Paraiba River Valley and parts of Serra da Mantiqueira were covered with the luxuriant Atlantic Rain Forest. In and through the forest lived the "tamoyos" (original inhabitants). The forests were crisscrossed with trails designed and kept by the local nomadic population. These ancestral trails were found by the Portuguese and used as roads to link the sea with the central plateau beyond Serra da Mantiqueira (where gold and emeralds existed).

During the XIX century, after the gold mines were exhausted, a new era started at the Paraiba River Valley: coffee plantations. The forest was cleared and the Coffee Barons, using slave work, got rich with the green gold. The topsoil, now without tree coverage, quickly eroded. With the end of slavery (1888) and subsequent economic crisis the plantations disappeared giving way to new industries.

By then there were already railroads and a new road linking Rio to São Paulo. A good urban infrastructure, the wars in Europe and established markets also contributed to a new non homogeneous industrializing boom that led to the formation of the first Brazilian conurbation (between São Paulo and Rio).

Some remote valley areas near the Serra do Mar (and far from the road linking São Paulo to Rio de Janeiro) remained linked to the agricultural past and cities once prosperous became stagnant. These cities were nicknamed as "The Dead Cities", where nothing new seemed to happen. In these municipalities there are great areas covered only with grass for oxen. Being a non labor-intensive activity, cattle growing do not do much to increase job offers and communal development. Unemployment and related problems like drug abuse and violence are serious concerns. Nowadays it is urgent to recover and regenerate the living tissue of the Paraiba River Valley, not only because of the importance of its watershed to bring water to a huge population and to the valley industries but also because the population of the Paraiba River Valley itself is rapidly growing and demanding more of the existing ecological resources. Even the "Dead Cities" are coming out of slumber and growing in population.

As these "Dead Cities" lie at the border of protect areas (The Serra da Bocaina National Park and buffering zones) some of the most promising regional economic activities are related to tourism. Ecotourism, given the natural attractions of the neighboring National Park and historical tourism due to the existence of ancient colonial architecture of the coffee plantation era. In order to reinforce this economical trend the six "dead cities" municipalities organized and manage a joint venture called "The Historical Valley". This consortium develops a series of actions aimed at the improvement of regional tourism and local traditional handcrafts (traditional folk and religious events, local and regional cuisine festivals etc).

In this setting a group of designers decided to start working with Ecological Design and created in 2005 an organization dedicated to this task. What could be the collaboration of this organization to ecologically collaborate to the regional economic development and to the improvement of the local population life quality ?

2. The Green Rooms, ANPED and UniverCidade's Design Research Nucleus

The "Green Room Project" was designed by the Environmental Education Directory of the Brazilian Federal Ministry of the Natural Environment. Its basic aim is to make it possible to small organizations to engage in ecological practice with symbolic support of the Ministry, which provides each green room with a set of books and videotapes. There are already around 400 Green Rooms spread all over the country and they act as local organizations dedicated to the dissemination of socio environmental information.

Founded in 2002, ANPED (Association for the Development of Design Research) is a nonprofit organization dedicated to the development of design research and design education. Its main activities are related to the organization of Design Research Conferences. It has already organized three successful conferences on design research (2003, 2005 and 2007). During the year of 2005, due to the growth of the global Ecological Crisis and also due to specific contingencies like its members capabilities, organizational leadership and political connections, ANPED decided to undertake actions aimed at ecological problem solving. In this sense the organization presented to the Ministry of Natural Enviroment a proposal to create and run the Sertões da Bocaina Green Room (Bocaina's Backcountries Green Room) in the small city of Arapei, located in the poorest area of the Paraiba River Valley. ANPED's proposal included a partnership with UniverCidade's Design Research Nucleus.

UniverCidade is a private university located in Rio de Janeiro and its design course enrolls circa 1.000 students and 50 faculty. The Design Research Nucleus started to operate in 1997 and since then has been engaged in the development of Ecological Design practices. Some of its successful research projects were related to the development of eco friendly materials, the use of Amazon Forest materials as basis to product design, the stewardship and improvement of local natural reserves, the dissemination of eco information through the web and, as a permanent goal, the introduction of sustainability concepts and eco design methods in UniverCidade's design course curricula. The Design Research Nucleus staff is major contributor to the development of Sertões da Bocaina Green Room and has taken part in the design and outfitting of its premises (a multitask room with an area of a hundred square meters). From 2005 on the Sertões da Bocaina Green Room has been developing a series of activities like, short courses, workshops, lectures, business meetings, youth training (as environmental scouts) and the like.

Participatory Action Design Research

Communities of traditional backcountries are very suspicious of people and organizations that out of the blue appear with proposals to solve local problems. They have had enough from ideas not connected to their realities and, based on a history of failed projects, are naturally refractory to outsiders ideas.

In order to deal with this challenging situation ANPED adopted the use of Participatory Action Research (PAR), which proposes the engagement of teams formed by expert problem solvers and representatives of the local afflicted community. We introduced the word "Design" in the traditional PAR acronym in order to state clearly that ANPEDs goals are aimed at responding

to real problems through the design process of problem solving. We do intend not only to propose solutions but also to engage in their becoming a reality, a design product.

In this sense, all activities developed at the Sertões da Bocaina Green Room represent an end in themselves (education) but were also aimed at building a community of engaged partners and volunteers to discuss local problems and advance proposal for solutions. Nowadays, after three years of work, the Green Room team is connected with other people and organizations active in the Historical Valley. The staff of the Green Room also overcame prejudices and conquered the trust of key actors in the Historical Valley.

The Technoforest Project

Starting in 2007, ANPED created a multidisciplinary team composed of industrial, designers, architects, biologists, artists, sociologists and engineers which is presently designing a regenerating project know as “The TechnoForest”. Its purpose is to sow forests in the Paraiba River Valley and concomitantly design and construct villages that mingle and grow together with the forest.

If forests and forest products are valuable assets and if economic growth can lead to the betterment of human beings, why not settle the burgeoning population of the Paraiba River Valley in an economic activity, reforestation, which could on the long run provide sustainability ?

The Technoforest implementation would start between the cities of São Jose do Barreiro and Itatiaia, which are the closest cities (40 kilometers apart) located on opposite sides of the Paraiba River Valley. These two cities are respectively at the borders of the Parque Nacional da Serra da Bocaina and the Parque Nacional de Itatiaia. Also, located between these cities there is an artificial lake that carries water to the Funil Hydroelectric plant and, a major obstacle, the highway that links Rio de Janeiro to São Paulo.

The Sertões da Bocaina Green Room is located in Arapei, a city with 4.000 inhabitants located near São Jose do Barreiro and inside the area covered by the proposed Technoforest ecological corridor. Due to its strategic location, to its record of delivered services, to its connections with other research centers and to its political independency we intend to use the Green Room as the headquarters of the Technoforest project. As a general strategy we divided the project in the following phases:

01) Discussing the idea

02) Building visualizations

03) Committing partners

04) Developing detailed concepts

05) Building a prototype

06) Documenting processes and results

07) Enlarging the partners ring

Presently we are discussing the idea with an enlarged group of participants, refining and documenting the project and at the same time developing visualizations based on the available data (land ownership, topography, demography, rain regime, vegetation etc).

With the documented project and visualizations ready, we plan to find partners among the big regional industries, which ought to be interested in preserving and regenerating the socio ecological tissue in which their economic activities are embedded. A possible strong partners is for instance the CSN-National Steel Company which, if committed, could make available the steel parts necessary to build the basic structure to houses, schools, greenhouses, solar panels, sewage, rainwater collecting and transport systems. This kind of partnership would influence deeply the detailed design of the Technoforest components and the building of prototypes.

The drafts presented are a poetic interpretation of how could the TechnoForest be like. Its structural components includes water catchment, storage and sewage systems, photoelectric arrays, ground and elevated trails, civic centers, social service centers, workshops and lodging. Its main activities would be linked to the services needed to expand the area covered by forest and capitalize on the services thus provided: knowledge, water, fresh air, biodiversity, ecotourism, ecological education, eco design equipment and food producing.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design, Research, Italy.

Maps, visions and perspectives of academic design research in Italy.

Paola Bertola[1], Massimo Bianchini[2], Stefano Maffei[3], Beatrice Villari[4]

Abstract

This paper presents the final results of the DRM Research Project which had mapped all the design research activities realized in Italy (2003-2007) individuating actors, competences, themes, facts through a methodological approach based upon two different research streams:

- a first analytical stream based upon an analytical-quantitative approach in which the research mapped the explicit research activities using direct interviews and questionnaire-file;

- a second stream based upon a qualitative approach developed through a series of video-ethnographic interviews in which the research team build a sort of tacit reconstruction of whole research system.

The result is a report which contains a first vision of what is the nature of the Italian academic research activity nowadays.

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1. Assumptions and objectives of the research

Where is our discipline headed? What does it concern? Which issues does it involve?

These are only a few of the many questions which often come up in conversation between people who are professionally involved in conducting research in design at the university level.

For this reason this research community[5] decided, at the National Convention of Doctorate holders in Design named *Design, Research, Perspectives* (Naples, July 2007), to promote a collective initiative[6] aimed at understanding the nature, size, quality and progress of research in design conducted in Italian universities.

The shared mission is that of constructing a series of *maps*, considering research as a *territory to explore*. From this concept arose the name of the research project: Design Research Maps, aimed at building an initial *geography* of national research and analysing its relationship to the field of education (the Ph.D in design).

The objectives of the research group are:

1 to explore the size, nature, thematic and disciplinary orientation of research experiences and research training (Ph.D.) undertaken by the Italian academic community from 2003-2007;

2 to construct an initial overall interpretation of data obtained from desk research and qualitative research and enrich it with a national and international comparison;

3 to produce an initial series of infographic interpretations, the *Maps*, which visually summarize the composition of the subjects, the characteristic and distinctive themes and relationships, the disciplinary approaches;

4 to work out a critical concept about the overall emerging situation and correlate it with processes of orientation, management and evaluation of the research training activity and the research activity itself.

The DRM research, starting from its initial assumptions, has tried to play a dual role: on one hand, that of an initiative capable of systematizing a variegated view of the research experience; on the other hand, that of a place which gives life and visibility to all those rich aspects and potentialities that the system expresses as a whole, developing methods of narration and language useful for presenting and conversing in different fields: political and institutional, economic and industrial, scientific and cultural.

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[5] The promoters of DRM research project are:

- the *Coordinamento Nazionale dei Dottorati di Design*, which represents the schools of Ph.D. in design in Italy;
- the *Conferenza dei Presidi delle Facoltà di Design*, which includes the faculties and degree programs in design in Italy;
- the *Rete Nazionale di Ricerca SDI* | *Sistema Design Italia*, which is composed of 10 university agencies involved in research in design (www.sistemadesignitalia.it)

This paper is a result of a collective work process of discussion, analysis and elaboration, but the writing of the different parts of the text could be attributed to: Massimo Bianchini (paragraphs 1 and 2), Paola Bertola (paragraphs 3 and 4), Stefano Maffei (paragraphs 5 and 7) and Beatrice Villari (paragraph 6).

[6] *Politecnico di Milano:* Annarita Ancora, Venanzio Arquilla, Maresa Bertolo, Elisa Bertolotti, Mariana Ciancia, Antonella Castelli, Paolo Ciuccarelli, Alberto Colorni, Fiammetta Costa, Luigi Crespi, Arturo dell'Acqua Bellavitis, Silvia Ferraris, Rossana Gaddi, Marisa Galbiati, Gabriele Guidi, Daniele Guido, Manfredo Manfredini, Ezio Manzini, Luca Masud, Roberto Maja, Caterina Marazzi, Walter Mattana, Anna Meroni, Michele Moscatelli, Simona Murina, Francesca Piredda, Raffaella Piscitelli, Silvia Pizzocaro, Simone Porro, Lucia Rampino, Donato Ricci, Dina Riccò, Manuela Rinaldi, Alberto Seassaro, Giuliano Simonelli, Francesca Valsecchi, Pamela Visconti, Francesco Zurlo. *Università degli Studi di Genova:* Niccolò Casiddu, Raffaella Fagnoni, Paola Gambaro, Benedetta Spadolini, Andrea Vian. *Politecnico di Torino:* Silvia Barbero,Luigi Bistagnino, Flaviano Celaschi, Claudia de Giorgi, Claudio Germak, Pierpaolo Peruccio, Paolo Tamborrini, Fabrizio Valpreda. *Libera Università degli Studi di Bolzano:* Hans Hoeger, Kuno Prey. *Università IUAV di Venezia:* Medardo Chiapponi, Davide Fornari, Kristian Koekl , Raimonda Riccini. *Università degli Studi di Firenze:* Laura Giraldi, Massimo Ruffilli. *Università degli Studi di Chieti e Pescara:* Giuseppe di Bucchianico, Antonio Marano. *Università degli Studi di Camerino:* Lucia Pietroni. *Università degli Studi di Roma:* Cecilia Cecchini, Loredana di Lucchio, Antornio Paris. *Università degli Studi di Napoli Federico II:* Marco Elia, Ermanno Guida, Alfonso Morone, Pietro Nunziante. *Seconda Università degli Studi di Napoli:* Sarah Adinolfi, Francesca La Rocca, Patrizio Ranzo, Rosanna Veneziano. *Università degli Studi di Palermo:* Michele Argentino, Vanni Pasca, Dario Russo, Viviana Trapani.*Università degli Studi di Sassari:* Niccolò Ceccarelli. *English translations:* Studio Traduzioni Vecchia and Vanessa Molteni.

Attempts at conducting a systematic analysis of the nature of Italian design were experimented with through the SDI research project *"The role of industrial design in product innovation and the development of planning resources of the Italian system between local resources and global markets"*[7], a systemic research effort which involved 17 Italian universities. Its focus was the relationship between design resources and the national social, economic and productive system. The research built the first important general *fresco* upon the Italian Design System (Compasso d'Oro Prize for Design Research in 2001).

From the point of view of the international scene, the tests performed before starting the activity confirmed the lack of significant studies of the same nature and depth.

Notwithstanding some systematic efforts undertaken by big national institutions which are responsible for promoting this discipline, such as the annual report *Design in Britain* of the Design Council[8], there are no particular acknowledgements even in studies performed by other European and international institutions and centers of design (e.g. ICSID and BEDA).

For this reason it seems important to attempt to take a first look at the question of what constitutes *university research in design*: the goal is that of counteracting the one classic stereotype which says that university research is substantially *academic* research.

Or rather, *done by few, oriented to few* and producing results *that are often little usable* by other entities active in the design field, that is companies and public and private institutions.

Results instead seem to indicate exactly the opposite. University research *is not academic*.

It is multifaceted, articulated by discipline, ranging from macro to micro levels, result-oriented but also able to tackle the big questions posed by the state of our nation.

It is stratified, ranging from basic to applied research, where it is distinguished for its contribution to the development of a competitive strategy of the country, while at the same time paying attention to the trend towards the service sector which characterizes all the advanced capitalist countries.

It is still done by few, but appears to be growing strongly. It is enjoying a fairly healthy state but must be careful of the challenges of globalization.

It has an interesting potential for making contributions and has found its own identity, field and characteristics, in spite of being a recently constituted sector.

The DRM research project is thus more than a fresco, an initial imperfect sketch of what the system of resources and competencies of university research in the field of design is: and this appears to be an initial, important result which deserves to be communicated.

2. The structure of DRM research and the principal areas of investigation

What does working out a map of university research in design entail? How can the data be obtained? How can they be interpreted and represented?

These are some of the many questions which the DRM workgroup posed when starting the project.

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[7] See Maffei and Simonelli, 2002; Bertola, Sangiorgi and Simonelli, 2002; Zurlo, Cagliano, Simonelli and Verganti, 2002

[8] The analysis of design R&D activities in the works of the British Design Council is focused onto professionals and companies. For further details see the Council website (www.designcouncil.org.uk), above all the section *Factfinder*. For the studies realized by other design centers see the ICSID website (www.icsid.org).

The matter of doing research on research in design resulted from the beginning in a fairly precise orientation in the initial phase of setting up the process, the methodology and the research activity.

To create the initial assumptions, DRM research was structured into different areas of investigation which allowed the workgroup to work simultaneously on different fronts, thus managing the complexity of the project; the next step taken started with the identification of the players and the research experience at Italian universities from 2003-2007.

These tasks demanded, as a result of their complexity, the tuning up of a set of operating instruments which allow remote operation and communication with the network of sensors positioned in the universities taken as samples and these are of two types:

1. a detection kit containing guidelines for classification and a data format (chart) to facilitate the collection of information homogeneously shared among the main offices of the relevant universities;

2. a kit for conducting video interviews[9] to be used in order to give a voice and a face to the protagonists of research.

Once the instruments were defined, the operational levels activated included:

1. a census of active entities in this field at the research level (faculty, degree programs, departments) with the relevant disciplinary Ph.D.;

2. a quantitative/qualitative desk analysis (mapping)[10] which identified the characteristics of the university research activity, the typology of the results, the materials produced and the subjects involved;

3. a qualitative analysis of research (interviews) and its mechanisms performed through the collection of internal perspectives of the community of researchers in order to understand the logic, the values, the practices.

These complementary activities, in which more than 80 people participated in different roles, including researchers, teachers, Ph.D. candidates, students and technical-administrative staff, synergistically competed to build an ultimate account which ranges from the description of the subjects to the identification of research experiences and finally to the interpretation and summary of what research in design has produced.

The research was then divided into two different macro areas, or rather, in the investigation of profiles and research activity conducted in faculties and departments and in the investigation of profiles and research activity developed in Ph.D. programs and degree programs and this effort was developed through the following phases (September-November 2007)

1. planning of research and production of instruments for the survey of data and for communication of research efforts (September - November 2007);

2. formal beginning of research activity through survey of data and performance of video interviews (December 2007 - March 2008);

3. validation and organization of data (March/April 2008);

4. reprocessing, interpretation and production of output for the communication of research results (April/July 2008).

[9] The project management for the videointerviews are by Beatrice Villari and Francesca Piredda (D.Com Research Unit _INDACO Dept._ scientific coordinator: Prof. Marisa Galbiati). The production managers for the direction and supervision of all interviews are Elisa Bertolotti, Walter Mattana and Francesca Piredda. Editing and post-production are by Mariana Ciancia, Michele Moscatelli and Simone Porro.

[10] The DRM map project is by Massimo Bianchini and D.Com - Research Unit (Dipartimento INDACO – scientific coordinator prof. Paolo Ciuccarelli). Art direction and infographic design are by Donato Ricci, Daniele Guido and Luca Masud.

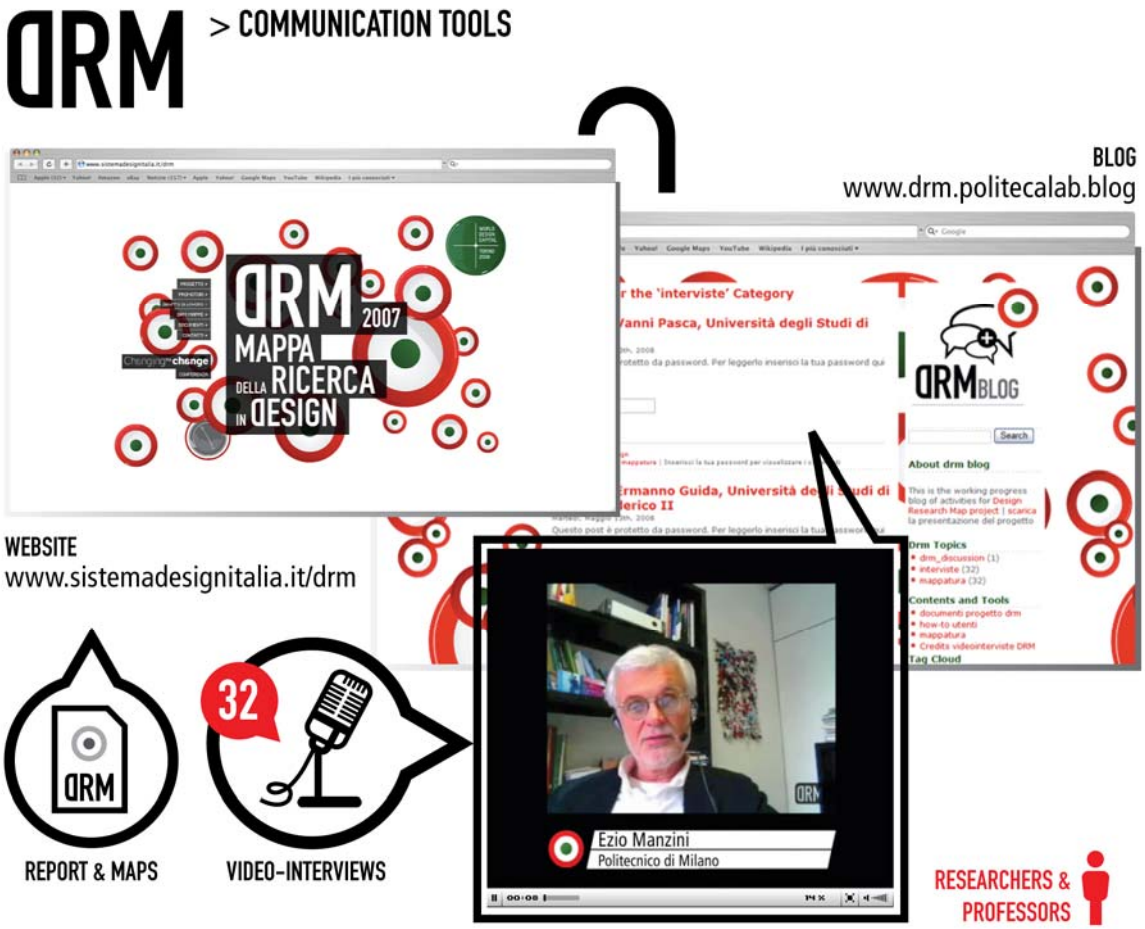

Fig. 1: DRM Communication tools

3. The methodology and the explanatory categories of research

DRM research has favored a methodology able to make explanatory elements emerge following the process of data collection. Efforts proceeded to the classification of players and research at the national level in order then to construct, based on the data collected, explanatory categories which are to highlight the emerging themes and the specificities of the national system.

The research activities taken as samples were thus subsequently interpreted using categories, at times typical of the disciplinary context of design, and at times emerging and transferred from other contexts.

The final result produced a mapping system of research which identified:

- the *nature*, or rather its *applied/planning* aspect, that is aimed at the acquisition of new knowledge of tools and the different fields involved in the activity of design; *instrumental*, that is aimed at the tuning up of methods and instruments useful for planning, or finally *basic/theoretical*, that is aimed at the acquisition of new knowledge of theories, methods and the disciplinary foundation of design;

- the *typology*, or rather the organizational methods of research which include the nature of public and/or private players involved and the relationships between them, their geographic incidence, the level of internationalization and the typology of the results produced;

- the focus, or rather it being centered on specific themes, from those of more common classification inside the academic disciplinary environment of design (Design of products, Design of interiors, Design of communication/interaction, Design of systems/services, Design of material), to categorization used in economic-productive classifications (code of ISTAT-ATECO[11] activity, economic studies related to the geography of the productive sector of *Made in Italy*).

4. DRM categories: a brief and cross-sectional reading

If the categories proposed above anyhow represent a rather traditional model of classification of research, a final level of interpretation is proposed which is created instead from the desire to return to the specificities of research in design in a new way. In the spirit of "Changing the Change" an effort was made to introduce a method of classification of research able to make the role of design explicit as a primary actor in the transformation processes necessary in the sustainable development of contemporary society. This type of categorization organizes research in cross-sectional thematic areas defined on the basis of reading of the summary of strategic objectives of research conducted by national and international institutions as a priority for the future of the human community[12].

The analysis of such different sources led to the proposal of eight thematic areas which represent a summary of the strategic priorities of research both at national and international levels and were used to map the research activities sampled. This method of representation can therefore represent a very effective method of communication, even with interlocutors outside of the specific disciplinary context of design, whose roles may be those of players and often promoters of processes of change and sustainable development. An effort was also made to unhinge the still common conception of design as related primarily to the aesthetic dimension of artifacts and to some specific sectors of application such as the sectors of furniture or textile and clothing in Italy.

The eight categories used are:

-1. New Made in Italy and the scenario of internationalization
-2. Identity, territory and local production
-3. Development of cultural and environmental assets
-4. Urban quality and security
-5. Social inclusion and health services and quality of life
-6. Innovation, industry and hi-tech development
-7. Energy, mobility and environment
-8. Education, training and scientific and technological research processes

[11] One of the classification methods which has been used for the DRM analysis is ISTAT ATECO 2007, in force since Jan. 2008. This classification is the national version of the European NACE rev.2, published in the Official Journal Dec. 20th 2006. For further information see the ISTAT website (www.istat.it). First of all the DRM staff individuated the ATECO codes to define the very nature of design research, applying them to the different research projects. Other codes have then been used to describe the different fields of research activities.

[12] Some of the sources which have been used are:

- the EU 7th FPQ 2007-2013: it defines the guidelines to develop European research activities, in which there are different research topics suitable for design research. The same topics are included into the “Quadro Strategico Nazionale” (national strategic research program) 2007-2013 promoted by the Italian Ministry for University and Research

This program individuates four main fields of activity and ten strategic priorities among which:

- Improve life quality, security and social cohesion;
- Energy and environment: sustainable and efficient use of environmental resources; - Development of integrated production chains and any related service systems;
- internationalization and modernization of Italian productive systems

The categories illustrated above were used to map all the activities of research in design sampled at the national level. This allowed for the elaboration of a new reading of such activities which shows the role that design plays in many strategic sectors of contemporary society, confirming its capacity of being able to promote processes of change even outside of those more traditional and consolidated sectors of application in this discipline.

Fig. 2: DRM Categories

5. The facts and figures of university research in design

The recent conclusion of the campaign of survey and aggregation of data produced a series of reprocessed and interpreted data which is shown below in an important initial summary[13].

The delimitation of the field: who does research in design in the public/private field

The research mapped institutional, public and private entities at the national level which are responsible for training and/or research in the field of design.

The first census was created (Design Directory - MilanoMadeinDesign[14]) which identified 139 subjects potentially active in two fields: University (16), Higher Institutes for Industry and Crafts (4), Academies of Fine Arts + Legally Recognized Academies of Fine Arts (44) and public/private Centers for research and training on design (75).

From this sample, attention was focused on subjects which operate in the university environment (16), isolating the active group (12 subjects[15]) in the field of research and in the field of training and research (14 Ph.D. programs in design active in 9 Italian universities).

In Italy, there is a total of 95 universities[16] in which a nucleus of research is active in the relevant disciplinary sector at each location. Therefore, the sample selected (12 out of 95) represents a significant nucleus. The main universities which conduct research in design is, in fact, 12.6% of the total number of universities which conduct research in Italy and this is a testimonial to the extremely active state of this disciplinary sector.

How many research projects were there in the 2003-2007 period?

Research in the field conducted through direct contact with subjects under examination, painted the first picture of research conducted in the 2003-2007 period, resulting in the mapping of 382 activities of research and 122 Ph.D. dissertations.

Where is research in design conducted? An unbalanced distribution

The first piece of data revealed is the distribution by performer of research activity at the geographic level : the current distribution shows a strong concentration in the north of the country.

76.5% of the research activity (292 out of 382) is performed at 5 athenaeums (Milan, Turin, Venice, Genova, Bolzano) in the north in contrast with 15% of activities undertaken at 4 universities in the Center (58 out of 382) and the remaining 8.5% at 3 universities in the South (29 out of 382).

The first point of comparison is the relationship between productivity in research and the number of teachers/researchers involved in the Scientific Disciplinary Sector of design[17]: only 127 people[18] who represent only 3.2% of the total scientific area of the planning, architecture and civil

[13] The data aggregations shown here are a first interpretation of the work done until now: any later refinement/validation could bring to non significant changes later on

[14] Please also see the on-line publication dedicated to the Lumbard Design Directory project (created by the INDACO Department, scientific coord. Prof. Giuliano Simonelli) within the MilanoMadeinDesign exhibition

[15] From this list of 16 universities the following ones have been excluded: Università degli Studi di Brescia, Politecnico di Bari and Università Telematica Internazionale as they have not provided any information. The Università di Sassari has instead partecipated to the DRM project, but having constituted a research unit only at the end of 2007, they have not developed any research

[16] Source: CRUI Conferenza Nazionale dei Rettori delle Università Italiane: see www.crui.it

[17] ICAR-13 has been regulated by the Italian Ministry for University and Research (see: www.miur.it)

[18] Source: MIUR – Italian Ministry for the University and Research (see: www.miur.it)

engineering sectors[19] (127 out of 3,936 researchers) and 0.2% relative to the whole Italian scientific community (127 out of 62,625). The comparison of data between the number of research activities and the number of researchers shows a productivity comparable to research in all the locations, re-equilibrating the data for differences between geographical areas partly as a result of a dimensional lack of homogeneity. Therefore there is a positive index of an aptitude towards research which is common throughout the national territory.

A strong polarity emerges in Milan however, which also in the university field functions as an important hub of the Italian system demonstrating its propulsive capacity and its existence, in fact, as a *district of design*.

The possible explanations for this phenomenon are various: the presence in the north of entities which have a history, even if recent, are mostly consolidated and part of an economic, social and more vital and competitive cultural community. This is also proved by the strong growing connection that Milan and the other atheneaum of the north have with the local economic and productive fabric (pure applied research[20] represents 48.5%, with 184 research activities out of 382, of which 70% is concentrated in the North, 18% in the Center and the remaining 12% in the South).

Research in design: a growing phenomena

The success of research activity in the field of design is an evident fact, confirmed by the increase in growth in the number of research products.

The total growth curve which describes it shows a decisive increase in research activity by year which seems to have grown at a constant rate in 2006 and 2007, after which the growth seems to stop.

This fact can be partially attributed to the simplification of the survey of data (the 2007 data is partial because it does not consider multi-year research which will be concluded in future years) and also to an actual slowdown in research activity caused by the general situation of normative and organizational transition in Italian universities together with a slowdown in the economic cycle.

The data of the overall trend proves that a university system exists which in a short period was able to grow its capacity of *activating and producing research* for an express demand made both by public institutions and private companies. This includes an offer made by private players in the market documented by the already cited research project *Sistema Design Italia* on the system of Italian design, conducted in 2001 (Compasso d'Oro ADI in 2001).

The financing entities: design between public and private

In Italy, public and private interest in financing design in research is confirmed by the numbers: of the 382 subjects sampled, the total of public and private research activities with public participation (242 research activities out of 382) is equal to 63%, of which 70% is financed by local and national public players (179 research activities out of 242 financed by ministries and entities of research, regions, provinces, municipalities).

This testifies to the capacity of the university in encountering institutional entities: those private (businesses, consortiums, business and professional profit and non-profit associations) attest to about a discrete 45.5% (174 research activities out of 382). Finally, a by no means unimportant 22.5% of the research is financed by a joint effort between public and private entities.

[19] Area 09 Ingegneria Civile e Architettura (civil engineering and architecture) has been regulated by the Italian Ministry for University and Research (see: www.miur.it).

[20] During the analysis phase it has been defined as "pure applied research", without any possible further combination possibilities (that's to say applied + basic research or applied research + instrumental one). For a complete reading of the data see the table concerning the nature of design research.

Taking a look at the projects financed by international entities, a prime characteristic of the system emerges: the degree of internationalization of research in design is not high but almost reaches sufficiency relative to public entities (53 research activities out of 382) with a percentage of 14%. However the degree of internationalization is strongly inadequate in relation to private commissions which dips to a low percentage of 5% (20 research activities out of 382).

Even if it is true that university research in design is new and growing, this is not to be undervalued specially in a phase in which, at least in Italy, public and private investments in research are undergoing a slowdown in terms of resources and tools. If the system wants to be stronger and to grow, taking a look at Europe is definitely necessary.

The nature of research in design

From the primary work of classification of the nature of the research conducted, data emerges which describes how the system is mainly active in the field of applied research with a substantial presence in the area of basic and instrumental research.

More than 48.5% of the research (184 out of 382) is applied, while basic and instrumental research constitute lower percentages, 16% and 11% respectively.

This predominance of applied research shows a critical theme which necessitates greater in-depth examination: the data on applied research indicates on the one hand the capacity of the system to dialogue with private entities and, on the other hand, an increasing difficulty in this disciplinary sector to recognize itself within the normative framework of support of research (EU, national or regional) which is expressly connected to the profile of research offered by the discipline.

It is very interesting to note the data regarding research including multiple categories[21] which delimit an interesting area of demand for research from the point of view of competitive comparison with those entities in the planning sector (centers of public/private research and high level consulting-professional activities). In this case, the university shows an ability to offer competencies, tools and practices in all categories (which altogether constitute a considerable percentage of 52.9%): from *basic research* to that *instrumental*, including all the mixed categories (*basic/applied, basic/instrumental, instrumental/applied, basic/instrumental/applied*)

Even excluding the two pure categories, the percentage value, 25.3%, of the research group in the category of multiple samples, indicates to us a strength of university research in design or rather its ability to operate in different scales and levels of breadth and depth.

A further test performed involved the attribution of research activity using the general classification ISTAT[22] (activity code ATECO/NACE): this resulted in an interpretation of research activity in design from the *official point of view*: the results are the following:

[21] That's to say which includes multiple categories.

[22] The ISTAT ATECO Code (aligned with the European Code NACE) provides us with these categories through which design activities can be interpreted:

Code 70. Activity geared towards companies and management consulting (…) - consulting in marketing management; analysis and formulation of a marketing strategy, formulation of policies regarding customer service, price, advertising and distribution channels, design etc. (…)

Code 71.11 Activity in architecture studies

Consulting activity in the architectural field: planning of buildings and implementation of plans, urban planning and landscape architecture

Code 72. Scientific research and development. This includes three activities: 1) basic research: experimental or theoretical work carried out mainly for the acquisition of new knowledge on the foundation of phenomena and observed facts, not aimed at a specific application or use, 2) applied research: original work performed for the acquisition of new knowledge and aimed mainly at practice and specific application, 3) experimental development: systematic work, based on existing knowledge acquired through research and/or practical experience, conducted with the aim of producing and developing new materials, products and devices, installing new processes, systems and services and substantially improving those already produced or installed.

The research activity and experimental development, included in this area, are subdivided into two further categories: natural sciences and engineering; social sciences and humanities.

1. 62 research activities labelled only with the code 72. Scientific Research and Development and related to basic research;

2. 184 research activities labelled with a set of codes (58,59,62,70,71.11,72,74.10.1,74.10.2) which interpret the various typologies of applied research at the disciplinary level;

3. a hybrid area composed of 136 research activities which combine code 72 (+ one or more codes among 58,59,62,70,71,72,74.10.1,74.10.2) and correspond to the sum of instrumental research activities and those in which there are various combinations among the typologies.

The disciplinary areas of research in design

Traditionally it has been thought that design (and research in design) refers to and aims at stimulating innovation in processes of conception and production of industrial products. Definitely, this could still be considered to be at the heart of our discipline even if the data surveyed by research proves that the disciplinary perimeter is by now much more evolved and mixed. The data definitely show that the evolutionary path of articulation and specialization which the discipline has completed in the last fifteen years has brought to light a complex and advanced disciplinary geography.

Indeed, we can affirm that acknowledging that a strong concentration of interests lies in the field of *product design, fashion design, design of materials and components* (44%, 169 research activities out of 382), design has increasingly turned its attention towards new territories which range from the *design of environments* (13%, 48 research activities out of 382) to that of *design of communication and interaction* (19%, 74 research activities out of 382) and finally to the area of *strategic design* and *services design and design of complex systems* (23.5%, 90 research activities out of 382).

This presence of disciplinary diversity certainly represents a strength of the system which testifies to the capacity of university research in not passively overlapping research practices and professional projects which are still centered on typical Made in Italy sectors to a large extent.

The first interpretative categories

The DRM project was also an opportunity to perform the first test of the vision and direction of the design system (but perhaps also of the productive system with which it interacts), or rather of the capacity of research in design to predict new themes and new answers with regard to the major themes of contemporary living and the economic, social, cultural, environmental challenges

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Code 74.10.1 Activity in fashion design and industrial design

- fashion design for textiles produced, articles of clothing, footwear, jewellery, furniture and other articles of decoration and fashion, as well as other articles for personal use or for the home
- industrial design includes all the activities aimed at the creation and development of plans and technical specifications in order to facilitate the use, increase the value, improve the aesthetic characteristics of products. Also included are the definition of materials, mechanisms of functionality and the choice of shapes, colors, external finishing of products. These activities may be performed taking into account aspects of human characteristics and needs, security, market interest and efficiency of production, distribution, use and maintenance.

Code 74.10.1. Activity of graphic designers

Graphics in advertising and websites, illustrators (given the relevance of present activity, this category is detailed in the activity of graphic designers of websites and in other activities of graphic designers).

Code 59. Activity in film production, video and television programs, musical recordings and audio

Production of film, video, television programs (television series, documentary etc.) or TV advertisements

Code 62. Production of software, information technology consulting and related activity

This area includes the following activities, aimed at supplying specific services in the information technology sector: writing, modifying, verifying software and assisting with software; planning and designing of information systems which integrate hardware, software and communication technologies; on-site management and use of information systems of clients and/or facilities for the development of data and finally other professional and technical activities related to the information technology sector.....

of our society. In order to perform this exercise of orientation and discovery, a classification of general thematic areas was used, those defined as DRM categories in the methodology constructed for this study.

The initial results find the university system mainly occupied with the sustaining processes of renewal of the national manufacturing system, today particularly at risk due to globalization, working on the development of the *new Made in Italy* and defining future *scenarios of internationalization* (36%, 137 research activities out of 382).

This data is particularly important if we analyse the close connection of this first area to research which is part of the category involving themes of *innovation, industry and hi-tech development* (about 10%, 37 research activities out of 382).

Almost half of the research activities sampled are part of this research area indicating, this time in a non-rhetorical way, the capacity of the university system to strongly contribute to issues involving the competitive productivity and economics of the country (the figures of applied research in the categories 1 and 6 surpass 60% with 110 research activities out of 174).

In these two areas, an array of research systems are present which include universities, institutions and companies, aimed at technology transfer, cross-fertilization among sectors, diffusion and exchange of best practices in order to stimulate innovation in and competitivity of companies, specially PMI, through the use of research in design.

The two macro themes in which research in Italian design is making a fundamental contribution in terms of exploratory research even at the international level, involve *territorial identity and local production* (7.6%, 29 research activities out of 382) and *development of cultural and environmental assets* (7.9%, 30 research activities out of 382). These themes, which open new disciplinary frontiers such as that of *design on territorial scale or for local development* and *design of cultural heritage and activities*, have seen this disciplinary research involved in experimenting with instruments, pilot programs and initiatives which favor alternative methods of development in slowly developing local areas and their resources (food farming industry, tourism and hospitality, neo-craftsmanship).

Connected to the two preceding ones to a large extent, there is the category of *Energy, mobility and the environment* (11.5%, 43 research activities out of 382) which sees the theme of design for sustainability involved in the redefinition of new models of consumption and creation of assets and services with low environmental impact and in identification of systems of sustainable products/services for the management of energy resources and of mobility trends of people and products.

The presence of DRM categories related to social *Inclusion and health services and quality of life* (4.5%, 17 research activities out of 382) and to *urban Quality and security* (3%, 11 research activities out of 382) is also important. Here, research in design is taking the first steps in finding innovative solutions to problems related to disability and to facilities and services for the treatment of people, but also to new issues related to security and quality of life, specially in metropolis and its work places.

Finally, there is the peculiar but important survey of the category *Education, training processes and scientific and technological research* in which the system offers an advanced thought process on methodological, instrumental, operational approaches applied to learning and research processes (12%, 47 research activities out of 382) .

Methods of disseminating results

A final related piece of data which better focuses on the difference between private research-consultancy and university research is that connected to scientific production which originates from research activity. The main data shows that the output of research in design can be divided in different categories and that 96% of the research mapped produced results in at least one of these categories.

In 55% of cases, the research activities sampled brought forward new concepts of assets or services for the development of the relevant project, in 39% of cases, they resulted in the concrete creation of new products, both as artifacts (or systems) which are material and/or non-material. Research in design conducted in Italian universities shows a certain aptitude for know how to do with a clear matrix and vocation for planning practices, both theoretical and applied, with a concrete capacity for translating ideas and activities to a tangible, marketable output.

Research in design is also characterized by its ability to know *how to think*. Almost half of the research conducted (189 out of 382) resulted in the development or refinement of a methodology, thus testifying to a capacity for codifying, modelling and reconfiguring the experiences had and the knowledge accumulated, thanks also to the variety of situations and entities with which relationships were entered into.

As far as the dissemination of the results, a peculiar characteristic of research in design emerges, that is communicating and spreading not only through traditional instruments such as publications and conventions (52% and 24%), but also through instruments such as seminars or production of info-communicative material (18% and 34%) which are perhaps less academic and more informal, but perhaps more in tune with the necessity for the communication of the results of research in design.

6. The facts and figures of the Ph.D. in design

Nature and structure of the Ph.D. program

Among the 16 universities sampled by the DRM project, 9 provide a Ph.D. program in Design making a total of 15 Ph.D. programs active in the national territory. Of these, the Politecnico di Milano offers 4 Ph.D. programs, the Politecnico di Torino offers 3 making a total of 15 Ph.D. programs active in the national territory, of which one is constituted in collaboration with Seconda Università degli Studi di Napoli and Università degli Studi di Firenze.

In the 2003-2007 period, among the universities considered, there were 8 Ph.D. programs already completed: of these, 5 are present in the north (62.5%), 1 in the center (12.5%), 2 in the South and in the Islands (25%). The Ph.D. programs considered actually have a recent history. Within the Italian panorama, the first Ph.D. program is that of POLIMI founded in 1990, followed by that at Università degli Studi di Palermo in 1991. Of the 15 active programs not yet concluded, there are those instituted by Università degli Studi di Genova, Università degli Studi di Firenze, Università degli Studi di Camerino and that initiated in collaboration with the sites in Florence and Naples.

In general, every Ph.D. program pertains to a Department of a different nature, in which the area of Design is integrated in some cases with those of Architecture, Technologies and Figurative Arts also because, historically, the activation of a Ph.D. program in Design was in Departments connected to the Faculty of Architecture.

This *productive* relationship between Design and other disciplines obviously has an influence on the thematic nature and orientation of Ph.D. programs put in place and affects their results. In this sense, the relationship with disciplines of Architecture is strong also for historical reasons and is the one more commonly found within Ph.D. programs in Design in Italy.

Didactic structure

The method of organization of internal didactics, for Ph.D. programs under consideration, may be subdivided into two big categories:

- *didactic organization with tutorship*, or rather a training model which predominantly provides a learning path based on the close relationship with reference Ph.D. candidates and teachers (Tutor), together with whom the Ph.D. candidate decides on the training course and research;

- *structured didactic organization (by coursework)*, or rather a model which provides a Doctorate program organized by specific Courses, which also have value in terms of earning credits.

The first model is followed by Università IUAV di Venezia, Università degli Studi di Firenze, Università degli Studi di Roma "La Sapienza". The *structure by tutorship* also characterizes the joint Program between Florence and Naples, while the other universities follow a didactic structure organized *by coursework*.

For the universities which adopt a *structured didactic* organization, diverse training offers have been identified subdivided on the basis of the nature of the program. It is seen that of the 8 universities considered, all offer *preparatory training*[23] and 6 have *basic training courses on research*[24] *and specialized training on research*[25]. Only 3 provide basic training courses on research.

The overall model which emerges is thus still dual: on one hand a training course which actively involves the Candidate within the academic structure with his/her participation in learning activities which are institutionalised and integrated in his/her own curriculum, and on the other hand, a training course in which the Ph.D. candidate predominantly learns thanks to the *maieutic* relationship and meetings with the reference Tutor and the scientific community. It should however be underlined that the clear predominance is of structured training in national Ph.D. programs organized within the Doctorate programs (11 out of 4). This means that for research activity, commitment and active participation at the site and in meetings with the scientific community is demanded from the Candidate.

The figures of the Ph.D. program

To understand the relationship between the number of Ph.D. programs in Industrial Design and national programs, data obtained from the site of MUR were compared to those obtained from mapping. The national sample for the 2003-2007 period shows 13,903[26] candidates in the total disciplinary area of research. Of these, the *average number of Doctorate candidates admitted each year* in the area of Design is a medium number of 66, of which about 7.6% is composed of foreigners[27].

Starting from the founding year of the first Ph.D. program in Industrial Design, the total number of candidates who enrolled was 220. Considering the 2003-2007 period, this sample is reduced to 116 candidates who were given the Ph.D. in Industrial Design.

According to geographic distribution, it is found that 70.7% of research takes place in the North, 6.9% in the Center, 22.4% in the South. The 116 dissertations considered are subdivided

[23] by *research introductory education* we mean those courses tipically linked to design disciplines

[24] by *research basic education* we mean those courses which aim to supply Phd students with the basic tools and knowledge

[25] by *research specialist education* we mean those courses which aim both practical research production and activities and research observation to

[26] Data integration 2003-2006 (source http://statistica.miur.it)

[27] Universities which declare that the participation to foreign Phds are Politecnico di Milano, Università degli Studi di Genova, Università degli Studi di Camerino. On these data we are not in possess of any pieces of information about the students' nationality. It would be interesting to understand if specific grants for foreign candidates are available, in order to clarify if the partecipation of foreign members is somehow directly encouraged.

as follows: 77/Politecnico di Milano, 18/Università degli Studi di Palermo, 8/Università degli Studi di Roma "La Sapienza", 8/Seconda Università degli Studi di Napoli, 4/Politecnico di Torino, 1/Università IUAV di Venezia. The number depends on the number of active Doctorate programs in each of the academic sites and on the related establishment. However, it is seen that Politecnico di Milano with 3 related programs sampled represents by itself 66.4% of the national Doctorate programs[28].

The disciplinary areas

The picture of national Ph.D. programs in Italy in the 2003-2007 period reflects a picture of divided disciplinary orientation: included are the most important disciplinary areas such as Product design (with a small quota for Design for fashion products), Design of internal and external environments, Design of materials and components, Design of complex systems/services/strategies, Design of communication/interaction.

To understand the nature of the themes encountered in Ph.D. programs, an analysis of the dissertation abstracts was performed which were then clustered with the same categories adopted in analysing university research in design.

The total of the research themes shows a predominance in the area of Product design (29.3%) and Design of internal and external environments (30.2%)[29], with a good percentage in the disciplinary areas of Design of communication and interaction (18.1%), and Design of systems, services and strategies (13.8%). This is followed by the recently constituted area of Design of materials and components (6.9%) and Design of fashion products (1.7%).

The nature of Doctorate programs

The 116 research activities sampled were then subdivided, using a criteria of multiple assignment, into the following categories: *theoretical research[30], project research[31], instrumental research[32].*

The predominance of instrumental research (59.5%) emerges immediately, which together with theoretical-instrumental research (23.3%), crushes project research and instrumental/project research respectively at 5.2% and 12.1%.

This data is important and testifies to the character of *research for research* on many Doctorate thesis in design, and, perhaps, underlines the disciplinary and operational self-referencing.

The Doctorate program, in effect, seems to be focused on the construction of conceptual, methodological and planning instruments which can support the different fields of the discipline, from training to the practice of research and planning.

This data is further reinforced by the final analysis of the orientation of categories of instrumental research (which has an overall value of 111 out of 116 research activities or 94.8%).

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[28] The number depends on the Phd foundation year and also from the number of Phd course series in the analyzed period: 5 POLIMI - Disegno industriale e Comunicazione Multimediale INDACO; 2 POLIMI- Disegno e Metodi di Sviluppo Prodotto INDACO + DIP.MECCANICA; 6 POLIMI - Architettura di Interni e Allestimento INDACO + DIAP; 3 POLITO - Innovazione Tecnologica per l'architettura e il Disegno Industriale – DENER; 5 UNIPA - Dottorato in Disegno Industriale, arti figurative e applicate - DIPARTIMENTO DI DESIGN; 3 SUN - Design Industriale Ambientale e Urbano – DISPAMA; 6 UNIROMA1 - Disegno Industriale. Design, Arte e Nuove Tecnologie – ITACA; 1 IUAV - Scienze del Design – DADI

[29] The high concentration of researches relevant to Interior Design is due to the relationship between Design Phd and architecture Phd from which they originated.

[30] Mainly theoretical pamphlets imply the construction of new theoretical tools. Theoretical approaches have been considered as research tools.

[31] Dissertations in which the research resuts are mainly related to project/product/service/communication area.

[32] Dissertations which principally explore methods, approaches and tools related to design research. In particular the instrumental research is defined based upon three main categories: research tools, educational tools, project tools.

This further subdivision underlines this interpretation even more: a good 87.3% of instrumental research involves instruments for planning, with 9.1% involving predominantly theoretical aspects and 3.6% involving didactic instruments.

The relationship between themes of Doctorate programs and DRM categories

A reading of the areas of thematic orientation of Doctorate programs reflects an overall image which is *against the trend* with respect to the thematic orientation of university research in design.

The category of *Innovation, industry and hi-tech development* appear as the most relevant focus of researches (21,6%) followed by the area of *Development of cultural and environmental assets* (16,4%) while there is seen a significant and homogeneous distribution within the area of *New Made in Italy* (15,5%), *Social inclusion and health services and quality of life* (15,5%) followed by the area of *urban Quality and security* (13,8%).

This is followed by the areas of *Identity, territory and local production* with 16,4%, the themes of *Energy, mobility and environment* 6% and *Education*, training processes and scientific and technological research with 4,3%.

The results therefore describe Doctorate programs involved in defining explorations which are not, at least not immediately, marketable.

The stratification of the themes and the emerging of certain innovative, typically national themes such as *Development of cultural and environmental assets, Identity, territory and local production, urban Quality and security* indicate that perhaps, there is a *social or environmental aptitude*, mostly active, in Ph.D. programs.

The subject of investigation in Doctorate programs seems to be *reflexive: observing itself* in terms of research and training. The observations which are made in this field are actually aimed at structuring, amplifying, decoding the knowledge which characterizes this discipline in its applied and theoretical forms.

7. Final Considerations

Summarizing the final considerations of the research is a difficult task: this first census and attempt at interpreting university research and Ph.D. programs in design is set up as a first systematic initiative, but certainly does not exhaust and sufficiently detail many topics.

For this reason the first proofs gathered by the research may be used as an analytic instrument of orientation for two purposes: or rather to build ideas in order to orient training policies to research at the Ph.D. level or to reason and experiment with the theme of *research policies*.

The research allows us to make an effort to balance the didactic relationship among design/research training/research.

The public system of education in design has a history of 15 years only and has functioned in the long term even fewer years, but the overall results obtained are important:

- a public system of research effectively exists, a network of sites, competencies, entities which are developed by territorial distribution around an important polarity such as that in Milan; polycentrism and diffusion are two words which characterize university and Ph.D. research in design at this time;

- university research in design is not academic, it is distinguished by its ability to produce applied research and has found a positive relationship both with private and public demands, even though there is a criticality in its ability to attract research demands by international

private entities or be more competitive in the considerable foreign institutional front (specially EU);

- the growing trend of activity is *positive* and does not seem to reflect the current difficulties experienced at the university level, even if there are signs of recovery and problems experienced are perhaps related to the non-existent public or private support.

- the level of relationship with the world of applied research at a high knowledge level (very low number of existing patents) makes one think of an interdisciplinary relationship with better structured techno-scientific disciplines;

- the extensive disciplinary division testifies to the growth of a *complex* vision of design present in the system of research (but also in that of Doctorate training).

Particular attention is deserved by the comment on thematic division: if we hypothesize that we consider this research to be a *phenomenologic* exploration (Bertola P., Manzini E., 2004), then the considerations which may emerge represent a very powerful signal as to the characteristics which this research possesses.

We can definitely affirm that the system of university research in design and Ph.D. level research are effectively involved in processes of defence, growth and support of our economic, cultural and social system.

The themes connected to the innovation of product/process with respect to the productive industrial reality are strongly present and testify to a strongly-rooted relationship between *planning* and *doing*.

Besides this vision which confirms the historical path of evolution of Italian design there is another reality, which we perhaps do not expect, but which instead creates an interesting thematic opening for our discipline.

This research connotation can be summarized in a few key words:

1*. territory*, or rather the connection between quality and places to live and daily experience and the environment is intended as territory, social identity, resources and cultural assets and the collection of experiences and products/services which makes this sector usable

2. *sustainability*, or rather some great global questions (resources, transportation, energy....) as that of ecodesign and social innovation which produces products/services which create problems for the idea of a traditional lifestyle and consumption;

3. *socia*l, or rather interpretation always starting from fixed contexts related to the quality of personal life or collectively to the theme of relationships between people and places of daily experience, work, health;

4. *creation of knowledge*, or rather involvement in processes of reflection on models/methods/instruments of creation, use, fruition and management of knowledge.

There is thus space for original, rich, complex research which deserves to be studied and sustained and we believe that this work is the first step in getting to know and develop it.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Changing the change conference
Design and values: materializing a new culture

Design vision

Cyntia Malaguti[1]

Abstract

The contemporary culture of the artificial environment production, based on unlimited nature exploitation and on intensive consumption, is incompatible with the major environmental issues. Starting from the analysis of the meaning of objects in the culturally built world, the article discusses how the objects participate in materializing and solidifying the principles and values that support the current development model. Finally, points out new kinds of associations that design can create and are essential to the building of a more environmentally friendly lifestyle.

The reflections presented here are exemplified by the author's research carried out through two different experiences: teaching sustainable design for design students and taking part - with an interdisciplinary team - in a monthly seminar called "Priceless Values".

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1. Introduction: the relation design - environment

As it is common knowledge, the artificial environment in which we live in, is the outcome of a culture that determines a "way" of projecting, producing, distributing and consuming. The culture of creating such environment – performed by our contemporary society – got its foundations in the Industrial Revolution, but is inserted, mainly after the eighties of the 20th Century, in the context of what is called the post-modern society, characterized by the ephemeral, by the fragmented, by the discontinuance and by chaos (Harvey, 1989).

This culture led to innumerous environmental problems, posing the urgent need of rethinking the relation man-nature and find support on other basis. Firstly one points out to the critical need of introducing the notion of limits to the above mentioned practices. In a broader look, it is necessary to mainstream the concept of environmental responsibility in our relation with objects and the artificial environment as a whole, as it most often mediates our relationship with nature and with people as well.

Another important aspect to be understood is the systemic vision of the entire human activity. Such as the ecosystems, human activities are deeply interconnected and thus the consequences of a badly planned action are felt – in a higher or lower scale – way over the area where it took place. Inputs and energy used in one activity or process generate, in addition to the end product or service, different effluents and residues. From some sources came the inputs; some place will receive the effluents. In the ecosystems, outputs of a process are inputs for others, maintaining, in ideal conditions, a dynamic balance. Therefore, although the prevailing vision today is that any human activity causes impact on the environment, it is fundamental that one try to minimize these impacts, including, among others, a more thorough study about the existing connections between these activities. In addition to this study, a new model of human relation practices is being experienced, not without conflicts and learning: that of the search for complementariness, for segmentation; for agreements and partnerships, be it in the realm of the so called productive chains, or in land use or even in social relations.

The perception of the importance of the designer's participation in this necessary change process, introduced the concept of "ecodesign", currently integrated to the concept of design itself and understood as *"activity by which, connecting the technically possible with the ecologically necessary, brings about new proposals that are socially and culturally acceptable"* (Manzini, 2005, 20). And, he ranks such proposals in four levels of interference: environmental redesign of what exists; project for new products or services to replace current ones; project for new intrinsically sustainable products-services; proposition for new scenarios that meet the sustainable life style.

This article intends to look upon this last level, supporting itself, as a starting point, on the concept of sustainable design, proposed by Tony Fry (2003, 31).

"While embracing all that is ecodesign, sustainment design (the design of sustainments) serves a more fundamental function. Which is to contribute progressively to the ability to sustain…. it advances structural change towards an economy and culture with an ability to sustain"… "Sustainment design starts with the absolutely basic question of ' what is to be sustained and why'….This shift means a major engagement with lifestyle, workstyle, technology, culture and the relation between the form of an economy, the unsustainable and sustainability".

2. Design and its meanings in the society of consumption

To reflect on the role of objects in the sustainability of a certain lifestyle it is necessary to return to their dimensions or functions. According to Berndt Löbach (2001), products have three

main dimensions: the practical or functional, the aesthetics, and the symbolic. Each of these dimensions, but mainly the latter, is intimately related with the meaning of the objects.

Vasquez (1996) adds onto objects yet another dimension, as a result of the others: the economic, which turns the object into "currency", means of circulation or payment. To these object dimensions one assigns values, a term that comes from the Greek "*axiós*", which means that which makes sense, i.e., has a direction, what is significant and relevant. This means that in relation to them and to the dimensions mentioned, one makes judgments, appreciations that vary according to their usefulness, beauty, significance and relation established between them and other objects, within the system of objects associated to a certain culture.

The objects and their meanings thus contribute for the materialization of the culturally built world. They represent, synthesize and therefore support culture and all its related values and principles. As Bourdieu points out (2004, 10):

"Symbols are par excellence instruments of "social integration": being knowledge and communication instruments (cf. Durkhenian analysis of party) they make consensus possible around the sense or meaning of the social world which contributes fundamentally for the reproduction of the social order: 'logic' integration is the condition for 'moral' integration".

And how does the meaning of objects move from the culturally built world to individual consumers? Grant McCracken (1990) analyses this movement. First of all through the propaganda and the fashion system, consumption goods are associated to certain categories (such as social class, gender, age, occupation) and cultural principles (ideas or values according to which cultural phenomena are organized, assessed and construed), which compose the culturally built world. From the consumption goods these principles and categories are transferred to the end consumer.

This entire process is connected to the consumption mechanism as several authors have already spoken about. McCraken also brings up the concept of "displaced meaning" for the object. According to him, in the life of us all, there is a considerable distance between the real and the ideal world. We thus keep our dreams and desires, while always trying to shorten this distance. Objects, due to their capacity of materially representing this ideal world, function as its concrete and lasting signals. They are a part that symbolizes the whole and brings it close to us, soothing internal conflicts and frustrations. The economic value is associated to this symbolic value they hold, reinforcing the consistency of this symbolism. Finally, they are very diverse and encompassing and are able to respond to different tastes, styles, cultures and specific needs.

Slavoj Zizek (2005), Slovenian philosopher and psychoanalyst, complements this vision when he comments on what we know and what we do not know of the world. He reminds us that in the unknown world there are things that we know and are not familiar with, but there are also things that we do not even know we don't know or are not familiar with. On the other hand, in the known world there exist not only the things we know we know. There is yet a last critical relation: the known unknown, or the things we don't know we know. According to Zizek it is exactly with these known unknowns that design deals with. For this reason therefore, it is an ideological device as well.

Different human desires and needs are associated to values that sustain and stimulate the strengthening of the current lifestyle, materialized in objects such as: happiness, linked to the accumulation of goods and to wealth; eternal youth and the fear of death, associated to the compulsion for novelty and virginity, while constantly discarding and changing product; the appearance of wealth, associated to the excess and the stimulus to waste; the pursuit of identity in reaction to the massifying phenomenon associated to the adoption of successive trends; the freedom transmuted in right of choice among multiple consumption options. As Moles (1981) already underlined, the object turned in to a message outside itself and out of its materiality.

This has taken place to such extent that in our society human relations are often no longer person to person. They have become relations person-object, where the second looses its person dimension to start fitting into a merely utilitarian and service function, a function to meet a

need a desire or a determination of the first. Bauman (2004) highlights that the other human beings start to be judged according to these objects' standards, according to the volume of pleasure they provide and in terms of their "monetary value".

3. The materialization of new values and meanings

The construction of a path towards sustainability also touches upon the reflection about the role of design in this process of change. As a path towards a sustainable life, John Charles Arbucle (1994, 17-25) proposes what he calls "compassionate design" supported by three strategies connected to attitudes of participation and action: re-symbolize, regenerate and redesign. According to him *"the capacity to re-symbolize is to acknowledge that the fundamental change takes place at the level of the image".* Regeneration, however *"…is a conversion process. It is the capacity for deep changes that grows within us, when we begin to nurture new values, new ways of seeing things and of recovering the energies in our heart. It is where change starts."* Re-design corresponds to *"Our capacity to create ourselves and to build our world".*

What is it that could be re-symbolized, regenerated or re-projected, for the fostering of a sustainability oriented culture? One of the critical aspects in this process are the values and their different ways to materialize in shapes, colors, materials, sounds, textures and several other perceptive-sensorial features of objects and the systems they integrate. Even Santa Klaus has already been used in soft drinks promotional campaigns and the color of his outfit changed to red so as to create a subliminal association with the product's brand! And wasn't it the same red color, the most sacred to the Russian Orthodox Catholicism, the one adopted by the communist flag? On the other hand, more recently recycled paper was repositioned in the media, turning from a symbol of second category packaging into a sophistication indicator, in a communication effort to value more environmentally sound options.

So if we catch up on the questions posed: what values sustain the society of consumption? What objects convey such values? Would it be possible to re-symbolize, regenerate or re-design these objects, or even create new ones carrying other meanings? What values would be fundamental to help in the construction of a sustainable society? What would be the role of designers in these transformations?

No doubt the questions are broad and complex and we are not pretentious to the extent that we may think we will answer them fully in this article. However, one may risk a few answers, even if provisional. The following table tries to confront some of the principles associated to the consumption society, to "substitute" values, yet pointing at some activities that help strengthen the second. Somehow, in several of them, design already takes part by developing tools, equipment and support infrastructure.

Table 1: Values and promising practices: from consumption to sustainability

Values and consumption	Values and sustainability	Promising practices
consumption in the sense of destroying, devouring, consuming 'till total destruction	care, conservation, fruition;	- gardening, vertical orchards - outdoor sports such as sailing; climbing, trekking or rafting
Accumulation/Building up of collections and superficial experiences	broadening and deepening of each experience using human sensorial organs better identification of new uses	- recycling of objects and materials and exploring new properties such as the sound of objects for new musical instruments

Convenience associated to the “use and throw away”.	Other “conveniences” such as survival, maintenance, balance;	- all repairing and maintenance services - selective collection initiatives - rental of clothes and different types of objects
Virginity, novelty, eternal youth	Old age, history, memory, experience and brands accumulated in time, durability	- second hand commerce, customization of clothes - furniture recovered, painted or reused
Luxury as ostentation, appearance or exclusiveness, boldness or transgression for free	Luxury as a demonstration of attitude committed to a cause, courage for ruptures Luxury as quality of life	- efficient public services network, such as public transportation, education and health.
Creation of idols as referential of identity and beauty to be followed	Respecting and valuing diversity; Enhancement of the concept of beauty	- events and opportunities for exchange and sharing between cultures
Individual property and ownership	Valuing the common good, the collective, the communitarian.	- urban furniture/equipment - playgrounds - public transportation

Each one of the correlations shown in the above table could be object of study, identifying activities, participants and related objects, their characteristics and type of contribution towards sustainability; in addition, one might discuss the role of design vis-à-vis each one of them.

There is yet another fundamental question: who would the agents of this process be? Two contrasting dimensions are part of human nature: that of creature as a living being among many that inhabit planet Earth, and that of creator, as a being who, to live, interferes and transforms nature, creating an artificial world as a second nature. This second dimension, that of the creator, is deeply achieving for the human being, as various theoreticians on human needs and desires demonstrate. However, since the Industrial Revolution, society was divided in producers and consumers, with power associated to the first. The creation of artifacts was progressively linked to capital, concentrating in the hands of few and distancing people from their potential creator, devaluing artisan activities and splitting people into two groups: creators and consumers. Thus the concept of “compassionate design” – from a sustainability sand point – should contemplate / look to a creative process shared better among all its stakeholders. As Manzini says (2007, 15):

“…designers should accept the fact that they can no longer aspire to a monopoly on design, since we are living in an era in which everybody designs. They should accept that today design is not only executed in design studios, but everywhere.”

4. The sense of place, of the collective and of the community

We would like to spend some time, however, on the last line of the correlations between values, taking as baseline Augé’s (1994) and Bauman’s (2004) observations, respectively, about

the “non-places”, and about the sense of community. We live in an extremely individualistic society, where the “common good” is not felt as something belonging to all; more and more, public environments are experienced solely as transit areas, belonging to no one. Even though paying our taxes, we feel responsible only for the spaces, services and objects that we buy, that are our exclusive property.

As Marc Augé (1994) highlights, the urban man today inhabits a space he calls “non-place”. According to him, places, from the anthropologic perspective, hold three fundamental features. They are identitary, relational and historic.

Nevertheless, the places that design/compose our reality today carry very different characteristics…In the city we live in, people are generally born in a clinic and die in a hospital (when they get there in time). Points of traffic and places occupied temporarily, such as hotels and holiday camps are continuously multiplying. In this world what prevails is solitary individuality, the passage, the temporary and the ephemeral. This environment Augé calls the non-place; always responding to specific ends (creating a solitary tension and not welcoming entirely); the text always invades the space (“follow the right queue”, “smoking forbidden”, etc); there is no time for history for it is only traveled through; it creates its own system of identifying its visitors by controlling access.

Within this scenery we’ve lost the sense of belonging and the responsibility for the collective. Without the perception of the value of the “common good”, the sustainability speech is, for many, impoverished; it becomes very difficult to recover the systemic and relational vision of phenomena, mentioned in the beginning of the article. Can we strengthen the sense of collective by means of design?

Adding onto Augé’s vision, Bauman (2004, 96) also highlights that:

“The greatest and probably most fundamental success of the market’s attack has been, until now, the gradual but consistent (although in no way to be considered complete and irreparable) ruin of the skills of sociability”.

He however points out that there exists yet a *“gray zone”* in this offensive, represented by some communities, neighborhoods and circle of friends, where members may still consider themselves *“partners in life and for life”.* Environments where solidarity, compassion, sharing, aid and mutual empathy still exist.

5. Objects and community activities in practical cases

- experiences with design students

Analyzing some didactic exercises in the field of design, personally experienced, we identified two relevant cases for discussion.

The first one refers to the development of a set of packages for craftsmen in the region of the Ribeira River Valley (one of the State of São Paulo’s poorest areas, living mostly on banana plantations), after a competition for the undergraduate students of an industrial design college. The request was made by SEBRAE (Development Support Service for Micro and Small Enterprises), intermediating a group of women who worked in a cooperative system, developing a series of goods manufactured with banana-tree straw (baskets, hats, vases, rugs, etc).

The idea was to use as principal raw material the paper made from the banana-tree fibers which they had learned to produce with the scrap of material used in the handcrafted goods. The relationship between students and the community lasted for about one semester and about twenty sets of packages were created, three of which were awarded a prize and one was selected for implementation. This resulted from the evaluation made by a Committee with members of the community itself. Despite the existing interaction between students and

community during the competition phase and after that, during the training to produce the selected packaging, the system was not implemented.

One of the possible reasons for that could be that the process was not conducted in a "peer-to-peer" way: SEBRAE always intermediated all interactions. Another one could be the leaving of the group leader. Also, SEBRAE's request intended to service a much broader and heterogeneous group of craftsmen without a previously structured network. From that, we learned that professors conducting processes such as this should be in charge of a deeper reflection about the meaning of such experiences in the education of future designers, about the most suitable procedures as well as the duration and type of relationship to be established among all involved in the process.

The second didactic experience, was the follow-up of program conclusion projects for graphic design students in a college in São Paulo, who chose the "environment" as core theme for the year 2007. In this case, each student was free to choose both the type of project and the target public. Among the almost thirty projects made, there were many campaigns, publications and brands for products that addressed environmental issues. Within the focus of this article, however, what deserves to stand out is that many of the projects shifted from an educational or protective position towards fragile communities, to a "peer to peer" approach, be it in campaigns targeting the designers, in electronic games (stimulating a playful experience), or even in some campaigns and events.

An example of such an approach was the "see the city" project, which making a play-on-words with the word "veracity" (in the Portuguese language), placed images of São Paulo's degraded areas on the Internet. Within the proposal of "viral marketing", the website offered the internauts the possibility of making personal interferences in the images eventually posting them to exhibition and voting in a blog. In this case one may notice, not in much detail though, that the authors wanted to instigate the "look" of citizens towards details of the city, taking ownership of it as their "place of dwelling", and waking them up to an active attitude towards it to risk a "virtual reconstruction" of the landscape from an enhancement perspective.

In this second experience freedom and increased maturing of students allowed some reflections and more encompassing formulations about the role of design vis-à-vis the environment. Nevertheless, they better specific guidance to better fundament their works, both from the social and environmental issues' standpoint and for the designer's possibilities of action.

- observing collective practices and the use of objects

Other reflections connected to the role of objects in the strengthening of sustainability oriented values, and, especially, of the sense of community, were provided by the five year participation (2002-07), in a professors' interdisciplinary group, which conducted a monthly seminar called "Priceless Values". This seminar, sponsored by the Palas Atenas Association, was addressed to teachers of the public elementary schools of the municipality of São Paulo.

While addressing – in one of the seminar modules – the theme of human relations, the objects and the role of the latter in the materialization of values and principles, we faced some peculiar situations in the history and traditional practices of some groups of the Brazilian culture. In these, the object was the core of a collective activity where fundamental values – escaping the mercantilism logic of life proposed by the consumer society – were kept alive. What objects were these that played this critical role? Five of them caught our attention in particular; the little Indian bench, the *Cuia de Chimarrão* (mate pot), the *Berimbau*, the *Tucum* ring and the bicycle.

Benches manufactured by the indigenous people and used by different Indian tribes from North to South of the country before the discovery land mark in the year 1500 AC, carry to this day, a strong symbolic dimension in addition to its function of use which is that of sitting down on it. Although in the day-to-day little benches can be used indiscriminately by all individuals of a village during rituals, moments in which they experience their beliefs, they become attributes exclusive to certain individuals such as Chiefs and Shamans, representing a bridge between the material and the immaterial, the tangible and the intangible, the natural and the supernatural.

Their shapes, very rich and elaborated, distinguish themselves from tribe to tribe and user to user, reflecting their entire symbol related universe.

The *cuia de chimarrão* (mate pot), on its turn, is an artifact that together with the tripod to support it, the *"bomba"* to suck the mate plus the hot water kettle or thermos bottle is obligatory among the apparatus of an authentic *gaucho* (those born in the Southern state of Brazil). The *chimarrão* was originally a very hot tea drank by the Guarani Indians to which the Azores immigrants, the *Bandeirantes* (explorers), *Tropeiros* (on-horseback cattle guides) and many others got accustomed to, given their energetic properties; today the habit of taking *chimarrão* from the *cuia* is spread throughout many states of the South of Brazil. The manufacturing and use of *chimarrão* set follow rigid standards, which a good "*mateiro*" (lover of chimarrão), knows very well. An in-group practice among family and/or friends, a moment for relax, to chat time out, tell stories, drinking *chimarrão* according to the rules of the traditional ritual. The first mate (of worst taste) is the *cevador's* (the one who prepares it); after him the round will start by the eldest or someone one wishes to render homage to.

Similarly to what occurs with the peace pipe, the *cuia de chimarrão* passes from hand to hand, going round in circles, with all people putting their lips at their turn on the same *bomba*. Every one must drink all the content of each "mate" (full dose) until the *bomba* "snores", since finally air and not tea is being sucked.

Now the *Berimbau* is a musical instrument that originated in Africa and was brought to Brazil by the slaves. It is traditionally used to play the percussion and beat the rhythm of the *Capoeira* dance/fight rounds. Considered a symbol of the black culture resistance in Brazil, *Capoeira* is "experienced" as a game. A circle is formed where all sing and clap their hands at the rhythm of the *Berimbau* and in the center two players at a time perform a sequence of movements in a silent dialogue and tuned action and reaction, mimicking a wrestle. A player, however, doesn't touch on the other; each *blow* is only "marked' by the beat of the *Berimbau*, as if it were a dance where the most important is the synchrony between both, the evolution and the movement skills. The winner doesn't destroy his opponent but shows his superiority through the sequence of his blows and is acclaimed by the people in circle. A key element for C*apoeira*, the *Berimbau* – such as the *cuia de chimarrão* – is handcrafted following a series of strict criteria to guarantee its correct performance as a musical instrument.

The *Tucum* ring belongs to a completely different category of objects, connected to a different social group. Also manufactured manually from an Amazon palm tree's small, rigid and black seeds, it's used mainly by intellectuals who "embraced" the indigenous cause and the poorest. It symbolizes a peoples' alliance, as an individual and as a social being, to carry ahead the vindication of rights and these people's hope for a more human and fraternal world. According to some, the start of its spreading was in the seventies, especially after the CIMI (Missionary *Indigenistic* Council), hence its strong dissemination among some sectors of the Brazilian Catholic Church, engaged with these causes.

Finally the bicycle, which apparently has no relation with the previous objects, has more recently provided an interesting collective experience in the large urban centers: the night pedaling. This practice has greatly spread throughout Brazil after the nineties, through a radio show. Journalist Renata Falzoni rode her bike across the city of São Paulo in the rush hours, giving tips about alternatives pathways and points for a "happy-hour" stop, indicating a "distinct" place on the way, suggesting the listener to take a break and "escape" from the daily stress. The idea of exploring the heart of the city by pedaling, originated the so called "night bikers". Today they are organized in "clubs" or groups, which after 9pm usually, do the programmed Internet-informed tours. There are different paces and routes according to the profile of the group and the day of the week; a series of rules is part of the practice, as well as the use of some specific complementary objects such as ID T-shirts and helmets.

What do the exposed objects and their relative usage have in common? Although they here described briefly, one may realize that they do not fit into Baudrillard's (1973) and Moles'

(1981) classification system for objects and they fulfill very distinct functions such as a seat, a drink container, a musical instrument, a decoration and transport equipment.

6. Drafting an analysis

Some authors assisted in the study of these cases, mainly the second group, in the perspective of analyzing their contribution for the strengthening of a sustainable society. From the first to the second group of cases, the focus is shifted, from the point-of-view of the creation of the objects, to their use. It is not the attribution of value, but the value effectively attributed to the objects that are being considered. They are appropriated by their users, which have great intimacy with them, getting to know the most adequate ways of using them, their potential, their most relevant characteristics, and knowing how to carefully choose a "good" product for that practice.

Certeau (1994) and Canclini (2003) bring interesting approaches about the consumption process, which assist in the qualification of the cases presented. Certeau says the consumption can also be considered as an astute "production", disperse, silent and almost invisible, which is manifested in the ways of using products. But here, we cannot say that the products in question have been imposed by a dominant economic order.

He divides this "production" into two levels: the tactic and the strategic, the first being defined as *"...a calculation that cannot count on itself, nor, therefore, with a frontier that distinguishes the other with total visibility. The tactic only takes the place of the other. Then it insinuates, fragmentarily, without apprehending it entirely, without retaining it at a distance."* (Certeau, 1994, 100)

On the other hand, the strategic level is defined as *"...the calculation of the relationship of forces that make it possible from the moment in which what the person 'wants' and 'can have' is isolated from an 'environment'. This postulates a place capable of being circumscribed as itself and therefore capable of being the base for the management of their relationships with distinct exteriority."* (Certeau, 1994, 99)

According to this division, the products considered have allowed their users to have a position closer to the strategic, allowing a more aware behavior, as actors in a process. The practices to which they are associated would be important in strengthening this position.

Canclini (2003, 73) highlights the character of consumption as a practice associated with citizenship, which can be applied to the cases dealt with here, when he comments that:

"We can act as consumers placing ourselves in only one of the processes of interaction – which is regulated by the market – and we can also have as citizens a more comprehensive reflection and experimentation that takes into account the multiple potentiality of the objects, which makes use of their 'semi-optic virtuosism' in the varied contexts in which the things allow us to meet with people."

And when this occurs, in his opinion, the consumption can become a place of cognitive value, useful to think and act, in a significant and renewed way, in social life.

Another peculiar aspect to the cases mentioned is that none of the practices analyzed were to meet the objective needs of daily life, although the majority of them have practical functions. Bizzocchi (2003), based on the Hedonist doctrine, considers that the human practices are ruled by two basic principles: the search for pleasure and the escape from suffering. From there they support their modal structure on the "*want to do"* or on the "*should do"* – and eventually on both. He calls the first practice Hedonic and the second pragmatic, comprising those that give practical and effective resources for the resolution of the human problems. Evidently, both are important for our well being and, analyzing the various human practices, both principles occur on a greater or lower scale. However, on observing the examples presented here, we can say that

the Hedonic aspect is more relevant in all of them, i.e. the search for satisfaction, for pleasure, much more than the solution to a practical daily problem. And, also:

"If it is true that the ultimate end of human existence is to find pleasure, then the Hedonic activities are end-activities, because they lead straight to pleasure, to the extent that the pragmatic activities are means-activities, by which we accomplish the first stage in the search for pleasure: the elimination of the sources of dissatisfaction." (Bizzocchi, 2003, 40)

In his opinion, this motivation is constituted in the pith of the cultural practices. It is this that configures and solidifies traditions. Complementing this vision, Giddens (2003) highlights that although the traditions and customs have constituted the essence of life of most people during a major part of history, the current interest for them has decreased in detriment to the discussions about modernity, post-modernity and their meanings. In his opinion, the traditions were and are constantly invented, as well as altered or transformed, and we should try and understand why. He also observes that they are properties of groups, communities or collectivities, defining a kind of truth, offering a structure for the action, which can remain unquestioned. They are necessary and will always persist, because they give continuity and form to life, like rituals and ceremonies that are repeated time and time again. Although, on one side there is an association of them with conservatism, in our global society it has reemerged.

"As the influence of tradition and custom becomes thinner at global level, our own base of identity – our own sense of individuality – is changed. In more traditional situations, the sense of identity is sustained largely by the stability of social positions occupied by individuals in the community. There, where tradition declines and the choice of lifestyle prevails, individuality is not immune. The sense of identity has to be created and recreated so that it is more active than before." (Giddens, 2003, 57)

According to Giddens, it is in the midst of these traditions, even though they are not very old, but constituted recently, like the ride of "night bikers", where values and moral commitments are strengthened and raised above common everyday concerns; values that we want to defend, in case they are threatened; values by which it is worth living.

7. Final considerations

With the examples described we tried to demonstrate the relevance of more thorough studies on the practices considered as current or recreated traditions, where the ultimate end is not the resolution of everyday problems, but the practical performance in itself, through the satisfaction it gives, by valuing the sense of community that it brings about in a perspective of strengthening the transition towards a more sustainable society. In a certain way, requiring special attention, the objects that make such practices or attitudes feasible are almost like "fetishes", under various angles; their form, materiality, changes and players in the process of creation and appropriation. In all the cases, the participants of the practices acquire great intimacy with these objects, getting to know their characteristics, uses and cautions quite well, knowing how to enumerate the qualities of a "good product".

Retaking the initial proposition of the article, of reflecting on the meaning and values transmitted by the objects, as well as their importance in the process of change in question, the cases presented highlight the importance of being aware of which values need strengthening since, the objects used are mediations between people and not just mere objects; because they are not just objects, but also inter-subjective, not just problematic, but dialogic. (Flusser, 2007) And, in this process, we do not only need this awareness, because the processes of attribution and appropriation of value, performed respectively by the creator and by the user of the objects, are not necessarily coincident. *"No design can be 'perfect', and coincide completely with the theoretic model according to which it was created."* (Flusser, 2007, 208)

Based on this assumption, it is essential to change the idea of what it means to be a designer today, as highlighted by Manzini (2007) and previously mentioned in this article.

Thus, reconsidering Flusser, the challenge of the designer today is to emerge from himself and from the world around him a form that involves both of them, revealing the way in which people emerged from the world to experience it; not imposing an idea about something considered previously as amorphous. And, to work intentionally towards sustainability, maybe the concept of “maieutic product”, proposed by Morace (1990), could be reconsidered, defining that which is able to strengthen people wisdom in confronting their own existence, to generate a new quality of life, and to achieve perceptions and much deeper emotions.

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Fig. 1: Slaves using Berimbau – Debret painting.

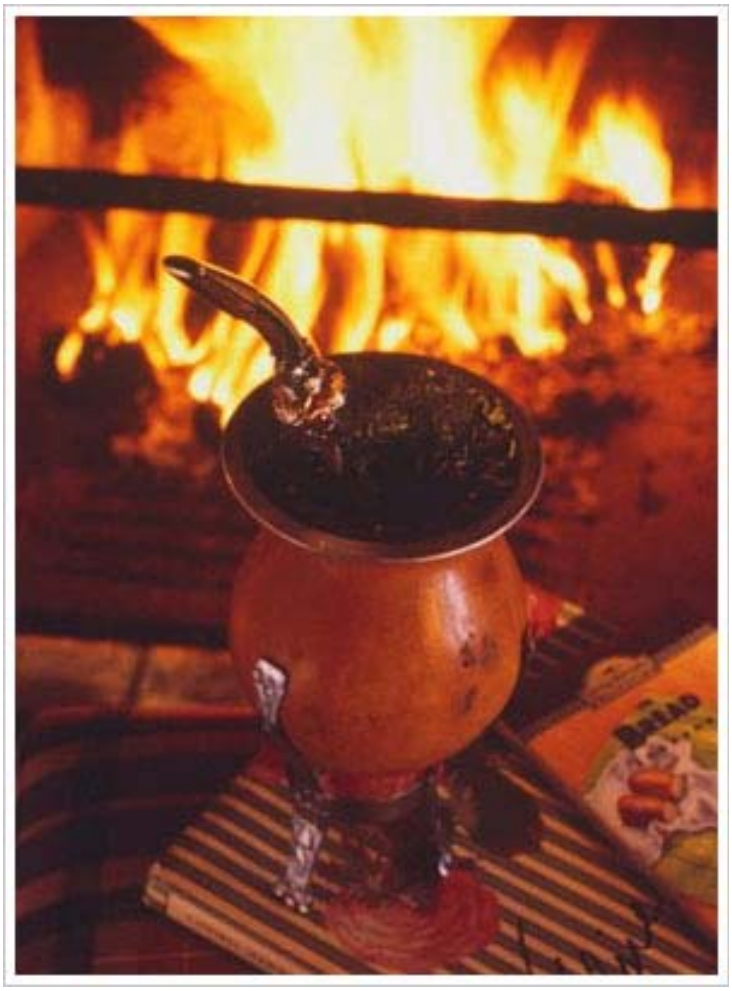

Fig. 2: Traditional *chimarrão* set.

Fig. 3: Night bikers cycling at São Paulo city.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Sustainable mobility design in contemporary towns

High social and technological innovation alternative mobility system

Antonio Marano[1], Giuseppe Di Bucchianico[2]

Abstract

One of the most important factors of the contemporary city environmental crises is the warped idea of the local transport. As a matter of fact they are based on the widespread of the “car monoculture”.

Within this problematic field, the present paper illustrates the design called *Friend Bus Service Solution.* It is based on the possibility to modify and regenerate local transport system, making them more flexible, more attractive, and nearer the users need. The study compares with the experience implemented in many parts of the world, and it develops according to the design methodological approach for sustainability.

The main results obtained concern the pre-figuration of probable scenarios of alternative mobility, the sight of twelve sustainable services for mobility, the concept design and the interior design of a modular vehicle for public transport.

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1. Introduction

The fact that our cities are unbearable depends mostly on the use of private cars which are considered, too often, the unique means of transport by which it is possible to afford any different kind of mobility within the urban habitat.

In metropolitan daily routines, city connections within the urban mobility are narrower and narrower. The urban mobility is considered as a whole of people and things flows which supply the metabolism of a city, its environmental quality and its social defence. These kinds of relationships often cause discomfort and difficulties, high economic and energy giving costs caused by traffic congestion, high level of sound and weather pollution, risks of street accidents both for cyclists and pedestrians. As a matter of fact, they evaluated that, in Europe, traffic jam costs are equal to 0.5% of GDP (gross domestic product).

In modern society, therefore, they feel the need for a sustainable urban mobility that will be able not to weigh too much on the local social and economic system.

By promoting alternative forms of urban mobility, on the contrary, they may start virtuous process of reduction for urban chaos with the consequent increase of street security and reduction not only for street accident risks but also for the economic and social costs linked to them. Nowadays it is possible to afford and solve urban mobility problems through both the carrying out of local mobility system based on transforming course in pedestrian way and the assisted use of nimble means of transport linked effectively to fast public means of transport for long distances. As a matter of fact changes in the city way of living require a different organization of the urban mobility. All of that is possible through the regeneration of technological and social networks that permits to optimize flows, to coordinate exchanges among different means and facilitate the shared use of vehicles and equipping.

2. Aims of the research

In the problematic field of the urban mobility and in the view of sustainability, the present paper reports the results concerning a social and technological high innovation of an alternative mobility system.

The general aim of the current research consists of the re-launching of the multi-world mobility in order to improve the whole efficiency of the local transport system, the economical cost reduction for mobility, the regeneration of the metropolitan social contest, the improving of the environment quality for specific urban contests and the psychological and physical health of the users.

Nowadays, it is possible to favour the use of public means of transport thanks not only to the stimulus for present environmental influence but also to the possibilities offered by the new information technologies applied to the local transport system. According to this view of change, the specific aim of the paper consists of re-launching the alternative mobility through the proposal of a *Friend Bus service solution.*

The idea consists of supporting the use of public means of transport, and creating at, the same time, cultural as well as social and economic conditions in order to attract large sector of population through a wide and differentiated system of services aimed at improving the alternative mobility and the quality of the metropolitan life in general. They have been looking for a proposal that systematizes technical knowledge, sustainable services referred to new form of alternative mobility that is innovation in the eco-friendly field. Moreover the paper is also aimed in prefiguring probable city changing by the light of the information technology applied to local transport. According to this position they research, first of all, an inter-modal mobility system

capable of favouring socialization, exchanging experience and knowledge, taking active participation of all the users of the service; secondly they research how to satisfy the way to reach job, schools, entertainments and information point of locations by the community in accordance with men health and environmental quality of the urban contest.

3. The international movement for alternative mobility

In many cities they are developing and carrying out mobility systems characterized by a great variety of local transport alternatives such as fast flowing public transport, sharing taxis, car-sharing and car-pooling services, virtual mobile office, cycle-lane and the possibility of going on foot pleasantly.

All of that takes place in Groningen, The Netherlands, which, with its 60% of transport by bike, is considered the world capital of bicycles. But it is also common to Italy, exactly in Ferrara where 30% of mobility is done by bike along efficient and safety cycle-lanes. When you arrive at the city you will leave your car at the parking site and exchange it with a bike offered to the citizen's disposal by the town hall. They also take care to reduce the number of vans and lorries that every day reaches the city in order to supply any kind of goods. For the same reason, in the nearby suburbs, they prepare some platforms capable to intercede the whole commercial traffic by compacting goods and by stopping those vehicles that enter the city for few deliveries. Car-sharing is also expanding in many European regions. It consists of a car sharing system born in Switzerland and it is capable to eliminate the use of, at least, eight vehicles. A recent research has shown that those who belong to a group of car sharing use their cars less frequently and in a more intelligent way than those who has got one. Taxi-sharing services are spreading rapidity, even if they are integrated with other public transport modes. Moreover, many are the cases of inter-modes present nowadays in order to facilitate the exchange train-bike. Among the initiatives in favour of sustainable mobility, we can find also those designs that help families in routine duties, such as bringing kids to schools called *Walking Bus* in Great Britain and *Andare a Scuola a Piedi (Going to School on Foot)* in Italy. *Mobility Manager in outsourcing* services are increasing in number and they can represent an actual support to mobility within companies in a manner that is similar to the organization and running of a sustainable mobility for fairs, conventions and great events.

As regards proposals for public transports, recent innovations concern the optimization of the local transport network as well as the experimentation for authorized technological solutions. Among the former we can mention Lam, high mobility lines, in order to obtain frequency and higher speed than the normal lines through reserved tracks and with the help of preferential traffic-lights device. An alternative may be quality bus lines such as *QBCs Quality Bus Corridors* that characterize initiatives promoted by *Dublin transportation* (Dublin City Council) with the aim of incrementing the use of public means of transport, bicycles and to increment going on foot. Among the second we can find different technological systems such as *TVR, Transport sure Voie Reservee* (TVR-Bombardier), done at Rochefort, in Belgium, where, to drive the vehicle, only one rail is exploited and it is put just in the middle if the lane: the *Civis* (Comune San Lazzaro di Savena), with automatic driving manufactured with optical sensors capable to elicit the position of proper track painted in the middle of the lane; the *Stream* (Trasporto Pubblico Locale di Trieste), the evolution form of the trolleybus without any air contact; the *APM*, *Automated People Mover,* (International Airport Automated People Mover Association) electric automatic system without driver, the mobility of which occur with single or multi vehicles on rails or driveway; the *PRT, Personal Rapid Transit* (Personal Rapid Transit) that consists of only one nimble rail travelled by little cages (for not more than six people), their mobility is automatic without any operators; the *Sky Web Express* (SkyWeb Express), a system made up of three/four passengers vehicle that travels long only one network rails in elevation. Great scientific interest has risen in the past few years from the results reached by Mit in Boston through the *Smart Mobility System* design (The SENSEable City Laboratory). Those designs are based on the idea that the urban *wireless* network can modify local transport and render it more flexible and nearer to the users needs. In Bogotá they have recently adopted the

TransMilenio (TransMilenio). It is an innovative *Bus Rapid Transit* system (*BRT)* that uses fast flowing public means. The design works out as a light rail system. Transport lines are subdivided into local and express, the former travels within the neighbourhood, the latter covers long distances and have few stops. That design has already been exported to Chile. It will be exported soon to Columbia, Thailand and Nigeria, and it is an interactive one as its vehicles and stations are provide with a series of technological aids such as optical recognition smart cards and a monitor for real time information.

4. Design methodology

Research developed according to a methodology approach that changes sustainable products and services in a synergistic way. According to that they followed a methodological scheme subdivided into four stages, the development of which occurred from the service to the concept of a sustainable product (Marano 2007, 153):

1. *Preliminary stage of knowledge* of the physical, social and economic characteristics define quality and no sustainability of the environmental contest. In order to satisfy that it is necessary, on one hand, the sharpening of our ability to recognize both degenerative phenomenon of the physical and social quality of the metropolitan environment, and the local identities that render feasible a sustainable proposal of transformation. It is also necessary, on the other hand, to identify suitable instruments and methods to elicit all the complex relationships and the reciprocal influences among the different components proper of the scenery of reference. Furthermore it is also necessary a wider integration of the design within the other disciplines such as sociology, economics, planning and technology.

2. According to the above relevant knowledge (stage 1), promoted through the methods of the systemic thought, they go ahead with a *scenery stage* in order to research sustainable solutions (Manzini and Jégou 2003, 51), qualified by a coherent system of products and services characterized by a high regenerative capability with low environmental impact. That implies the sharpening of the conceptual and effective instruments both of the strategic design concerning address and trend, and of the service design concerning the formulation of the interaction between services and users.

3. Sustainable solutions (stage 2) define the design *brief* related to the key products of the proposed services. It is *one of the work programme stages* that fix the level of innovation of the product required by the sustainable solution. All of that presses for a checkout and for the use of adequate instruments of the design and of the evaluation of the ecological compatibility.

4. Finally the conditions required in the programme stage (stage 3) have the role of controlling the stage concerning the drawing up of *new concepts* for products essentially sustainable. That means a wider ecological awareness and the use of specific design guidelines oriented towards sustainability (Vezzoli 2007, 83-120), within the promising attempt of assigning a moral value to an industrial product.

5. The *Friend Bus service solution*

On the basis of these guidelines the theme of alternative mobility in contemporary towns has been afforded. The application field is related to the project called *Friend Bus Service Solution.* It is based on the idea that it is possible to change and regenerate public transport systems, making them more flexible, attractive and closer to users requirements.

Multi-modal mobility

The solution suggested aims to get large classes of users to re-approach public transport, by means of an integrated and diversified system referred to common services meant for the improvement of metropolitan life quality.

The proposal is made of a multi-modal system involving innovations both in technology, functional and social field in order to favor: socialization with exchange of knowledge and experiences, active participation of all service user; roads map, culture and daily life information supply. It takes advantage from the latest innovations referred to wireless networks and miniaturized transmitters to optimize flows in the urban network in order to organize exchanges among different means. Further, the use of information and communication technology allows to detect more easily the users requirements located in the urban network, re-shaping continuously the service offer. *The Friend Bus service solution* is based on the use of long urban buses trains, able to become more flexible either physically, or due to the service offered in order to get into the roads network more easily. It is connected to a wider multi-modal system favoring on one hand, mobility by walking and biking and, on the other hand, the train, which is one of the most effective types of fast and long distance transport. Further, the system is arranged by sharing the use of vehicles and equipments.

Alternative mobility service system

The Friend Bus service solution consists of twelve alternative mobility systems responding to the requirements of different and potential groups of users. The services intercept the largest range of actions, socially and economically more sensitive, connected to metropolitan daily routine. These services have been named according to the solution they offer. Some of them (seven) are referred to new forms of bus-use: *FRIENDbus* for socialization*; BOXmarket and TakeawayBUS* for shopping and refreshments; *RechargeBUS* to get economic benefits advantages; *BUSgallery*, *BUStheatre* and *BUSbar* for culture, information and entertainment. To these, other five services are to be added arranged according to a model perfectly fitting the previous ones. They are referred to mobility by bike, by train and by private means of common transport: *BIKEadvertisement* to obtain by biking economic benefits; *TeleBIKE, CoachBIKE* and *VIDEOoutliers* for mobility and information related to students and tourists, *InteractiveMAP* for sharing the use of private vehicles.

Each type of service suggests a solution proposal and has been represented through the narrative model based on strategic design communication tools (Meroni 2003, 235): title, demand and brief description to restrict the idea at the basis of the solution (title) in its essential and evocative lines; to point out the necessity dimension where the idea comes from (demand), to report the organization objective aspects and their functioning (description); storyboard to visualize by means of associated images linked to didactic texts the essential situations and the service benefits.

The *Friend-bus* primary services are:

- 1. *FRIENDbus: how to make new friends and arrange a weekend outside the city joining other people using public transport?* “FRIENDbus” is a service on–line available on public transport network enhancing socialization by allowing the users to make new friends by sharing their own interests and activities they carry out. By enrolling themselves in the system database, the service, connected to the Net used also on buses, gets in touch the people potentially interested to share activities and traveling experience in the outskirts of the metropolitan area.
- 2. *BOXmarket: how to arrange shopping without going to the supermarket by using the bus ?* “BOXmarket” is a service which, meant also for those people who don’t have much time at disposal, allows to buy on–line fresh products from home, from the office and even from public means of transport. The service uses the bus for transporting the shopping booked in advance which the user, by using a pre-registered personal pin-number will collect directly at home in “BOX-markets” located near the bus-stops or delivered at home by the service operators.
- 3. *TakeawayBUS: how to book and collect directly our own meals from the bus?* “TakeawayBUS” is a service which allows to collect the meal directly from the bus meant for those who have short time to spend on cooking and on a correct diet. Helped by a nutritionist, users can select and book on–line the most suitable meal

according to their own nutrition requirements. The bus is equipped to have the food collected and prepared in packaging easy to be carried which will be delivered back the following day getting on the bus again to go to work, for example.

- 4. *RechargeBUS : how to get around the city by using cleverly the mobile phone?* "RechargeBUS" is a service involving telephone companies, the urban transport management company and commercial activities meant for being promoted on buses. The user, by purchasing a telephone re-charging card is "identified" by the system each time that he/she uses means of transport. In this way he/she accumulates scores in proportion to the distance covered according to use frequency. In this way the user has the right to save some money on his/her transport-subscription card, or in alternative can get cheaper prices when purchasing items in the shops joined to the initiative.
- 5. *BUSgallery: how to get around in the city for "art immersion"?* "BUSgallery" is a service allowing young artists in town to get to be known and allowing travelers to approach contemporary art during their daily trips on the bus. Artists publish on the service website their works which can be observed and "voted" by travelers directly from terminal-displays placed at bus stops. The most "clicked" art–talents will be able to exhibit later their artworks directly on the Bus-gallery meeting and talking to the users who have voted for them. In the same exhibition area arranged on the BUSgallery, books and culture activities can be exchanged.
- 6. *BUStheatre: how to enhance and promote music and theatre entertainment traveling in the city by bus?* "BUStheatre" is a service allowing street performers and comedians to perform their shows freely on buses giving the user the possibility of spending pleasant entertaining moments during their daily route due to work or other reasons. The project includes also fast food service. Further, in motionless configuration of the bus-system and directly on board, users can watch shows organized and directed by little local theatre companies.
- 7. *BUSbar: how to reach safely entertainment night- clubs and pubs drinking some more cocktails?* "BUSbar" is an aperitif-cocktail and entertainment service directly arranged on local buses meant for the "people of the night" tours. The service promotes and enhances encounters among people and it has been thought to make the traveling of young people safer toward entertainment places promoting at the same time commercial activities arranged for night-fun. The user can book on-line a seat on the "BUSbar" enjoying the service on board which provides live-shows, aperitifs information and discounted entrance-pass for entertainment places.

Services to be added to *Friend-bus* are the following:

- 8. *BIKEadvertisement: how to travel fast in the city without polluting and obtaining at the same time an economic benefit?* "BIKEadvertisement" is an ecological transport service joined to bike mobility. Sponsors wishing to use the bike as a mean of advertisement, are enrolled at the service centre. The local user or the tourist can book the bike on the phone receiving also information on the itinerary maps and on fitness activity to be done on the bike in order to get a better body shape. Therefore, traveling by "sponsored" bike in town, and in proportion to the route covered, discounts and facilitations can be obtained contacting those companies joined to the sponsor-system.
- 9. *TeleBIKE: how to travel fast and get information in the city avoiding the car?* "TeleBIKE" is a service for local ecological transport linked to the use of bikes. The service involves telephone, public and private companies dealing with mobility and communication. By purchasing a telephone re-charging card, the user has the right to pick up a bike, in the local Bus-points arranged in town, equipped with navigator. By introducing the telephone card into the navigator, the user takes the bike and is always updated on the best itinerary, short and safe, to reach any point of the town.

Further, the user is enhanced to drive more kilometers by bike because in this way he/she can accumulate scores on prizes on his/her personal card.

- 10. *CoachBIKE: how to travel with our own bike?* "CoachBIKE" is an inter-modal transport service allowing anybody to travel easily by train with his/her own bike and then, if necessary, by bus too. This enhances to privilege the combined use of light and common means of transport. The multi-modal system is made by connecting the railway system with the public transport network and the city–biking lanes, which allows to tour in the cities without polluting them or provoking cars traffic-jam. The user can book on-line his/her seat and, if necessary, a bike on the train. The service organizes tours meant for tourists, even for groups of users interested in visiting the most beautiful places in town, thus enhancing new forms of socialization.
- 11. *VIDEOoutliers: what to do for not missing university-lessons when traveling*? "VIDEOoutliers" is a service which allows university students to follow lessons from the train in case of delay or on a trip back. The commuters get in contact with the service web site, available in agreement with University, to tell their requirements according to time–tables and courses attended. By booking the seat, each student can attend the class, or part of it, by video-conference downloading it, when necessary, also on his/her hard-disk.
- 12. *InteractiveMAP: how to improve the private car use in town?* "InteractivMAP" is a service allowing easy traveling in the city getting to know new people and sharing transport costs thus polluting less. This is possible thanks to an interactive map system located along the main road itineraries, near the *Bus-stop,* providing information both on public transport network and on the shared car mobility network. In this way, the user can get a further service plus the bus. He/she can share the use of private cars with other local people, when necessary, either for going outside the city or for particular transport situations.

The *Friend bus* system-product

The analysis of services organization and functioning characterizing the *Friend Bus service solution,* has allowed to identify its *key-product:* the "*Friend Bus* System". It is an easy and modular vehicle of public transport, made of specialized and interchangeable mobile units, comfortable and accurate in their inner space, flexible and adaptable to be re-shaped according to the needs and services offered to the users.

As starting point of the project development, the "*Friend Bus* System" brief has defined the specific and general targets of research, the users' needs, technology and functional requirements of the system. The *Friend Bus* System is meant for a larger target than that traditionally related to public transport (students, elderly people, immigrants and low-income people), since it is aimed to offer a wide range of services not only referred to transport but above all related to cultural and social activities. The product requirements are focused on technological and functional features of a public transport modular vehicle, made of interchangeable, flexible units, adaptable to be re-shaped. Information on the latest technology and computer science innovations in this field have been acquainted (miniaturized transmitters, wireless exc.). From the analysis of the present condition it is evident that the development regarding means of public transport is mainly referred to the improvement of mechanical, propulsive and functional efficacy. Generally, the new Buses are characterized by the re-design of their interiors and their bodyworks. Only in the latest years some studies on experimental level have faced the theme of urban mobility according to system terms, providing solutions mainly based on the best computer science technology innovations.

The concept "*Friend Bus* System" is made of a Motor and several Bus Units (BU). The Bus Units are made of mobile Connection Units (CU) and Specialized functional Units (SU). The mobile Connection and transport Units are the parts composing the jointed mechanical system. They contain the access module, useful to disabled people too, and the connection module between the two levels and the single SU. The functional Specialized Units, instead, are true and

real modules differently arranged and equipped in relation to the different services offered: on the first level there are no seats but only supports and equipments are placed in the centre; on the second level, space is made of a large access area and a gallery equipped with seats, terminals and different elements.

The "*Friend Bus* System", projected in this way, allows a great aggregation and functional flexibility. The study has specifically analyzed two possible standard configurations: in motion and motionless.

The system, when in motion, shows long jointed CU "trains" where different SU can be placed. The Specialized functional Units are placed time after time on the mobile Connection Units in consideration of the fitting required. For example, different combinations can be obtained according to specific use requirements by the users, or requirements linked to optimize the service or in occasion of local venues and exhibitions.

The system, when motionless, is transformed in a fitting strolling system, which can be placed in the squares or in the strategic points of the city. The Bus Units can be system-aggregated according to as many as required in relation to the venues organized or the service required. Therefore we obtain a jointed system adaptable to the features of outer spaces. Further, each Unit is connected to the other by means of extensible tunnels, assuring the continuity. In this configuration the Bus-Units offer differentiated use dynamics. The lateral walls of the first level can slide enlarging the inner space creating a series of crossing points; on the second level, the transparent covering can be opened shaping the gallery below like an open terrace. In its whole, the chain of Bus-Units obtained, is a continuous architectural and spatial system articulated on two floors.

The study, in the end, has been focused on the interior design of the different SU to define the fittings and the distributing solutions. The two levels of the Specialized functional Units are connected by inner stairs. They are differently equipped: touch screens assuring the service of the Net-surfing; book-shelves and exhibitors; bike-racks, seats and supports, containers and various distributors. The furnishing is light and characterized by soft shapes and new materials to assure comfort, durability, safety and distributing flexibility. The fitting elements of the interiors are well combined and continuously linked to the panel of the outer covering. An orientation of aesthetic research is obtained, developing the "*Friend Bus* System" language toward organic shapes of contemporary time.

6. Main Results

Friend Bus Service Solution system represents an alternative solution to the traditional urban mobility based mainly on the use of private car. The proposal satisfies the needs of developing a sustainable urban mobility, with multi-modal characteristics capable of reducing environmental and economic costs caused by traffic congestion and, at the same time, favour the regeneration of the social structure through an integrated and differentiated system of collective services.

According to this motivation, the obtained results concern mainly the building of possible scenery of alternative mobility in contemporary city through the description of a sight and some proposals. In particular:

- The pre-figuration of probable city changing, above all thanks to the data processing innovation applied to the problematic area of the urban mobility, that gives the possibility to optimize flows, coordinate exchanges among different means and to facilitate the sharing use of vehicles and equipping. Modified local transport system, according to the alternative mobility, offers new form of routine lifestyle feasible and sustainable;
- The visualization of twelve alternative mobility services. It is about solution proposals to the need of mobility, and to the need of social and economic regeneration for the

local population. Designed activity aimed to the description of management and financial aspects has consented to stress the advantages of the service: optimizing time run, mobility cost reduction, safety increasing, a wider range of socializing and inter-personal relationship developing possibility, rising of wealth and of the contest quality, promotion of personal ability, development and increasing of the economic and commercial activities;

- The concept design of one modular vehicle for local transport, called *Friend Bus Service Solution*, made up of specialized and interchangeable mobile units reassuming according to users needs and wants. The system allows a great aggregative and functional flexibility in order to give aggregative and functional flexibility and can give life to numerous structures, both in movement and in motionless;
- The interior design of the Specialized Functional Units, with particular care for the fitting out and of the not printed distributive in order to favour activities and usage modes linked to different services offered.

7. Involvements

The research has been developed according to a degree thesis in Industrial Design at the Faculty of Architectures in Pescara, G. d'Annunzio University, Chieti-Pescara. The headline of the thesis was: Alternative *Mobile System. Services, Products and Knowledge for the Urban Sustainability.* The lecturer was Professor Antonio Marano, the co-examiner was Professor Giuseppe Di Bucchianico, and the final year student was Alessandro Jovine. The present paper. that reports synthetically the main obtained results, was written by Antonio Marano (exactly paragraphs : 1, 2, 3, 4, 6) and by Giuseppe Di Bucchianico (paragraph 5)**.**

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Personal Rapid Transit. www.personalrapidtransit.com

SkyWeb Express. www.taxi2000.com

TransMilenio. www.transmilenio.gov.co

Fig. 1: The TakeawayBUS service

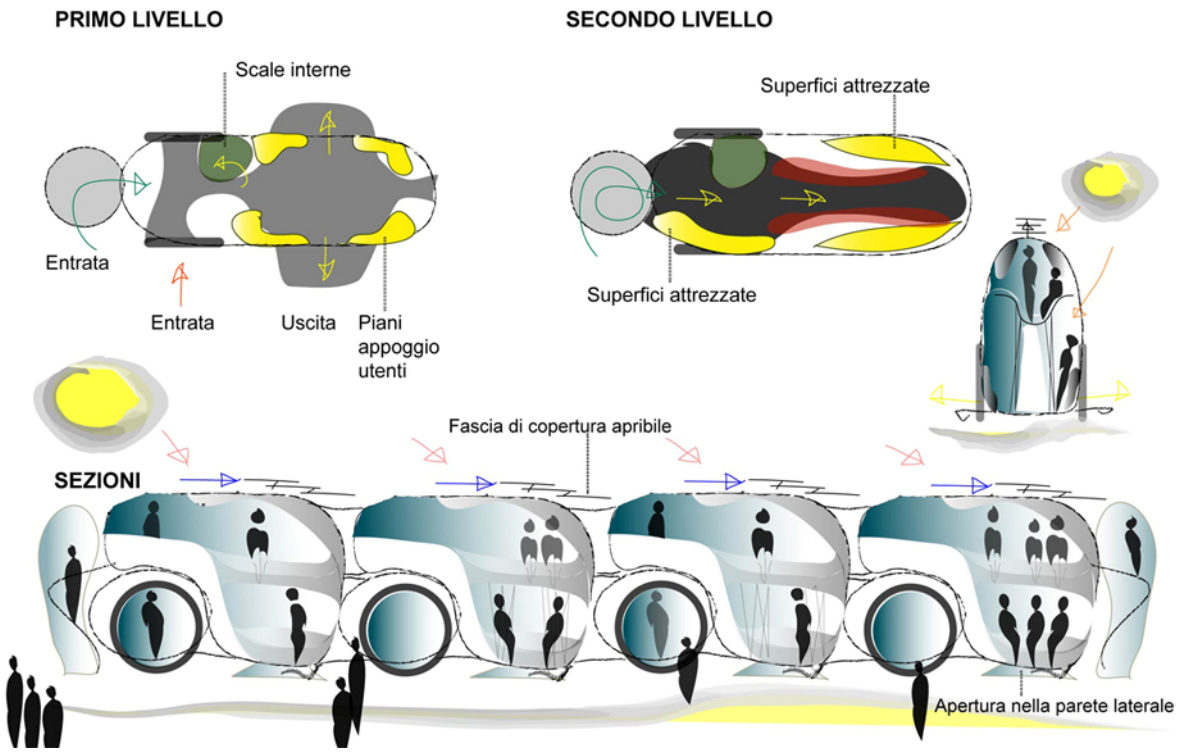

Fig. 2: The concept design of the *Friend Bus*

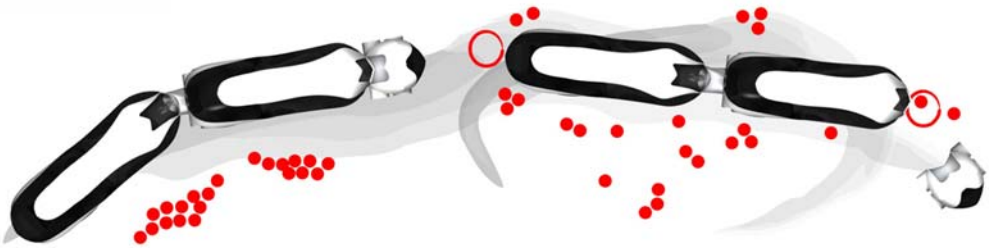

Fig. 3: The *Friend Bus* in motionless configuration

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The sector of household electrical appliances

An integrated system

Gian Paolo Marino[1]

Abstract

Defining future developments of the planning and production concepts, as well as the environmental outcomes of big household appliances (fridges, freezers, washing machines and dishwashers), entails the opportunity to briefly figure out what the evolution in the sector has been like, in the past ten years.

The lapse of time taken into consideration is the one that was marked by an increased need for talking about the issue of product ecocompatibility.

Today we dispose of a number of outcomes that form a very articulated patchwork that has, on the other hand, no “compactness”.

This results in the need for a clear uniform future vision able to lead us towards an operational strategy for tomorrow, in compliance with a shared methodology.

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1. The “out of the box” thinking

A great breakthrough has been made in the last six or seven years, regarding the household electrical appliances; but what now seems to be arguable – maybe in function of the strong competitive advance from the East – is that the scientific community and large size producers feel they need to move proactively towards the total innovation of the sector.

The great studies carried out to improve the overall performance level of large size household electrical appliances has reached a point where most of the optimizations demanded by the market and the Law in the past decade have been achieved.

Nowadays, the market has finer products able to customize washing, optimize energetic and water consumption, without decreasing the cleaning and cooling performance quality, **reduce the use of harmful or polluting materials and many others.** The evolutionary need of the sector has led both research and production towards exploring subjects which, until a few years ago, were looked at suspiciously, as if they conceived by visionary minds.

As opposed to the early trend to focus on the performance improvement of the single electrical appliance, nowadays we tend to evaluate the evolution opportunities of the sector, in relation with the social evolution and man’s wellbeing. That implies considering the user as a main actor playing a leading role within the complex production system. We are giving birth to the first experiments in a systemic, service and energetic reuse in cascade. In short, these embryos of ideas or even these first real innovative applications, are laying the foundation for the future development in the sector.

These productive strategies, however, even though they give concrete answers to different and urgent problems of technical and legislative nature, they propose solutions in a non homogeneous way, as if they were all “watertight” sector.

What is still missing today is precisely the perception that we all need to act following a new operational scheme, exempt from pre-constituted rigid rules, which is able to address the entire productive field towards the attainment of a common virtuous goal.

Researching, defining new concepts and applying them onto prototypes or real objects, is still carried out separately: we are watching the birth of new inquiry sectors, the partial solving of issues which have been, for years, stimulating designers, researchers and industrialists. All this is, however, performed in a single way.

What becomes necessary to do, then, **is to think in alternative ways, “out of the box”**. Until now, the industrial production has always been looked at design in compliance with a planning linear vision. But the world that lies around the realization of a product (whether it is an household electric appliance or any other object), is something that is really much more complex.

The current productive regulation of linear type needs to be rethought accordingly to the evolution of the environmental, use, productive, competition and global markets complexities.

This regulation has to be readdressed towards a systemic vision.

What we need today is a sort of strategy which will be smart enough to manage all these complexities, **because we all know that every serial product can actually be regarded as an interrelated and complex component system and that the final system-object is the addition of every constituent subsystems the system-object itself is made of.**

2. A vision by components

The matter of design by components is a current investigation field particularly appealing to the designers who are asked to take part in the planning of lifelong durable goods (e.g. fridges,

freezers, television sets, computers, etc.). Such an interest has been particularly vivid in Europe especially since the introduction of two recent directives, one limiting the use of certain environmentally dangerous substances inside the appliances, and the second one regulating waste disposal (namely the 2002/96/EC *WEEE-Waste Electrical and Electronic Equipment* directive and the 2002/95/EC *RoHS-Restriction of Hazardous Substances* directive).

But this kind of interest is not sufficient to explain the operative, design, industrial and managerial complexities involved by the realization and marketing of a product. **The final product** is something that goes beyond the mere material and technological concreteness: it **is a real product-system that involves more than one operative competences and that puts into action a series of links between the physical place of production and all the parallel systems that encircle it.**

It is therefore necessary to begin with an awareness and a second consideration of the whole system components if we aim at a better understanding and plan new global strategies.

As far as the industrial products are concerned, reconsidering a system implies the analysis of the possible planning, economic, productive and environmental advantages, as all these activities are strictly related one to each other.

Like when playing dominos, we need to trigger with decisiveness and awareness the fall of the first pawn, after having patiently and ingeniously arranged the total system generated by every make up of the initial planned scheme.

The abstraction proposed by a type of design made by components – at first of material and technological kind and then of managerial and environmental quality – **makes the whole problem easy to read and analyse** (within a logical inclusion of all cultural and scientific contributions), not only by the individual designer, but also by other experts who are called for to partner him: the emerging scenario shows the features of complexity, rather than a disciplinary closure.

The question now is the following: what do we mean with the term “Design by Components” with regards to industrial manufacture?

In brief, **Design by Components**[2] **is the planning of all those intrinsically interrelated elements (namely, components) making up the system-product.**

Each system-object is, in turn, considered to be an integral element (that is a component again) of a more complex system, which may involve non only the productive realities but also those ones related to the territory, the economy, the environment as well as the society.

The Design by Components is a strategy/methodology of design developed, since fifteen years now, inside the *Politecnico di Torino* through an intense research activity mainly focused on the sector of household electric appliances that has already lead to interesting result, as we will see. It is necessary to remember that such a strategy is moreover extensible to other product categories, by virtue of its own nature of adaptability, if every industrial product is considered as a system which is, in its turn, considerable as to be a part of a more complex system.

When we talk about Design by Components we do not only make reference to the planning of the parts (both external and internal) an industrial product is made up of, as we may perceive after a first superficial reading, but we also make reference to the underlying reasoning about the system that encloses the product of which it is part and parcel.

Design by Components is, to all intents and purposes, **the up and downstream conception/planning existing behind and throughout a more complex process** that looks at the finished product as the concrete exemplification of ideas, thoughts and the more diverse

[2] For more details about the “Design by Components” methodology, please see the following papers:
Virano, Andrea. *DESIGN BY COMPONENTS. An operative methodological tool for the ecocompatible industrial design.*
Cozzo, Brunella. *MACROCOMPONENTS. An alternative proposal for the production of home integrated systems.*

strategies, all entangled and interrelated one another, in strict connection with the life cycle of the designed item.

3. The system: a new kind of design approach

It is certain that defining future developments of the planning and production concepts, as well as the environmental outcomes of big household appliances (fridges, freezers, washing machines and dishwashers), entails the opportunity to briefly figure out what the evolution in the sector has been like, in the past ten years. The lapse of time taken into consideration is the one that was marked by an increased need for talking about the issue of product ecocompatibility.

Up to the present, the diverse and complex research has been mainly focused on sartorial studies such as energetic optimization, innovative materials and performance improvements.

Today we dispose of a number of outcomes that form a very articulated working platform that has, on the other hand, no “compactness”.

This results in the need for a clear uniform future vision able to lead us towards an operation strategy for tomorrow, in compliance with a shared methodology.

Such a strategic vision unavoidably requires a change of route and, at the same time, that **the realization of an open system cannot more prescind from the fact that every actor involved by the productive chain is tied**, more than ever, **to another and that everyone must act in synergy accordingly to the concept of shared responsibility.**

Acting in agreement to this principle of “duty sharing” is not only an idea in progress but a pre-emptory concept that is pushing forward. Until a few years ago most of the states belonging to the Northern side of the world (namely the “consumerist” ones) had huge difficulties relating to the environmental subject. Apart from Europe, today the United States also have finally had to confront and admit the seriousness of the consequences raised by the enormous waste of the planetary resources, and this has inevitably caused us to be proactive, without waiting for the others to make a first move.

Designers, manufacturers, legislators, economists and not least, the end users, are the actors starring in this articulated “role-playing game” where rules have not been clarified yet.

The lack of clarity is mainly due to the fact that each actor thinks and acts to his own advantage: designers prioritise shape and functional management, manufacturers focus on investments and profits, legislators are in charge of tackling contingent problems. Users, on the other hand, expect greater comfort and premium quality, as well as competitive prices, leaving the solution of problems in other hands.

We need to understand that all the entities involved, are not separate parts, but intrinsically related elements, which are part of a complex tangle of relationships. For such reasons, a holistic approach to these problems will explain how the accomplishment of any system (in this instance that being the one of the industrial object) is strictly related to the bond existing among the actors who operate on the same level, making a synergetic attempt to achieve the final success, either from a planning, industrial or economic point of view.

The winning product is the one prioritizing the ecosystem.

In this system designers are given a starring role. They are asked to design lifelong durable goods with a lower environmental impact, as well as unalterable performances, aiming to achieve a uniform obsolescence of all materials and components. An equally important role is awarded to producers, those in the industry and financially responsible for the waste disposal of electrical and electronic appliances during the whole cycle, up to the collection centres and the final processing.

Moreover, an equal prominent role is also given to all those characters who, in some way, are directly or indirectly responsible of the management of inputs and outputs of any product from the beginning to the end of its life-cycle, in relation to those parallel systems that "nourish" the product itself or that from this latter draw the proper "nourishment".

A similar kind of scenario requires all the actors involved to have open-minded technical, strategic and ethical skills and abilities, to be receptive towards new uses, tolerant and willing to transfer know-how from one sector to another, free from all sorts of preventions and provided with all-accomplished supplementary creativity.

The data gathered from the monitoring of the sectors of small and large size home appliances which has been carried out in the last fifteen years, clearly show the road to be travelled in the future. The real novelty in the evolution sector is the one offering new open systems (where system outputs become other system inputs), enabling the relationship between the production world, the territorial and social-economic contests, the final consumer and, consequently, with the environment.

Being able to move confidently within such a complex system and, consequently, submit a joint strategy action, entails clearing one's mind, refocusing on the objectives, paying attention to the salient points that have led the innovation process of the large size home appliances in the last period of time.

4. Future development of the sector

The possible future vision is, then, **the one suggesting looking at the whole home appliance sector (and also all the other industrial production fields), under an integrated system point of view**, providing for each product not to be analysed individually, but as part of a much more complex chain, aiming to make requirements concrete and to perform in compliance with a much wider scenario[3].

Here below you'll find a possible evolution key thematic map to be faced in the forthcoming future, about:

environment

- quick adaptation skills of manufacturers to the current and future environmental rules;
- development of the idea of total integration of large size home appliances with the house water and energy supply systems;
- evolution of the reuse principle in cascade of water and energy resources which would be, otherwise, dispersed in the environment.

technology and industrial production

- improvement of the relationships occurring within the manufacturer/consumer chain, by means of the very object;
- increased efficiency during the product assistance and maintenance phases;
- overall adjustment and improvement of production systems with regard to systemic complexities deriving from the extremely articulated contemporary and future society;

[3] For more details about the "Systemic Design" vision, please see the following paper: Bistagnino, Luigi. *SYSTEMS DESIGN APPROACH.*

- development and application of wireless technologies in the service of the “ubiquitous community”, used to perform distance check of appliances (applied domotics), carried out by manufacturers and customers;
- promotions of basic and applied research to define and solve current and future problems;
- further improvement and adaptation of the technological evolutions that have been achieved until now (energy saving, noise reduction, optimal choice of materials used in relation to life-cycles), to the new systemic production perspectives.

house and society

- encouragement of cleaning and food preserving systems and services, inside town apartment buildings;
- optimization of large size home appliances, in relation to the need of diversified house space;
- focus and adaptation of the sector to the social changes with reference to the urban, suburban and rural territory.

Thinking in terms of integrated systems is undoubtedly the strongest form of innovation, an innovation which will be able to lead to a radical change of products, as strongly opposed to the mere carving of individual parts.

If we wish to achieve such a goal, we will strongly need to think:

- **that every product component will play a leading role in the future systemic development;**
- **of integrated production systems, instead of individual product chains;**
- **that the whole sector will have to be geared at supplying services in compliance with the evolution of social, economic, territorial, environmental and housing backgrounds;**
- **that the whole product park will be run aiming for a higher maintenance quality level;**
- **the production process evolution will no longer focus on the end-user company but will involve the renewed role of component designers.**

In order to boost such a modification in the current product strategies, would be necessary to move the barycentre of productive/economic interests towards a progressive rebalancing of the collaboration policies between companies, also in the case they are competitors.

A similar groundbreaking vision of the industrial world, would surely lead to a revolution of the operating strategies and positive relapses and benefits in terms of environment, economy, production and design:

environment

- to grant any kind of allowances for the firms which:

        - adopt end-of-life strategies for its own products;
        - develop new antiwaste strategies (e.g. raw materials, energy, etc.);
        - respect and apply the ecodesing guidelines;
        - conceive new monitoring and controlled checking systems;
        - develop new planning teams which may suit the new environmental demands;
    - to create a context-free legislation regulating ecosustainable planning of the product, and not just to a part of it (as it usually happens with the energetic improvements made in household appliances, in the occurrence of a planning stagnancy of the whole product);
    - to sensitize the society towards new ethically correct production strategies and new product aesthetics;
    - to support small/medium size entrepreneurs when creating and consolidating alternative markets.

economy

- reinstating jobs that were lost, by boosting maintenance of the product park throughout the use phase and the strategic management of the end-of-life cycle of products;
- rebalancing markets (refocusing production on the end user and reconverting offshore production into a new end-user, being productively identical to the initial market or totally diversified, nevertheless in line with the local economy);
- planning or revaluating a product rental service;
- promoting or launching alternative markets (eg. Second Life Markets).

production

- differentiated serial production as a mark of distinction, personalization and an added competitive value;
- revising processing cycles (which are probably more complex than the current ones);
- planning new strategies for:
    - EcoFriendly production system management;
    - planned end-of-life cycle dismissal of the product;
    - controlled distance maintenance;
- constant confrontation with production realities operating on a competing level, being alike or totally unlike one from the other, in order to boost mutual improvement, not only to compete;
- sensitizing planning teams towards:
    - simplifying connections (e.g. standardized interfaces, uniformed checks and programmes);
    - rethinking about components;
- disassembling procedures (still to be invented, through the preparation of suitable information system devices or other tools);

- assembling procedures (easier than the current ones, if everything will be planned ad hoc).

design

- rethinking about a creative process free from mere functional and formal preconceptions;
- predicting the technological updating of the product;
- proposing a new aesthetics for component-based products;
- enhancing links between users, object and industry;
- configuring the overall scheme of the uniform obsolescence of all the components;
- acting in integrated systems and not in individual parts;
- introducing the operational functionalities of a product inside the system where they occur and relating them to it;
- considering generated outputs as inputs, so as to reuse them in the surrounding context.

5. Changing the rules: integrated systems design

In the light of these observations, we will be able henceforth to act with the awareness that **all household electrical appliances are part of an integrated system (with the territory, the society, the environment, the residential units, …)** and that **they are not the mere single pieces of each production chain**, so as to originate the new product design conception of tomorrow.

On the basis of the above mentioned principles of integrated systems design, it will be possible to imagine that:

- **the fridge will need to be placed within a "food nourishing and preserving system";**
- **the dishwasher will need to be integrated in the "food cooking and eating system;**
- **the washing machine will not only have to be conceived exclusively to wash clothes, but designed as part of the "washing system".**

All these systems, bounded one to the other with a double thread by the idea of daily life (buying-preserving-consuming food, dirtying dishware, tablecloths, clothes, etc.), are in turn likely to be integrated one within the other. If each appliance is reanalysed and reconceived as the ring of a chain, and not as a separate element, we will be able to reach the goal successfully, that being the updating and evolution of the sector altogether.

Innovative ideas such as these already have some proponents in the industrial sector. During the conference *"Cambiare le regole – il settore degli elettrodomestici: un sistema integrato"* (*"Changing the rules – the household electric appliances sector: an integrated system"*) which was held at *Politecnico di Torino* in collaboration with *CECED Italia*[4] in early May 2008,

[4] *CECED Italia*: association representing the household appliance industry in Italy. It is part of the European network *CECED* (Conseil Européen de la Construction d'appareils Domestiques, namely the European Committee of Domestic Equipment Manufacturers). *CECED Italia* supports the development of the sector by activating the more effective measures in order to strengthen the positioning

Italian household appliance and component manufacturers demonstrated a strong commitment to working together to tackle the evident stall in the economy which is affecting the whole sector.

Asia's growing presence in the global market, the environmental emergencies, the impoverishment of natural resources, the strict European legislation and the overall decreasing quality and safety levels of competing products are urging industrial figures such as *Electrolux*, *Whirlpool* and *Indesit* to modify their own manufacturing strategies.

During the conference it became clear that there is a strong motivation to restore the dignity of products which are "Made in Italy" by viewing household appliances in this new manner, as integrated systems.

Among the several suggestions proposed then, it is worthwhile citing that one about the possible future re-conversion of great disused productive spaces into new places where it will be conceivable to produce reduced/required numbers of products, instead of the current large quantities; on demand, customised products to be realized with mature components by specialised staff which will be able to give the projects, once again, that special "handmade touch" which is a distinguishing element of the Italian design tradition.

The idea is to develop manufacturing plants in which more than one concurrent companies will allowed to use the same components which will be directly produced on site or in nearly placed production plants.

A similarly innovative manufacturing strategy using "integrated systems clusters" would permit greater efficiency in the monitoring and handling of both up and downstream processes, thereby reducing wastage of raw materials and energy. This type of strategy also means that larger numbers of producers, component manufacturers, designers and technicians could work together in accordance with the above mentioned principles of shared responsibility, with the aim of combining the synergies of multiple industrial powers to improve overall quality through an increased focus on customer service and environmental awareness.

This sort of revolution of the industrial mentality will certainly be neither easy nor immediate. In the years to come, it will be necessary to predict and plan all the constituent parts of a product, their materials, duration, replacement and all there is to know about the life cycle of an object. Indications are still rather uncertain, technologies and materials keep on changing a lot faster and more deeply than social, cultural and production changes.

Facing the infinite opportunities offered by technological innovations, industrial culture and design will point out the need to assume our own responsibilities, as being able to choose forces us to plan at the same time all the variables that are part of production and dismissal of the objects on many levels.

In conclusion, it is mostly up to the large size industries to make the sharpest change and to drift away from the logics of goods designed for the end markets, by focusing on the technical and quality evolution of components and by changing the production rules in favour of systemic strategies deeply integrated with their own territorial, social and economical contexts.

of Italy – which is one of the world-wide leaders in this line of business – within the international market. The association actively promotes the dialogue among all the Italian interlocutors as well as, together with *CECED*, between these latter and the national manufacturers and the rest of the European/international Institutions.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

MetaCycling

Extending Products' Life Spans Using Virtual Communities and Rapid Prototyping

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Abstract

This research paper introduces the MetaCycle project, which aims to optimize the creative potential of designers by reuniting them within a virtual community serving the common objective of prolonging the life span of consumer products. The goal of this virtual community is to develop an interactive framework through which consumers can benefit from unique and innovative updates to products that are reaching the end of their useful life. Relying on the exploitation of Rapid Prototyping (RP) technologies, the pooling of a large number of creative minds also allows the generation of a new category of unique products. This paper covers the theoretical and practical aspects of establishing an appropriate web interface for the creation of a Metacycling community.

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1. Introduction

For the last forty years, many critics have voiced concern over the damaging effects that the growth of consumerism was having on the world's ecosystems. A number of insightful designers were particularly present among these activists decrying the wasteful habits of industrialized countries and criticizing their underlying values. Representatives from the various design disciplines have been pointing out the fallacy of the idea of progress as being dependant on unending growth and in demonstrating that increased exploitation of the natural world without regard to impacts on the environment will inevitably lead to both depletion of non-renewable resources and poisoning of the planet through increased production of toxic pollution. Jane Jacobs argued that architects were destroying the ecology of the built environment through the promotion of urban sprawl (Jacobs 1961). Victor Pananek leveled his criticism directly at designers themselves (Papanek 1984). He accused the profession of being instrumental in the suicidal race towards ecological disaster by contributing to the relentless rise of consumerism. At an even earlier date, Buckminster Fuller, through his writings and his innovative projects, argued that engineers and architects should adopt building methods based on those of the aircraft industry (Fuller and Meller 1970). He proposed that these could economically and efficiently replace traditional building crafts in the creation of shelter for all.

Progress has been made since then, but not sufficiently to offset the increased demand of developing nations. In this new context, designers need to play an ever more important role in putting forward proposals for changes that will increase the efficiency of our means for production and reduce the negative effects of society's excessive consumption.

Today, several promising initiatives have been proposed to tackle the problems engendered by increased consumption of durable goods. The term durable, used to qualify products meant to outlast a single use, has in fact become inappropriate to describe the vast majority of industrially produced consumer goods. While these may be categorized separately from "throw-away" products, they are anything but durable and all too soon find their way to the trash bin. So far, most of the proposals meant to increase product longevity, revolve around the concept of re-use, which considers used products or parts of products as potential raw material for new products. Websites such as Reddish Studio (http://www.reddishstudio.com/furniture/ bathandbeyond01.htm) and Design WS (http://www.designws.com/pagina/1jorre08.htm) present the results of creative efforts aimed at finding a new use for old parts, while "Can You Recycle This" (http://www.recyclethis.co.uk/) not only solicits solutions, but also suggestion of products in need of being re-used. Re-use also has its niche markets; Ikea Hackers (http://ikeahacker. blogspot.com/) showcases new uses for used Ikea products. The principal advantage of re-using as opposed to recycling, where products are disassembled and channeled back into the stream of raw material production, resides in the retention of the material's physical and chemical properties as well as its geometry (McDonough and Braungart 2002). These dimensions can collectively be considered as embodying "design intention" and represent value, which is lost in the recycling process. Their conservation, however, imposes severe demands on the creativity needed to build these parts into a new product.

The originality of the Metacycle approach is in the application of digital technology, particularly that designated under the term "Rapid Prototyping", as a means of facilitating the re-affectation of old products to new uses. It is along this axis that our

research efforts have been directed, linking various digital technologies with modern social phenomena in an effort to prolong the life span of manufactured products and thus reduce the deleterious effects of over consumption.

Rapid Prototyping (RP) defines a number of different technologies that share the capacity of producing three-dimensional, geometrically complex physical shapes directly from a computer modeled 3D digital file (Burns 1993). Typically produced with 3D Modeling software, a file describing a part is sent to an RP machine which “prints” the object, layer by layer, without any human intervention. Developed over the last twenty years, a half dozen technologies have reached commercial maturity, each one operating according to different physical and chemical principles and each one producing parts in a different range of materials including various thermosetting and thermoplastic resins, metals, sand, wax and plaster. These RP technologies are principally employed for the production of models used in various phases of new product development. However, a small and growing area of application is in the production of parts for final use. This is the domain occupied by the Metacycle project, which proposes that parts produced by RP technologies could be used in conjunction with existing parts from used products in the design of new products.

The premise at the root of this research concerns the organic nature of manufactured objects; like living things, objects can change over time. Jonathan Chapman considers that a product’s life span is determined in large part by the attachment linking it to its user and that this could be enhanced by the product’s ability to evolve and change over time (Chapman 2005). While this ability is often seen in the area of software design (Winograd 1996) where updates, patches and versioning enable programs to evolve not only to correct errors but also to meet new needs, some researchers, such as Neil Gershenfeld (Gershenfeld 2000) and Donald Norman (Norman 2005) have made attempts at transferring this aptitude to physical objects.

This paper describes research aimed at establishing a network of designers applying their creativity to proposing how existing objects could be enhanced and modified in order to take on a second life. In previous work (see http://preco.ca), the researchers established the feasibility of using digital manufacturing technologies and in particular RP for repairing products. They took this to a second level in META[morphose] (Lalande and Racine, 2006) by experimenting the application of RP to the up and side grading of products, thus enabling them to evolve. Metacycle configures this technique into an operational framework by creating a virtual community of designers linked by their common interest in the creation of new products from old. This process of mass canvassing, dubbed “Crowdsourcing” by Jeff Howe, one of its earliest proponents (Howe 2006), challenges the authority traditionally accorded to individual experts and, in its place, sources a wide basin of unfiltered talent in the quest to solve difficult design challenges. Used extensively by commercial enterprises such as IBM and Dell (www.DellIdeaStorm.com), virtual communities are a growing phenomena that transcend strictly economic imperatives to include political, social and even ludic activism (www.thinkcycle.org, www.facebook.com, www.secondlife.com).

2. Methodology

The methodology used was a form of action research. It is through this design project that it is hoped to better understand the implications of attachment between users and objects. By asking people to participate actively in the design of second lives for their everyday possessions, information will be gathered pertaining to the benefits and the limits of a community approach to eco-design and the value of the internet for fostering user participation in the design process. The Metacycle website is intended as a research project on collective sustainable initiatives. Thus, it is proposed to make “Metacycling” a verb of action.

To create this creative community focused on giving a second life to everyday objects, the first task was to design the website in such a way that it could accept and manage the creative ideas of the public (Figure 1). For this, an area was developed called the Design Lab where users could actively participate in the design process. In order to get a quick overview of what this project implies, participants are first invited to the Explore Ideas section where they can browse concepts that have already been submitted (Figure 2).

At the same time, this section enables voting on a scale from 1 to 5. Not only is this the first possibility of active participation, it is also a means of better understanding what the crowd considers a strong Metacycle idea. Additional information can be obtained on each of the ideas presented in a full-page detailed description.

After satisfying their curiosity, users move on to the Solve Challenges section of the Design Lab which presents 10 objects that are Metacycling challenges. The Metacycle team carefully chose 10 difficult to recycle objects: toothbrushes, VHS cassettes, hockey sticks, computer mice, swimming goggles, markers, flashlights, Walkmans, cell phones and thermoses. After having chosen a challenge, additional information pertaining to the size, materials and other characteristics of the object is presented with a reminder of the Metacycle guidelines: “Revitalize Functionality, Maximize Reuse, and Reduce Waste and Energy”. After having accepted the Creative Commons terms for the non-commercial use of their ideas, users can submit their images, models and/or instruction manuals. This content is automatically uploaded into the Explore Ideas section for others to browse and vote upon. If ever an idea gathers a large amount of positive feedback, the Metacycle team will promote it into the third and final section of the Design Lab labelled Featured Solutions.

A MetaAward logo is apposed to the idea profile and depending on the design development required, a possible production is envisioned with Rapid Prototyping technology. In summary, the Design Lab helps participative users along the design process in going from inspiration by exploring ideas, to ideation in taking on a challenge, to production of a featured solution.

On another front, the Metacycle website documents the foundations of the research. This second part of the website presents the background information and the goals supporting the efforts invested in developing the Metacycle project. Not only is it oriented towards other researchers who wish to learn more about the Metacycle project, but more importantly, it is intended to inform the creative users who are attracted by the participatory nature of this project. In one section, information about the earlier research efforts in Préco and Metamorphose is provided as well as the background of the research team. Another section presents the lab facilities and the technologies that have been used throughout these research endeavours. The eco-design section showcases the evolution of the environmental practices. The past was characterized with the idea of the 4 R’s: Reduce, Reuse, Recuperate and Recycle. Present-day strategies emphasize sustainable product development like design for disassembly and life cycle analysis. In the future, not only will the tools of the present help create more sustainable products, but also, design research is seeking ways to increase the emotional relationship between products and their users. The research aspect of the Metacycle website ends with technical, ecological and licensing guidelines to help participants optimize their design efforts. Primarily, the research section aims to inform and encourage participants so they can engage themselves into the Metacycle initiative.

The launch strategy of the website contains three distinct stages: the pilot project, the soft-launch, and the official launch. As the pilot project, several groups of design students were asked to upload ideas and suggest interface improvements. This proved

to be a valuable source of feedback for the Metacycle team on two different levels. For one, the students were able to assess the clarity of the information presented and the usability of the website interface and secondly, the Metacycle team was able to evaluate the presentation and content of the uploaded solutions. This pilot project led to numerous interface improvements and provided the validation that on a small scale and with a controlled sample, the website was an effective tool to collect promising second life design ideas.

To launch the Metacycle project on a wider scale, the Metacycle team will hold a design competition entitled, *Ideas Wanted.* This competition will act as the soft-launch of the Metacycle website. The competition will be promoted internationally to most design and creative communities using the Internet as the principal pipeline. This will be the first time that the general creative public is asked to join the Metacycle community and participate in the project. The primary goal of the competition is to start nourishing the growth of the Metacycle community and to encourage participation in the Metacycle design lab. The secondary goal of the competition is to have a Metacycle success story - an idea that was initiated as a result of the Metacycle project and that shows promise to revalorize a large quantity of objects.

The competition asks users to choose one of ten selected objects and to transform it into a new, functional and eco-responsible product. The only imposed restrictions are that the concept must be original to the participant, it must be posted in the Metacycle design lab, and the presentation must contain at least one descriptive image. Otherwise, despite encouraging near-professional design caliber and graphically strong presentations, all ideas will be accepted regardless of level of development, clarity of presentation or form of communication (sketch, computer rendering, photograph or other). As soon as the idea is posted to the design lab, it will be visible in the explore ideas section where participants will have the opportunity to see all previously posted entries as they brainstorm and develop their own idea. Furthermore, the public can rate the uploaded ideas so participants will be able to see which concept is the current public favorite. This should bolster the participants' motivation to submit competitive concepts.

Once the competition is closed, however, the official winning idea will be chosen by a jury, independent of the public vote. The ideas will be judged on four main criteria: functionality, the new object must respond to a real need; ecology, the transformation leading to the new product must reuse a maximum of existing materials, produce a minimum of waste and require as little energy as possible; creativity, the proposed idea must be original and elegant; and feasibility, it must be possible to develop the proposal within the context of today's economics and technologies. As the grand prize, the winning idea will be developed by the professional designers of the Metacycle team and a physical model of the concept will be produced, a service valued at more than $15,000 CAD. Because all commercial rights will remain the property of the participant under the creative commons non-commercial license, the winner will then be free to exploit his or her professionally developed concept as they wish.

It is hoped the soft launch will generate a wealth of information for the Metacycle team. The ideas posted to the site will begin to reveal the nature of the content that can be expected from community design participation. The community will show whether they are more inclined to describe their ideas with a simple sketch, or display a 3D model of a component that would need to be rapid prototyped, or even post pictures of an idea they have already executed. Also, the success of the promotional strategy, competition format and incentives for participation will be evaluated. The results should offer valuable information for development of the official launch which will be a high profile competition slated for the fall of 2008. Lastly, the nature and quality of the submitted Metacycle ideas will be analyzed to evaluate the commercial potential that the

Metacycle community holds and to nourish a reflection on possible business models for the project. One of the goals of the Metacycle project is to create a long term, self-supporting initiative; one which is commercially, ecologically and socially viable.

3. Results

One of the principal qualities sought of the ideas submitted by the Metacycle community is design integrity. Particular attention was focussed on attaining this goal both in the design of the website interface and in the identification of the initial target audience. While the site does offer some guidance for participants in terms of RP technology and the satisfaction of user requirements, the level at which this information is provided is aimed at encouraging those with at least basic design abilities and aesthetic sensibilities. A second factor mediating in favour of design quality is found in the initial Metacycling examples posted on the website. The thirty-three proposals with which the site was seeded originated from design students and design professionals.

They were developed over a two year period as part of the research project prior to the launching of pilot version of the website. Betraying their origins, they all show an advanced degree of design definition which, it is hoped, will influence the quality of future content. The effectiveness of these levers in maintaining a satisfactory level of design integrity in the pilot project will be one of the factors which will be closely evaluated before opening the site to a general public. The researchers seek to attain a just equilibrium between an open access to large numbers of participants and a high degree of design integrity in the solutions proposed. A final controlling mechanism geared at promoting design quality is found in the third section of the Design Lab, labelled Featured Solutions. This area will showcase mediated solutions offering the most promising technical, aesthetic and ecological features. The Metacycle team will have full authority in the selection of solutions highlighted in this section in spite of the ratings compiled from public voting.

A second factor which will be attentively examined as a result of the pilot project is the size of the development gap to be filled in bringing the conceptual Metacycling proposals to eventual production as valid solutions. This gap is particularly important in view of the objective of assuring the Metacycle community with long term stability. It is recognized that this objective is strongly dependant on the implementation of an appropriate business model which will undoubtedly rest on the exploitation, in one form or another, of the proposals generated by the Metacycle community. Initial examination of the seed projects has led to variable results in this respect. The feasibility of some proposals would appear considerably uncertain while others would seem very easily put into production. The narrowness of the development gap will probably be a variable to be factored into the selection of proposals to be included in the “Featured Solutions” section.

Initially, all ideas submitted to the Metacycle website are subject to a Creative Commons intellectual property license that permits idea remixing and/or redistribution for non-commercial purposes only. The purpose of this license is to encourage the promotion and use of the open source design content available on the website while at the same time reserving commercial rights to the originator of the idea. The rights to any added value would, of course, be retained by the author. In other contexts there have been examples where well known brands have forbid the resale of their products if the original intended use has been altered. Despite presently not intending to sell Metacycled objects on the website, the Metacycle team will respond to such action, should it arise, on a case by case basis.

Any initial business model will be designed to evolve as the website and Metacycle initiative grow and develop. The principal goal of the Metacycle community is to provide an interactive framework in which designers can help each other and their fellow users to benefit from innovative, open source designs revitalizing their end-of-life

products. Originating as an online framework, it is envisioned that Metacycle participants eventually interact outside the alternate reality of the internet and come together at Metacycle design expositions or interactive design fairs. Certain ideas may be recognized as having enormous potential if properly executed on a larger scale, possibly Metacycling thousands of otherwise useless objects. In such situations, any potential commercial value and appropriate action will be evaluated accordingly. Business models based on crowdsourcing design content are currently being tested by such sites as http://ponoko.com. Aside from commercial exploitation, Metacycle could be supported by partnerships with companies who recognize the importance of extending the useful life of their products. Recently, Citroën sponsored a design competition that asked designers to transform 3D components from its cars into new designs of everyday objects (http://www.aedo-to.com/citroen/eng/index.htm). Such companies could use the Metacycle community as a tool for reducing the environmental impacts of consumption. The Metacycle emblem, a stylized butterfly, embossed on a product, might one day remind consumers that a second life for the product in their hands is but a few clicks away at Metacycle.ca

4. Conclusion

The objectives of the Metacycle project are to limit the extremely negative environmental impacts caused by prematurely discarded products. In a recent study by the Québec Provincial Government (see http://www.cyberpresse.ca/article/20080226/CPENVIRONNEMENT/802260835/6730/CPACTUALITES), it is noted that 59% of all electronic apparatus end up in landfills, 20 000 tons in 2004. This trend is accelerating every year as products are becoming ever cheaper and are offered in an ever wider range of styles and colours. At the same time, the lifespan of electronic devices is getting shorter as new features are being introduced on a monthly basis. Once in landfills, these products contaminate soil and water with toxic chemicals including lead, cadmium and mercury.

In an increasing number of countries, governments are introducing legislative measures to force manufacturers to take back and recycle their products after their useful lives. This is good news, but those measures will take time to implement and only target electronic devices. We need an alternative to the current "throw away" model applied to all the types of products we use in our daily activities. Metacycle is a search for such an alternative, encouraging designers to look at discarded products not as waste, but as a resource for developing new useful applications and thus extend their life-span.

Although the Metacycle initiative is based on positive ecological principles, it has its limits. Over-consumption and planned obsolescence are not directly diminished. Metacycle could be perceived as attempting to find solutions once the problems have occurred, instead of addressing the issue of creating sustainable products in the first place. This type of initiative should definitely not prevent designers and manufacturers from attempting to create products with less impacts on the environment, "from cradle to cradle" as McDonough and Braungart would suggest (McDonough and Braugart 2002). In spite of these limits, Metacycle sends an implicit message, which is to underline the irresponsibility of discarding products that still have the potential of being useful, playful and ingenious. It relies on creativity and social exchange to stimulate innovative practices and positive behaviours. It can be used as a tool enabling the general public to give a second life to products and encouraging sustainable consumption.

Moreover, giving the general public access to Rapid Prototyping technologies is one of the unique aspects of the Metacycle project and makes it clearly distinct compared to other initiatives, which generally favour the "Do it yourself-DIY" strategy in order to give second life to discarded products. Our previous research project (Meta-

morphose.ca) led us to evaluate positively the benefits of RP for generating 3D parts. For example, we have exploited the potential of RP to produce joints that adapt perfectly to the form of existing objects. Therefore, we can imagine creating RP parts that could connect a number of plastic pieces together in order to create new objects, such as lampshades or construction kits. Very often, we have noticed that the challenge behind the reconfiguration and reuse of existing products is to connect pieces that have different and complex geometries and that were not initially designed to be assembled to other parts or products. Thanks to their facilities, the Metacycle team can produce parts using their own Rapid Prototyping lab and send them by mail to the interested users who will place their orders on-line. Eventually, as the Rapid Prototyping services expand, people will have the option of downloading the 3D model directly from the site and have it produced at their local RP service bureau.

Undoubtedly, RP has immense potential and opens a whole new opportunity for the reuse of objects. The main challenge however, is to communicate to non-designers the principles of Rapid Prototyping and its different technologies (STL-stereolithography, FDM-Fused Deposition modelling, SLS-Selective Laser sintering, etc.). It is clear that such techniques are still quite uncommon for the general public, while a majority of people still ignore the sole existence of such technologies. This is why the team of professional designers behind Metacycle is key to support the site. The team's role is to seek the most interesting and creative concepts with the help of the public's vote, and to develop the potential of a posted idea. For the benefit of the Metacycle project, it seems important to focus on innovation and avoid having the technical aspects of RP impose a limit on the creativity of the virtual community. As the site evolves through time, it is hoped that a number of successful projects will be developed and then featured on the site. In the long term, those featured projects will help the public understand the potential of RP and educate the users with regard to this new technology for extending products' life spans.

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Fig. 1: *The home page of the Metacycle website puts the emphasis on the "design lab" where designers are invited to participate in the process of giving products a second life.*

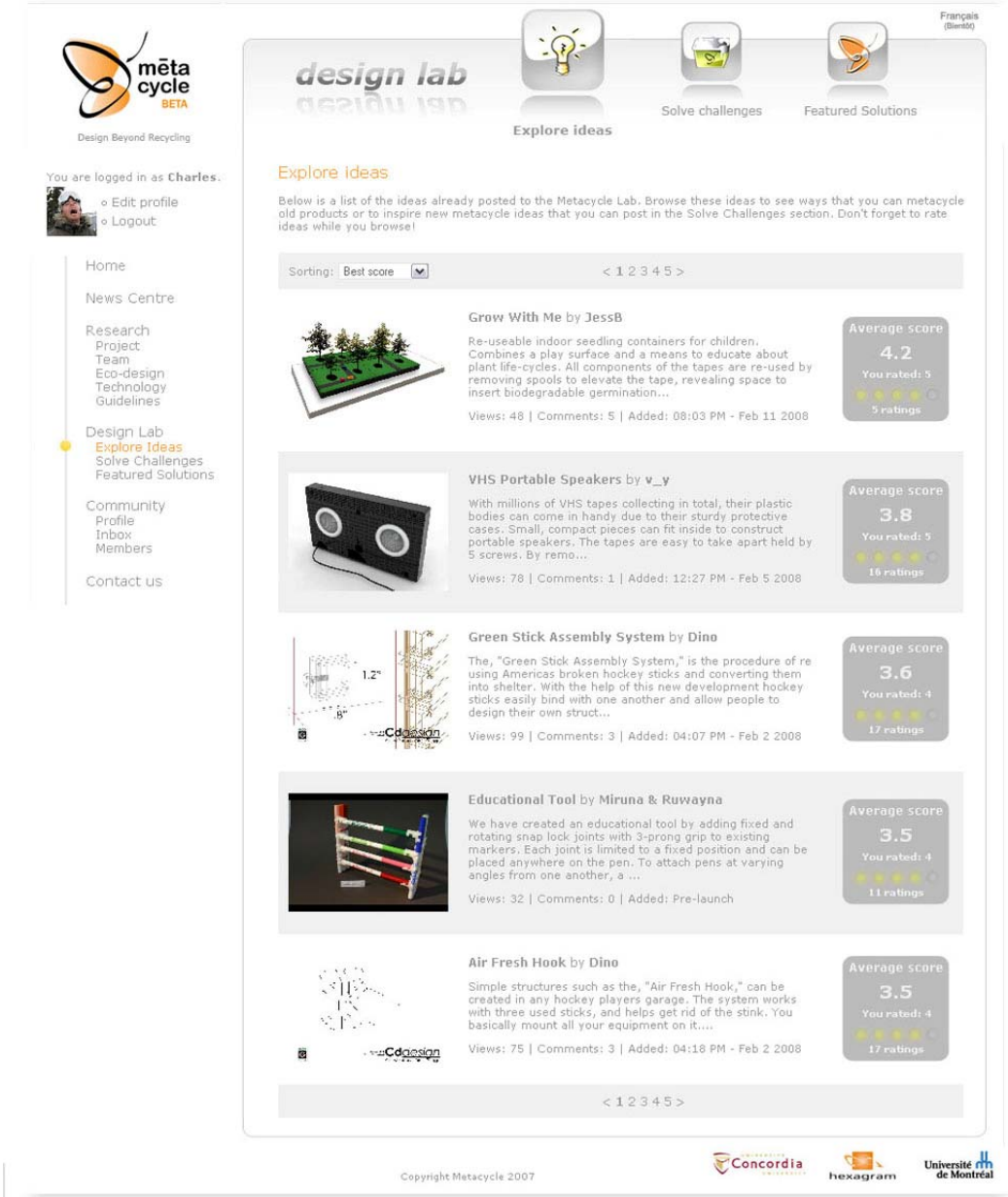

Figure 2: Over thirty examples of Metacycling proposals are available to inspire designers in the “Explore Ideas” section of the website.

Figure 3: A design proposal to transform an obsolete computer mouse into a pencil sharpener using a minimal number of new parts produced by RP technology. By Houle and Zenina

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Criticality Meets Sustainability

Constructing critical practices in design research for sustainability

Ramia Mazé[1]

Abstract

Sustainability requires a wider awareness of the changing conditions for design today – rather than focused solely on preserving nature or conserving energy, per se, this opens up for challenging assumptions about relations between design and society and for constructing new forms of critical practice. Tracing tendencies in conceptual and (post)critical design, this paper argues for further developing the critical discourse within design today and design research as an important arena for extending the ideological and artifactual production of such discourse to users and stakeholders. In relation to my own experiences within the Static! and Switch! design research programs, these perspective are anchored in conceptual, operational, and practical examples of critical practices applied in the area of energy awareness.

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1. Introduction

While often at the forefront of expanding material consumption, designers are now increasingly facing the issue of how to achieve the opposite. The disciplines of industrial and interaction design, for example, grew up around interest in increasing the profitability of the emerging electric and electronics sectors – but, today, the challenge is to change reverse behavioral patterns of energy (over)consumption. Particularly as other parts of the world are rapidly growing in design competence and consumer power, is time to rethink how the powerful and persuasive forms of design might be redirected to critical practices of design and research in the area of sustainability (Buchanan 1989 ; Redström 2006). Just as product and interaction design have helped introduce the design products that we depend upon today, researchers and practitioners in such disciplines must participate in a raising awareness about the consequences of design production and consumption.

Design has long been about the expansion of material welfare. On behalf of clients, design is bound into larger projects of continually increasing economic and symbolic capital. Design is no longer, if it has ever been, solely about satisfying basic human needs of an individual or society, but also about creating needs and even manufacturing desire. However, the reality of limits to the environment – limits to the availability and resiliency of physical resources – also suggests limits to an economy based on the exploitation of such resources (Manzini 1995). Sustainability, and related arguments for an ethical, humanitarian, and critical role for design in society, presents certain challenges to the idea of design only ever ‘in service’ to expanding production and consumption at the cost of the environment (Mazé 2007). Such challenges suggest the need for an increased intellectual and ideological reflexivity within design, as a basis for changing ways of thinking and acting within the discipline as well in relation to clients and consumers.

There are a range of existing and emerging responses to the challenges of sustainability in design. With respect to the problematics of material exploitation, for example, there are calls to shift design thinking away from the production of the ‘new’ towards the revaluation of existing material goods, for a closed and continuing loop of material production, recovery, and remanufacture, and for moving from a materials economy altogether. As some turn towards immaterial design, others return to materiality in terms of the longevity, durability, and sustainment of things through use, interaction, and engagement. Others argue that sustainability is not only a question of material resources but of psychological endurance and sociological durability, through which products are sustained within social practices of consumption. (Chapman 2005 ; McDonough 2002 ; Shove 2003 ; Verbeek and Kockelkoren 1998)

This expanding range of perspectives challenge established notions of what design should be about, and also imply increased interactions with other domains of knowledge and systems of production. In order to understand and craft things with increased and lasting meaning, it seems that designers might need to relate to ideas perhaps more proper to psychology, sociology, anthropology, and material culture. Since designers must not only take into consideration immediate design process and discrete design objects, but effects and consequences that might arise long after, they might engage more extensively ideas about ‘futurology’, ‘futures’, and ‘foresight’ more familiar in the domains of business, economics, and politics. Extending far beyond the established knowledge tradition within design, this requires that

design relate critically and productively to theories and practices in other disciplines without sacrificing disciplinary integrity.

Constructing critical practices in design research for sustainability

This paper traces one approach to design research for sustainability, drawing on a history of conceptual and critical tendencies in design that employ design materials and form for purposes of 'problem-finding' in disciplinary discourse and wider society. Arguing against design 'in service' to ideas imposed from outside and above, critical architecture and anti-design have been arguing since the 1970s for an ethics and ideology proper to design – "Otherwise we will end up by designing beautiful electric chairs or mountains of rubbish," as Superstudio proclaimed (Lang and Menking 2003, 120). Through such retrospection, we might draw out strategies for designing for 'poetic'- or 'critical distance' between design products and those who encounter or consume them, a distance that might enable reflection or debate on sustainable issues. Indeed, this has influenced how we have related to material expressions and interactions in a design research program that is described further in this paper.

Further, critical practices also expose certain possibilities and problematics for design research. Such critical practices have been reconfiguring the relation between theory and practice, both for purposes of building an intellectual and ideological foundation within and proper to design and also for relating to critical and social theory from other disciplines. Further, contemporary conceptual and (post-)critical practices argue not for criticism or evaluation of past or existing things but for the proactive production of new and alternative ideas, an ideological and artifactual production concerned with materializing a 'criticism from within' one's own discipline. Alongside theories that have become some of the critical terms within design discourse, the growing discourse around sustainability constitutes another and essential set of relations that we must find rigorous and generative ways to incorporate into our thinking and making. Given the problematics of (inter)disciplinarity, this requires new and means of constructing and conducting critical practices in design research.

In recent years, I have been part of a collaborative effort to develop design research programs related to sustainability at the Interactive Institute in Sweden (www.tii.se). Since 2004, we have grown a relationship with the Swedish Energy Agency (Energimyndigheten) to inquire into how design and technology might effect energy awareness and behaviors. This has been the focus of two research programs, Static! and Switch! that are presented in this paper. While discussions of Static! as a whole, and the individual prototypes created within, have been presented elsewhere (among others, Backlund et al 2006), this paper draws out some of our thinking behind the program in terms of 'critical practice' and discusses relations to paradigms of practice-based research in the applied arts (see also: Mazé 2007 ; Mazé and Redström 2007). Further, this paper draws out issues from Static! and its relation to critical practice and extends these to describe our approach to our current program called Switch!

2. Critical practices

Design is located in an ambivalent place, wavering between the concerns of culture and capital, which may be more decisively dealt with in other fields. In architecture, for example, criticality has a vivid tradition since a dramatic rethinking in the 1970s of criticism and critical theory within the discipline and within the profession. While contemporary architecture seeks to escape the rigorous and restrictive criticality of the past, product and interaction design are only beginning to feel out intellectual and ideological underpinnings. As John Thackara notes, “Because product design is thoroughly integrated in capitalist production, it is bereft of an independent critical tradition on which to base an alternative” (Thackara 1998, 20). This lack would seem to pose a challenge for designers looking for alternative tactics and values than those present in mainstream production and consumption – indeed, such alternatives might seem essential to sustainable design today.

(Post-)Critical architecture

In architecture, critical discourse has been an arena for developing relations to theory – or, more precisely, ‘Critical Theory’, posed by the Frankfurt School, and ‘critical theories’, as more generally refers to subsequent poststructural, feminist, and postcolonial theories. Based on structuralist thinking, the debate in the 70s ended an ‘era of manifestos’ (generally characterized by a few polemic positions and loose relations between theoretical rhetoric and practical reality). The debate was an attempt to separate ‘operative criticism’ or ‘instrumental theories’, located within inevitably biased positions within professional practice, from theories originating from and operating without, for example in historical or philosophical projects. An outcome of this debate was the emergence of what has been called ‘critical architecture’, concerned with excavating a ream of autonomous knowledge proper to the discipline of architecture. (For background to this discussion see: Allen 2000 ; Hays 1999 ; Hays 2002 ; Rendell, Hill and Fraser 2007)

Examples of critical architecture, such as deconstuctivist works, operate through strategies such as the systematic reversal or transgression of the visual and spatial expectations of form, experienced as an disorientation of cognitive and perceptual faculties. More recent approaches resist negating or inverting norms, constructing a more subtle interplay of historical, social and spatial factors to expose and alter the construction of different sites and situations in terms of power, gender, or class. Inherent in strategies associated both with the ‘critical’ and ‘post-critical’ is the use of built form to evoke a conceptual attitude or experience. Where deconstructivism tended to posit the building as a text, which might then be ‘read’ in terms of norms and their rupture, other strategies might be understood as a sort of ‘embodied conceptual art’, in which bodily performance takes precedence.

Theory has a role in establishing a ‘critical distance’, whether this is distance from mainstream practice or from other related practices, and defining an attitude or position in relation to the conditions within the discipline and those circumscribing it from without. In this sense, criticality, as deployed in architecture, has a purpose and a context, expressing a point of view as a response to existing conditions. Further, as Michael K. Hays articulates, “Critical theory… provides a chance to reflect upon what there is, but also to imagine something different – to question and transform rather than describe and affirm” (Hays 2002, 148) The term ‘critical’ can be posited as “the constant imagination, search for, and construction of alternatives” (Hays 2002, 326), the variety of (post-)critical practices within architecture open up a space for architectural

practice as an arena for conceptually and physically ‘constructing doubt’ within the observer or inhabitant as well as making ‘forceful propositions’ about alternative or future realities.

Conceptual and critical design

In other fields of design, such as the relatively new fields of industrial, product, and interaction design, the basis for criticality is less definitive. At the same time as post-critical architects are reengaging with the material, procedural, and political conditions that circumscribe the profession, product and interaction design are attempting to establish critical terms and construct theoretical bases. As market logics and popular culture have long determined almost all of what happens within product design, designers are seeking and creating alternatives. There are a range of perspectives in contemporary design – amended as ‘conceptual’ or ‘critical’ – that draw on a heritage in radical crafts, anti-design, and critical architecture to diversify or counter mainstream design. (For background to this discussion see: Blauvelt 2003 ; Dunne and Raby 2001 ; Kristoffersson 2003 ; Robach 2005)

Conceptual design draws on the strategies of conceptual art, shifting focus from the maker and the object to the concept behind. Aaron Betsky characterizes the task of conceptual designers such as Droog as "as gathering objects on the streets and reusing them, with the designer adding only something invisible: the concept" (Betsky 2001, 51). High and low materials, precious substances, readymades, technology and trash, may be combined to expose issues of ‘taste’ and ‘good’ design – even material scarcity may speak to ethics and (over-)consumption. Dunne & Raby posit the designer as a sort of ‘applied conceptual artist’, drawing on critical theory and modernist aesthetics to challenge assumptions of ‘utility’ and ‘usability’ in industrial and interaction design. While relating directly to everyday life and utility, conventional terms are revealed to be essentially contested, along with related traditions of judgment in art and design (history) discourse or of technical rationality and scientific positivism. Rather than ‘in service’ to culture or capital, design form and craft are viewed as vehicles for ‘problem-finding’ – rather than ‘problem-solving’ – within disciplinary and societal discourse.

Even as these tendencies engaged with social and political theory, the activity and materiality of designing are nonetheless seen as the basis for ‘active critical participation’ (to borrow a term from anti-design) in larger ideological systems. From modernist aesthetic theory, for example, strategies of decontextualisation, defamiliarization, and estrangement are applied to discourage unthinking assimilation and promote skepticism by increasing the poetic distance between people and products. Such techniques are not merely applied for purposes of analysis or commentary, but for crafting constructive counterproposals and projective critiques. Made concrete in experiential and material form, socio-aesthetic theories from (post-)modern discourse are embodied to interject a critical distance or resistance to easy assimilation between ideas and things. Design form opens up such critique for wider speculation and debate – beyond ‘problem-finding’, conceptual and critical design might be said to ask questions and open these up to designers, clients, critics, and users.

Research through (critical) practice

In the terms of research most established in relation to design, those of history and theory, developing an ‘intellectual stance’ within a discipline requires the development of a relation to critical and social theories on the terms of historiography and philosophy. These were certainly the terms that have preoccupied such a discussion within architecture. However, even within this

discussion, alternative conceptions were being proposed and acted upon. Proposing a notion of ‘criticism from within’, for example, Jorge Silvetti argued on behalf of establishing a relation to theory and ideology through the languages proper to architectural practice – that is, the activities, mechanisms, logics, and forms of making (Silvetti 1977). Rather than the study or criticism of architecture, this posits a notion of criticism as architectural practice and in the form of architecture.

Along the lines of Christopher Frayling’s distinction (based on Herbert Read) between research *into*, *through*, and *for* design, a possibility is opened for knowledge structures and production by means of design processes and products (Frayling 1993/4). Indeed, central to critical practice as discussed here is engagement with the conceptual realm of design. While design craft, techniques and form remain central, these are employed to direct attention to the ideas and ideologies behind and beyond the object in and of itself. In Dunne's case, “the electronic objects produced in the studio section of his doctorate are still 'design,' but in the sense of a 'material thesis' in which the object itself becomes a physical critique... research is interpreted as 'conceptual modeling' involving a critique of existing approaches to production/consumption communicated through highly considered artifacts” (Seago and Dunne, 1999, 16-17). Indeed, the artifact produced within critical architecture and design might be considered as a materialized form of discourse.

Explicitly dealing with the materialization of concepts, theory is engaged not only in external or retrospective descriptions, but as an integral part of the design objects as such. While criticism of design can only happen after and about an object that has already been designed and materialized, this opens up for another form of criticality. As Jane Rendell articulates, “Projects that put forward questions as the central tenent of the research, instead of, or as well as solving or resolving problems, tend to produce objects that critically rethink the parameters of the problem itself” (Rendell 2004, 146). Resulting objects may not solve or resolve problems that might the focus in professional practice, but operate to open up and expose problematics. While it may not be up to design to solve or resolve the complex problematics of the ‘prevailing order’ that circumscribes the discipline and the profession, design may expose and articulate these in ways that make them more accessible to understanding – and to change.

Constructing critical practice

Past conceptions of criticality (such as those debated in architecture in the 1970s) relied on distinctions between different disciplines and disciplinary concerns. For example, borders might be defended or challenged in terms of discrete ‘systems of production’ – that is to say, the concerns, techniques, and knowledge proper to one discipline that might distinguish it from others. Separations between history, theory, and practice were made in order to distinguish respective theoretical frameworks and knowledge interests proper to each. Further, each discipline could be seen as a system of production in and of itself, defined by a distinct and autonomous set of normative features, upon which a critical relation or knowledge exchange between disciplines might be based. Indeed, (de-)constructing such distinctions may be important to a disciplinary project – just as architecture is currently seeking to ease the borders separating theory from practice, newer fields are seeking to establish knowledge foundations and disciplinary boundaries.

However, the contemporary situation of design research and sustainable design are more aptly characterized in terms of multi-, inter-, and trans-disciplinarity. Further, in (post-)critical practice, the interpenetration of theory and practice in the processes and products of design renders such distinctions difficult and perhaps counterproductive. This implies a need for other

approaches to constructing critical practices of design and research. One such approach has been developed by Thomas Binder, Johan Redström, and colleagues (Binder and Redström 2006) that characterizes examples of design research that will be described in the next section.

– Research program. As an alternative to disciplinary distinctions, the research program acts to frame a 'provisional knowledge regime'. The program refers to a set of theoretical and experimental strategies and relations between, a set that is relative rather than absolute but that nonetheless functions to frame a common ground for constructive and collaborative work.

– Experimental design. Driving the program are a series of practical experiments that inquire into and exemplify various concepts and questions set out in a research program. The purpose of experimental design is not to operate as a proof or test of the program, but to learn about, reflect upon, and challenge certain conceptions. The relation between an experiment and the program, and between experiments within a program, provides significant basis for knowledge production on a (transdisciplinary) basis.

3. Criticality meets sustainability

On the surface, sustainable and critical design might seem to be at odds. Indeed, the concerns of 1960s ecological, organic, and pacifist movements were not necessarily congruent with those of contemporaneous radical and anti-design (Burkhardt 1988). Where green and sustainable design may earnestly try to solve pressing, large-scale problems, conceptual and critical design embrace irony, complexity, and ambiguity in order to ask and pose, rather than solve or resolve, questions. However, sustainable and critical design intersect in contesting – rather than affirming or acquiescing to – mainstream or traditional notions of production and consumption. Starting from this shared concern, the intersection of criticality and sustainability might contribute to the ideological foundations in design, as discussed in the previous section, and expand strategies from critical practice to design research for sustainability

Located at a critical distance from mainstream design, and from typical approaches to sustainability, a space is opened up in between, wherein a spectrum of new possibilities might be investigated. It is precisely these possibilities that we have been probing into at the Interactive Institute. For some time, we have been interested in conceptual and critical design strategies to materiality and aesthetics, as well as how the spatial and temporal aspects of designed and interactive forms relate to more existential issues, such as the emotional, ethical, and social values embedded in technical systems. Further, we are interested in how to relate to use as an ongoing achievement, a form of 'active critical participation' (to borrow a phrase from anti-design) involving agency in continually reinterpreting and reflecting on things. Thus we are interested in moving critical practice beyond 'problem-finding' for its own sake but in how questions might be opened up and passed along for reflection – as well as debate and choice – among users and stakeholders.

This means that design cannot only enquire into the conditions for design – those that circumscribe practice and comprise form – but must consider how critical practice and alternative aesthetics condition use. Further, design may materialize 'forceful propositions' about concerns located outside of design – such as sustainability. These are some of the starting points for Static!

Example: Static! design research program

Conducted between 2004-5, Static! was the first research initiative to develop out of a growing relationship between the Interactive Institute and the Swedish Energy Agency. The agency has many research programs directed toward systems, infrastructure, and industry but few focused on private consumers. Participants came from electrical and mechanical engineering, human-computer interaction and interaction design, product and textile design, philosophy and the social sciences, and the conceptual design group Front was a partner in the program. As a first engagement with the Energy Agency, we aimed to create some depth in our research program as well as a breadth of examples of what design research might be in this area. While this means that our prototypes and studies were, thus, correspondingly diverse, the focus here is on those developed in terms of conceptual and critical design.

Research program

The research program in Static! built upon a set of existing and ongoing theoretical concerns in our work at the Interactive Institute. For some years, we have been examining the presence of information and communications technology in everyday life, influenced by phenomenological and aesthetic theories, as well as participatory and critical design. Themes such as ‘slow technology’ (Hallnäs and Redström 2006), ‘technology as material’ (Redström 2005 ; Redström, Redström, and Mazé 2005), and ‘public play spaces’ (Mazé 2007) have countered presumptions of ubiquity and usability, seamlessness and efficiency, within mainstream design and Human-Computer Interaction. Developing alternative forms and interactions, our work has been concerned with putting designers, users and stakeholders in touch with the aesthetics and complexity of new technologies.

Within Static! these interests were further developed in terms of two main ideas: the idea that, as designers, we can work with energy not only from a technical but also from an aesthetic point of view, thereby integrating in a more powerful way the often separate areas of design and engineering; and the idea that product use need not only be about utility and ease-of-use, but also about critical reflection on energy through the objects at hand (Backlund et al. 2006). Countering the tendency in (especially modernist and formalist) design to conceal technical and service systems such as electricity, we shifted from thinking about energy merely as something to optimize or hide away, but as an expressive and valuable material within the spatial and temporal form of everyday design things and micropractices of use.

Experimental design

In the form of prototypes, we created a series of experimental designs to test and craft alternative approaches to our two main ideas. Drawn out of responses gathered from initial probes and interviews into local families and households, we took a starting point in a set of domestic products, such as curtains, radios, lamps, cables, and radiators. To expose the energy within and surrounding these in the home, the form and materials of these products were decomposed – literally and conceptually. For example, Front ‘de-engineered’ material surfaces, such that light or heat would interact chemically to alter decorative patterns (Figure 1a); the workings of an ordinary radio were hacked so that its sound would become overly-sensitive to electrical over-consumption within a local system (Figure 1b); daily interactions with a curtain woven with solar panels and fiberoptics turn it into a self-sustaining light source (Figure 1c).

These objects materialize the patterns and cycles of natural and electrical energy, as well as of habits in the short and long term.

Designing, or redesigning, familiar products to expose the (inter)dependency between energy and our products and actions, these are meant to redirect the focus of attention in mundane interactions. In relation to conceptual and critical design strategies, these examples experiment with the aesthetics of anti/utility or (un)ease-in-use. The disruption of form and/or function relates to theoretical conceptions such as how design might change the focus and availability of things to our actions and choices (Redström 2001 ; Verbeek 1998). In addition to immediate expectations, these examples also explore temporal strategies, such as transformability and open-endedness, repetition and decay (Bell 2003). Thus, we explore variations on how to design things that create a 'critical distance' or 'resistance to assimilation', to borrow phrases from critical practice, ranging from overt to subtle alterations of sensory perception and courses of action.

Further, we designed experiments in which prototypes were deployed into various situations in order to investigate the reception of such alternative 'aesthetics of energy'. Indeed, we took 'reflection in use' was taken literally – as reflection by users on and through their own consumption, interaction, and choices – as well as rhetorically – as the situation of ideas for 'consumption' within wider public, institutional, and cultural contexts. On one hand, the radio and curtain were deployed into long-term multi-household domestication studies, to inquire into immediate and longer term questions of change in relation to household dynamics over time. On the other hand, the wallpaper was created to decay over the course of an exhibition within a contemporary art and design exhibit, opening up for another sort of discussion about form and taste. These and other of the prototypes were also presented in conferences, publications, media, and exhibitions targeted towards the energy and technology sectors as well as the general public.

Figure 1: From left to right, (a) Disappearing-Pattern Wallpaper, (b) Energy Curtain, (c) Erratic Radio

4. Discussion

To the extent that we have been interested in critical practice as a basis for 'problem-finding' within design discourse, we have also been interested in critical practice as 'design for debate'. Much of critical design, however, has been confined to galleries and books, rarely moving outside the ideological modes of production in art and the media. As George Baird notes, "the museum has continued to be a more receptive venue for critical work than the street" (Baird 2005, 5). Instead, we have turned back to everyday things and mundane interactions, considering the intervention of subtle changes in appearance or changes over time. Through materials and form, ideas and ideologies become available both for aesthetic reception and for everyday consumption.

For us, it was precisely utility – proximate interactions and everyday experience – that provided a site for enquiry where the conceptual and practical concerns of design practice and research might intersect. Alternative 'aesthetics of energy' have been about expanding the diversity and precision of techniques for inviting a poetic distance between 'critical objects' and equally 'critical subjects', such that energy issues might become more present in everyday life. Indeed, the tension between 'aesthetics' and 'reflection' exposes a range of overlapping concerns binding practices of production with those of consumption by means of the forms between. Intended tensions within the research program, such as those between notions of the 'reified object', typically in focus in art criticism and design history, and the 'deified subject', as might characterize some phenomenological and sociological perspectives on design, continue to raise theoretical questions.

In addition to our conceptual concerns with use, Static! moved beyond to observe the transformation of perception and behavior. Still considered as forms of 'ideological production', the prototypes were not intended as end products or final solutions, as typically treated within evaluation studies based on usability. Instead, the domestication study focused on the role of the prototypes in emergent social relations and value dispositions within the household context and family life. In addition to 'proper' use and a significant increase in people's awareness of their energy use, reactions to the curtain also included increased sensitivity to the dark Nordic winter, re-arrangement of artificial lighting in the home, and the use of extra lighting to power the curtain. In their own homemade experiments, some used the radio to make their own tests of electric waste in their homes and, in other families, the ownership of energy pedagogy was reversed as children appropriated the radio. (Figure 2) (Routarinne and Redström 2007)

Figure 2: Pictures from the 'domestication' studies of the Energy Curtain and Erratic Radio

Rather than resolving our theoretical speculations, experimental design in Static! exemplified certain ideas and extended them for consumption outside our own 'knowledge regime'. While we did find affirmations of our original intentions in the domestication study, we also discovered a range of further and unexpected interpretations and behaviors. Indeed, the household study even prompted studied experiments within the households themselves, raising new questions about the relations between 'critical objects' and 'critical subjects' and between research by design and/or by use. For us, it became clear that it was not the object in itself that conveys or portrays a message, which might be more typical in 'design for debate', but the interactions among and around objects within a context and over time that might convey a more local and ongoing form of reflection, even criticality, in use.

In examining the parameters of a particular set of theories, questions, and problematics, critical practice works by means of form and formation, thus inevitably interjecting new readings and interpretations. In Static!, we discovered a range of further critical potentials to emerge in and through the extended use of 'strangely familiar' objects. In this case, it was not a question of users correctly interpreting the message or intention of the object, but of discovering their own relations to energy, as well as to one another, by interacting with the objects. This illustrates that a critical practice may not operate only in retrospect – through intervention, we might also act in a projective and propositional way. This is precisely what differentiates critical practice – in its material and operational forms – from hermeneutic practices of interpretation and analysis (Allen 2005). Static! affirmed certain hypotheses, allowed us to sharpen certain ongoing questions, and – importantly – opened up a range of new avenues for research along with new issues. While we are only starting to investigate such issues, it is these issues frame our approach to a new program called Switch!

Example: Switch! design research program

One success of the Static! has been to sustain – and grow – commitment to design research within the Swedish Energy Agency. In addition to a nuanced and first-hand view of design research, the Energy Agency has also been encouraged by vivid discussions in the public, consumer, and commercial sectors. Adding to their core set of research programs, the agency has launched the area of 'Design, Energy and IT', which has funded further research projects at the Interactive Institute as well as stimulating interest in this area among other research institutes and universities. This has led to the successful applications to the agency for further research programs. The recently initiated Switch! program builds on what we learned from Static! by shifting focus beyond discrete people-product interactions. In Switch!, we take an architectural and urban scale to investigate the intersection of material, social, and technical systems that effect values around energy use within a locality over time. We have tried to capture this interplay of issues within the term 'energy ecologies', which relates to our investigation of 'social ecologies' in the domestication study of Static!

The term 'ecologies' relates not only to theories from sustainable design and environmental science, but we are also exploring relations of design to ecological thinking in relation to perception, psychology, ecosophy and sociology, thus regenerating our 'knowledge regime' based on our finding from Static! Switch! also makes an explicit intention to understand – and design – prototypes as arguments, triggers or teasers, prompting not only self-reflection within situations of use but also reflection on local value systems and wider social norms around energy and energy consumption. This research program started in April and will finish in 2009. Future work will involve the development of experimental design prototypes and designing experiments in which these prototypes are situated in analytic, debate, and idea-generation forums with local communities, designers, and public sector stakeholders.

Concluding remarks

This paper presents an approach to the challenges that sustainability poses to design practice and discourse. Within design history, there are aesthetic and formal strategies in and around questions of responsibility, accountability, and criticality. As discussed, conceptual and critical tendencies in architecture and design open up the possibility for operating at a 'critical distance' from conventional notions of design production and consumption. I might even argue, as Silvetti does, that such critical voices and dissenting examples are necessary for developing a disciplinary discourse. However, within a diverse and critical discourse, there is also a need for building common ground(s), even on a provisional and local basis, such that multiple disciplines and divergent perspectives can develop and exemplify ideas together. Through 'research programs' and 'experimental design', critical practice might move from debating critical terms and designing critical objects to learning from making and using of these within constructive and collaborative practices.

This paper traces a trajectory through a 'history of ideas' in art and design to the experimental design of forms that embody and exemplify different theories. Building such an account exposes that our work has some relation to research *into* design but, also, research *for* design. Furthermore, to the extent that our prototypes embodying various theories for design were not intended as final or closed products, but were further mobilized and staged in experiments in households, exhibitions, and other forums, it might be said that we have been conducting research *through* design, in which artifacts act as vehicles for further inquiry and further projects. This latter approach has been less present in Static!, since the domestication study happened quite late and with an expert in the social sciences engaged expressly for this purpose. As we frame Swich!, however, to further consider the social aspects, we are incorporating expertise from design ethnography and participatory design directly into the program, in which the development of experimental design prototypes and methods for designing experiments with stakeholders becomes integral to the process.

Attempting to describe our work through these prepositions is not to simplify, but to articulate the complexity, of doing design research. Design research is made up of multiple practices – the personal practices and associated communities of practice of social scientists, designers, engineers, philosophers, and so forth. The additional domains of knowledge and systems of production relevant to sustainability further complicate the picture. However, this expansion in the factors that must be considered within contemporary design serves to highlight the need for deepening the intellectual and ideological basis within the field. We need to further develop a basis for relating critically and rigorously to the knowledge and expertise external to but circumscribing design. From such a basis, it also becomes possible to act, react, and interact with a range of continually shifting players within the field. Within and across the foundations of different disciplines, design research might play an important role in constructing the conditions for critical practices that are also reflective and generative, agile and regenerative.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

SUSTAINABLE PRODUCT DESIGN:
From delivering sustainable products to enabling sustainable lifestyles

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Abstract

The delivery of sustainable patterns of consumption and production demands dramatic changes in behaviours of individuals, organisations, communities and society at large. This paper focuses on the development of young designers. Results are presented from a five year research programme whose aim was to explore means by which sustainability might be embedded within design curricula. Understanding gained is informing the specification of future generations of design tools that will allow designers to experiment with alternative future scenarios and models of new products before they are introduced into markets. With respect to project goals, the process has enabled the embedding of sustainable development into the curriculum through the student research informing the whole student base with up to date contextual data.

1. Introduction

"*The major cause of the continued deterioration of the global environment is the unsustainable patterns of consumption and production, particularly in the industrialized countries. Developed countries must take the lead in achieving sustainable consumption.*" —United Nations, Agenda 21

The delivery of sustainable patterns of consumption and production demands dramatic changes in behaviours of individuals, organisations, communities and society at large: far more than merely the design and production of eco-friendly products. As consumers begin to recognise the impact of everyday products, consumer goods suppliers are beginning to respond. For example, the RITE Group (RITE, 2008) is aiming to support companies in delivering

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sustainable and ethical textiles and clothing through their global supply networks. Initiatives like this create a demand for product designers who are able to take both a holistic view of the social systems within which the products they design will exist and a detailed view of both technical and human aspects that are key to delivering these products to market.

The focus of this paper lies in the development of young designers who are able to operate in contemporary contexts. Results are presented from a five year research programme whose aim is to explore means by which sustainability issues might be embedded within design curricula. The design researchers were students who participated in a sustainable design project. Since its inception in 2004, over 200 students have completed the project. A three phase process (McKay and Raffo, 2007) is used where student designers research a problem area, define a future vision and then design products that could be a part of this vision. The process is designed around Frayling's design for research methodology (Frayling, 1993). The starting point for each project is a social dimension, beyond concern for the environment, of something that needs to change to improve sustainability. On this basis students define a vision which sets the context for the development of designs that could be a part of their envisioned future. Students are exposed to a level of context that is, in the authors' experience, unusual in undergraduate design education, and the visual presentations of results are powerful, engaging and enable the sharing of messages with a wide audience. The projects themselves focus on the sustainable design of consumer products which, in the worst cases, have high environmental and social costs through their production, use and disposal.

Through the visualisations associated with this paper, we present results from projects completed between September 2006 and February 2008. Sustainability in five problem areas was researched: mobile communication, out of town shopping, energy in daily life, domestic waste and sustainable toys. The visualisations include results from the team research phase, future scenarios that the student in these teams envisioned and designs students created to be parts of these futures.

2. Structure of the paper

In Section 3 background literature on the incorporation of sustainability into business accounting systems, tools for the evaluation on sustainability and the incorporation of sustainability into university curricula are reviewed. A process that was developed to enable the incorporation of sustainability into project-based learning activities of second year Product Design students is presented in Section 4; examples of results from this process are shown in the visualisations associated with this paper. Finally, in Section 5, learning from using this process is used to propose requirements for emerging design tools.

3. Background

The delivery of sustainable lifestyles demands that the full sustainability impact of a product is recognised: full in terms of both the whole life of the product and the way in which it fits into the systems it will become a part of. The triple bottom line, which provided a means of considering economic, social and environmental factors when considering the costs of products and activities, is increasingly being adopted by businesses as a means by which the sustainability of manufacturing organisations can be quantified. For example, Gibson and O'Donovan (Gibson and O'Donovan, 2007) report an Australian study showing an increase in the amount of sustainability information, largely environmental but also addressing other aspects of the triple bottom line, since the early 1990s. This is done in the context of corporate governance and its linkage with corporate social responsibility. A problem with the use of the triple bottom line lies in the lack of a consistent means by which societal and environmental impact are measured. As a result, whilst it is useful for individual institutions in allowing them to quantify their sustainability, difficulties are typically experienced when it is used to evaluate the sustainability of products and

services that span organisational boundaries and, as a result, triple bottom line accounting systems that are incompatible with each other. Foran et al (Foran et al, 2005) propose a triple bottom line accounting system that addresses this issue and so allows the sustainability of products and services to be assessed across organisations in a supply network. Developments in these areas are enabling the sustainability of products and services up to the point of production and delivery to the customer to be measured.

Ness et al (Ness, 2003) provide a categorisation of sustainability assessment tools that includes tools used at different levels of detail, for example, policy versus product related tools. Lifecycle analysis is a widely promoted tool for evaluating the sustainability of products. An example application of lifecycle analysis is given by Banar and Cokaygil (Banar and Cokaygil:2008) who report a comparison of the environmental impact of life cycle analysis of two fruit juice drink packages: a carton and a glass bottle. Anecdotal evidence, however, indicates that the cost of applying lifecycle analysis is often prohibitive (it is applied to specific products on a case by case basis), some data needed is difficult to acquire and its focus on environmental issues means that it is not well suited to supporting decision making in context of the triple bottom line. Marchand and Walker (Marchand and Walker, 2008), in a discussion of sustainable consumption, discuss the need for product designers' foci to extend from improving the sustainable efficiency of products through finding more sustainable ways of delivering the same results to consumers through to reassessing the needs to which the product is responding. For the longer term, improving sustainability performance requires well founded theoretical frameworks that can be used to inform actions. Sustainability science has been put forward as a new discipline whose focus lies in understanding relationships between social and natural systems (Kates et al, 2001; Swart et al, 2001). Key challenges lie in enabling practitioners, such as policy makers or designers and manufacturers, to deal with complexities of both natural and social systems, and of the interactions between them.

Despite the fact that a theoretical foundation is still at a formative phase in its lifecycle, the need to incorporate sustainability into university curricula is widely recognized and many case studies are reported in the literature. In response to the demand for engineers to be able to deliver sustainable solutions, Jeffrey et al (Jeffrey et al, 2004) identify a need for engineering education to equip engineers with skills that will allow them to consider problems holistically and bring together relevant context specific skills in establishing solutions. They propose a model for engineering practice that includes both engineering and sustainability concerns and illustrate it through a water treatment case study that was used in a Masters level engineering programme. Rowden and Striebig (Rowden and Striebig, 2004) describe the use of a personal computer as a case study for the introduction of environmental and ethical issues into engineering curricula; with respect to the triple bottom line, the focus of this case study is on interplays between social and environmental sustainability. Boks and Diehl (Boks and Diehl, 2006) describe the integration of sustainability into an undergraduate industrial design progamme through a client driven team project and Fisk and Ahearne (Fisk and Ahearne, 2006) describe the use of concept maps as a tool for engineers in a postgraduate programme to address softer aspects of sustainability such as social and political issues. A common theme in all of these papers lies in establishing means by which students can learn to address the complexities of sustainability in their design activities and solutions. In this paper we describe a process that has been developed to allow student designers to address the complexities of sustainability and consider how they might respond through design solutions. The process allows student designers to explore and build well-founded design contexts, create visions of futures which are creative yet relevant and then propose concepts that have the potential to change how these futures are considered.

4. Process

The overall structure of the process aligns with the first three steps described by et al (Sanders et al, 2004) in the methodology part of the Design for Results^{TM} framework: Discovery ("Building shared context"), Diagnosis ("Formulating the situation") and Design ("Creating a

preferred future"). The three stage process was created with a view to allowing student designers to explore and build well-founded design contexts, create visions of futures which are creative yet relevant, and propose concepts that have the potential to change how these futures are considered. In this section each phase of the project is introduced with an emphasis on its aim, learning outcomes and criteria that are used to assess students' work.

4.1 Phase 1

This is the context setting part of the project where students research a real problem, considering it from environmental, economic and social viewpoints. At the beginning of the project students are asked to state a preference for a project area in which to carry out their sustainable design project. The project areas offered in 2007/08 (the most recent delivery of the project) were energy in daily life, mobile communication, sustainable toys, out of town shopping and domestic waste. Teams of approximately five students are created with a view to allowing each student to work in their preferred subject area.

The result of this phase is a team poster that is presented verbally to the whole student group by what ever means the team chooses to best present their findings. Through the poster students should have demonstrated an ability to

- analyse a real-world problem from environmental, economic and social viewpoints;
- carry out basic research to gain an appreciation of the scale of a given problem; and
- identify trends in a given problem area.

This phase of the project is worth 20% of the total project mark and is assessed against the following criteria: clarity of message, visual impact, appropriate balance of graphics and text, and demonstration of an understanding of the issues to be addressed in the problem area. The posters are presented to the whole student group so that each student has an opportunity to learn about the wide range of issues to be addressed. An example of the results of this phase, from the area of sustainable toys. is given in Figure 3.

4.2 Phase 2

During this phase of the project students identify intervention points in the situations they defined in Phase 1. They use the results of their research, and what they have learnt from seeing the presentations of other teams, to build up a clear view of the current situation in their chosen area and, from that, produce a vision of a better future and a brief for a product within that future situation. The result of this phase is a team vision for a future where a rule has been changed and individual design briefs. In the visualisation presented in Figure 5, the future vision was, "In 10 years time, very limited amount of transport will have access to out of town shopping centres. Regulations state that cars will have NO access to these facilities". Through their future vision and individual briefs students should have demonstrated an ability to:

- analyse research results and use the results of this analysis to inform the definition of a vision for an alternative future;
- define a future vision;
- identify design opportunities in a future vision; and
- create a design brief for a new product that could be a part of an envisioned future.

This phase of the project is worth 15% of the total project mark (5% for a team vision and 10% for an individual brief). In assessing the team vision we look at the extent to which the vision answers the following questions.

- Does it provide a picture of a possible and improved future by 'changing the rules'?
- Does it say what the rule change will be?
- Does it have economic/social/environmental breadth even if rule change is only in one area?

- Does it show a thoughtful response to the research?
- Does it create an opportunity to 'do things differently'?

In assessing the briefs we look for evidence of links between the brief, the vision and the research and an aspirational and futuristic technical specification that fits with the team's vision and includes clear goals where at least some of these goals should be quantifiable.

For the majority of students, the definition of the design brief is the most challenging aspect of the project and additional support has been put in place as the project has developed to ensure that all students have a brief that is tractable for them. In supporting the definition of the briefs we aim to ensure that all students have a clear goal and have identified a product they are going to design.

4.3 Phase 3

During this phase of the project students design solutions that respond to the briefs they defined in Phase 2 and integrate these designs with results from the previous two phases. The aim of this phase of the project is for students to design a product that satisfies the brief they created in Phase 2 and demonstrate how it fits with their team's envisioned future.

The result of this phase is two-fold: an individual design portfolio for each student which is presented to assessors in an interview and a poster presenting their team research team vision, individual brief and final design. In compiling this poster students are encouraged to update the results of the previous phases to reflect the formative feedback they have received through the project. Through their design portfolios and students should have demonstrated an ability to:

- generate a variety of design concepts that respond to the brief and address sustainable development issues identified in Phases 1 and 2;
- evaluate the design concepts with respect to a range of quantitative and qualitative criteria;
- select a design concept for further development;
- develop a concept design definition that responds to sustainable development issues;
- justify the final design definition, as a response to the brief and in the context of the envisioned future, and identify areas for further development;
- demonstrate design skills in the form of a presentation [visual and verbal] that presents a convincing story of the concept proposed; and
- integrate research and design concepts and communicate them as powerfully and as lucidly as possible to a less knowledgeable audience.

This phase of the project is worth 55% of the total project mark (20% for the portfolio and 35% for the poster) and students are assessed individually. In assessing the portfolios four broad aspects are assessed: the range and variety of design concepts generated, the quality of the final design definition, the extent to which the final design is demonstrated as responding to the brief and the extent to which the design process has applied learning from other parts of the programme of study. McKay and Raffo (McKay and Raffo, 2007) provide fuller details of the assessment scheme for this part of the project. The poster is assessed using the same criteria as those used for the team poster in Phase 1. Figure 5 shows a portfolio page that was a part of this phase of the project in 2006/07 and Figure 4 shows a poster from 2007/08.

5. Requirements for emerging design tools

The delivery of sustainable lifestyles demands that sustainability be assessed both up to the point of delivery to the consumer and after it has been acquired; the assessment needs multiple foci, including the sustainability of the product itself and the sustainability of the system that

includes other products the consumer uses and the social systems to which they belong. In addition, there may well be benefits from considering other kinds of collections of products, analogous to the benefits accrued by service delivers who, through offering product related services, are able to manage (and learn from) experiences gained in supporting individual products as parts of fleets. For example, companies managing fleets of aeroengines can use learning from the maintenance needs of individual engines to create patterns of performance that can, in turn, be used to inform maintenance strategies for the whole fleet. Similar benefits may be possible at other stages of the lifecycle, such as disposal.

As highlighted in Section 3, it is widely accepted that evaluating the sustainability of design options demands consideration of a wide range of factors including the societal, environmental and economic issues covered by the triple bottom line. Pope et al (Pope et al, 2004) review a range of approaches, including the triple bottom line, to sustainability assessment. With respect to design tools, Suh (Suh, 1990) proposed a design cycle including decision making, synthesis, analysis and the flow of information between the activities. This is illustrated in Figure 1.

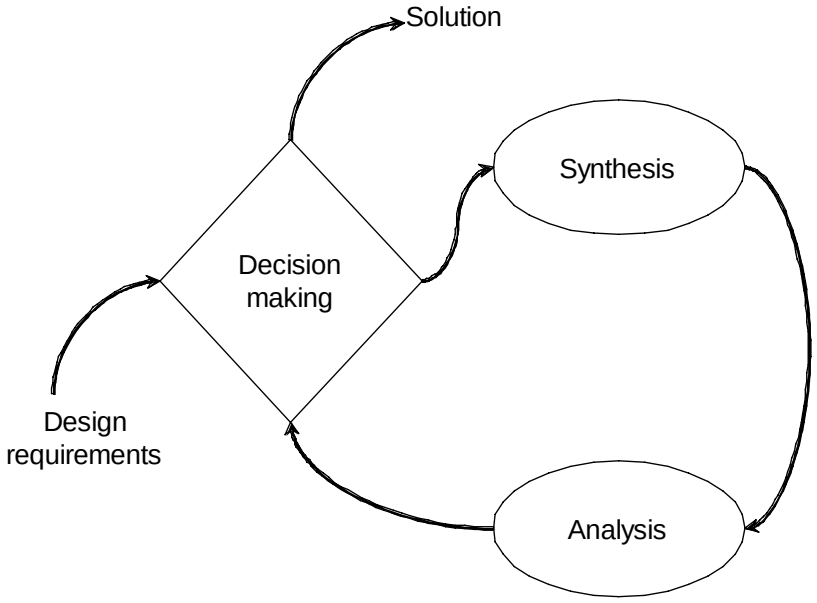

Figure 1: Activities in design cycles (adapted from (Suh, 1990))

Sustainability assessment typically supports design analysis and decision making. Since the systems within which products will live are socio-technical systems the design analyses need to include both hard and soft aspects of the systems and, importantly, interplays between the two. For this reason, appropriate analysis tools are more likely to be simulators rather than traditional engineering analysis systems that are founded on the laws of physics. These simulators might include both computational and human elements so that insights into how products might behave and be used can be gained. From the results of the students' research, a key area for the development lies in support for the information flows. For example, Phase 1 research results are used to envision an alternative future but there is a lack of systematic and feasible ways in which these futures can be articulated, rule changes expressed and then the implications of rule changes observed. This concerns how designers might be able to assess alternative rule changes and the products/product systems that might flow from these rule changes. In essence, design tools are needed that allow alternative scenarios to be modelled in ways that take account of both social and technical factors, and then what-if type questions posed and alternative system behaviours predicted: hence the need for simulation tools. Such tools are important because they will enable designers to identify key points that would be best addressed from the research – something like a sensitivity analysis on the scenarios so that the "right" futures and rule changes are identified before the design brief is formed. In considering future scenarios it is important that designers are not limited in the outlooks they might take and that means are provided where as many players in the future scenarios as possible can be represented (both model- and viewpoint-

wise) since alternative futures are likely to involve different ways of doing things and as such the nature of design solutions may change – not only may a new 'product' have radically different values but that product may be replaced with services or more likely new combinations of product/service – so it is not a better phone [in sustainability terms] but a better way of allowing/supporting communication.

Ness et al (Ness et al, 2007) provide a classification scheme for sustainability assessment tools that includes indicators such as the wellbeing of people in a region, product-related tools such as lifecycle analysis and what they refer to as "integrated assessment tools" which typically use scenarios to inform policy decisions. Ness et al's product-related tools would be well suited to the end of Phase 3 where the product designs are evaluated but there is also a need for analysis tools that will support the evaluation of the products as parts of the envisioned futures students identified at the end of Phase 2. Fisk and Ahearn (Fisk and Ahearn, 2006) describe the use of cognitive mapping with postgraduate engineering students as a means of supporting analyses of complex social and political situations.

In addition to considering people using products, there is also a need to consider the chains of people (in societal groups) and organisations (in markets) involved in a product's life (Foran et al, 2005) and the flows between them (Ness et al, 2007). The emerging discipline of Enterprise Engineering is intended to provide a theoretical basis for the design of enterprises, and so enterprise networks, that are fit for purpose. This demands understanding of interplays between products and the processes and enterprise networks that create and support products through their lives (Thomas et al, 2006). Enterprise Engineering provides a framework that builds upon the view that an enterprise, of which a supply network is just one kind, can be regarded as an organic entity with its own life-cycle. Building upon this premise, there exists an enterprise realization process with three key steps: Define, Develop and Deploy. Three aspects of an enterprise need to be realized during an enterprise realization process: Purpose, Agency and Products and Services. These can be brought together to form the framework presented in Figure 2 and populated with questions to be answered when the goal of the enterprise is to enable sustainable lifestyles. It can be seen that enterprise networks sit in the agency row. However it is developed to serve some purpose (in the Purpose row) and deliver products & services (in the products and processes row). An enterprise operating system is the means by which an enterprise mobilizes its capability to deliver value to stakeholders through solutions. The enterprise operating system is a socio-technical system and the means by which enterprises deliver solutions that meet their stakeholders' strategic intents. What constitutes fitness for purpose depends on the goals of the enterprise concerned. In the context of this paper, the goal of the enterprise is to enable sustainable lifestyles.

An enterprise operating system simulator could provide a way in which alternative product designs could be evaluated in the context of envisioned futures. Representations of designed things (products, services and enterprise networks) could be used to gain insights into how they might behave in parts of their lifecycle after design. The models could be used to provide insights into alternative futures and allow understanding of factors to be considered and trade-offs to be made in developing these futures: building models that will allow us to simulate alternative futures. The simulations are likely to be blends of computational models and human activities, for example, through role plays or improvised performances. From the perspective of how people live and consume, it might, for example, be more sustainable to buy one non-fairly traded non-organic cotton T-shirt and wear it 100 times rather than buy 10 fairly traded organic ones and wearing each one 10 times. It is widely accepted that actually delivering sustainability requires changes in how people behave. So modelling and simulation is likely to take us some way but for society to become more sustainable requires education of consumers. One educational opportunity could be for people to participate in simulations. Taking the simulations out of computers and using computers in different ways could be a means of delivering sustainability. For example, computer-based models could be used to build alternative future scenarios that we could then explore by populating them with real people doing real things. Alternatively, virtual people in virtual environments (such as avatars in second life (http://secondlife.com/whatis/) could be used in simulations.

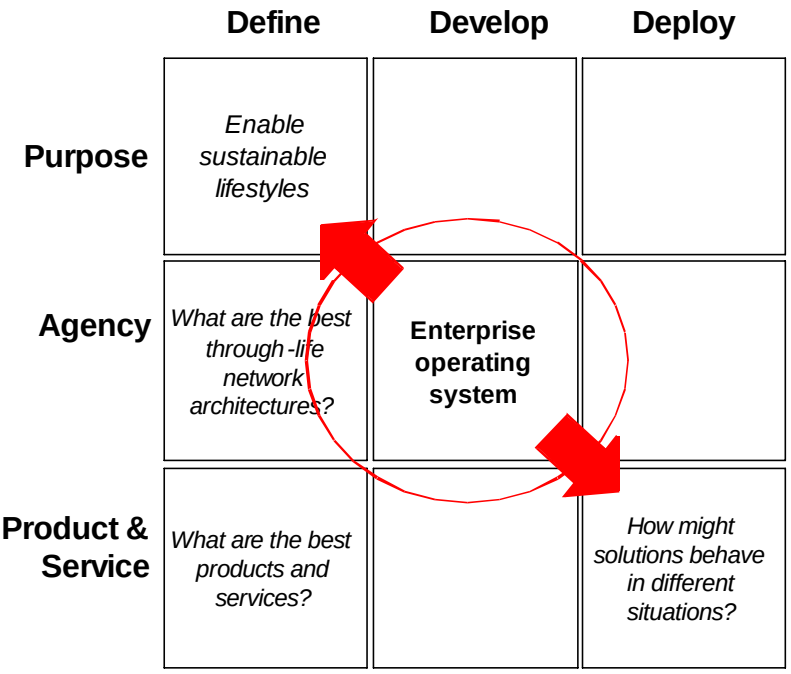

Figure 2: The Leeds enterprise engineering framework applied to sustainability

6. Concluding remarks

The transition from designing sustainable products to designing products that enable sustainable lifestyles requires designers to take both detailed views of the products they design and holistic views of the social systems within which these products will spend their lives. Through the work reported in this paper we have created a process that allows young designers to explore and build well-founded design contexts, create visions of futures which are creative yet relevant, and then propose concepts that have the potential to change how these futures are considered. In a recent publication (RAEng, 2007), the Royal Academy of Engineering identify the need for modelling and simulation as tools for creative design. Understanding developing through this project of how designers might operate at different levels of abstraction is informing the specification of future generations of design simulation tools that will allow designers to experiment with alternative future scenarios and models of new products before they are introduced into markets. We anticpate that these simulations, and the modelling that will underpin them, may form an important part of the future of how design works and in doing so add a new dimension to the design process with design tools supporting designers from the initial creative process through a method of assessing ideas against the research criteria and later, in the evaluation phase of the design process, adding new methods of simulation of different routes to an agreed goal.

Acknowledgements

The work described in this paper resulted from a visiting professors scheme in engineering design for sustainable development, run through the United Kingdom's Royal Academy of Engineering (RAEng). Thanks are due to the 2006/07 and 2007/08 Level 2 Product Design students who participated in the delivery of the project and whose work forms the visualisations.

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Visual materials

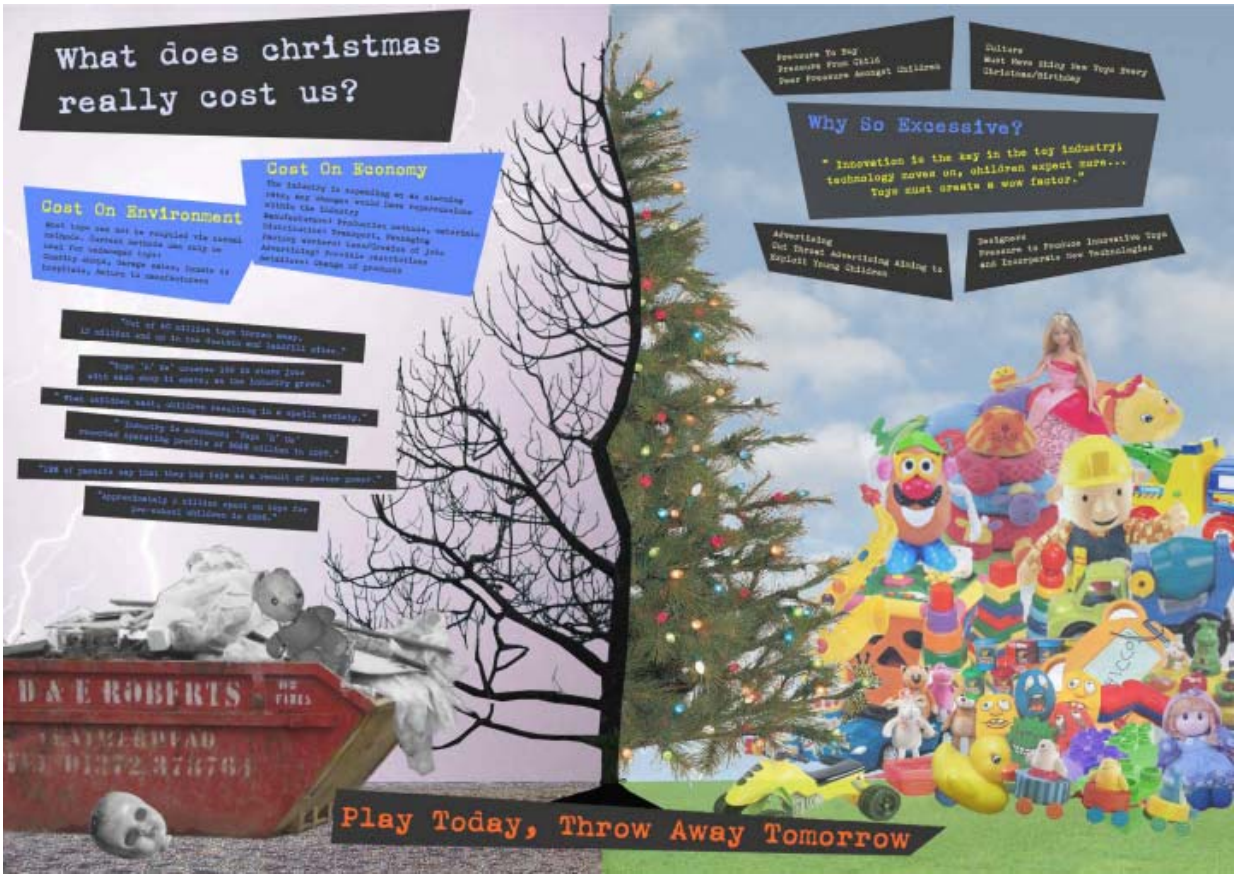

Figure 3: Sustainable toy research: dramatically highlights the focus on plastic toys and their place in consumer society. Questions the need for 'character' over real learning and fun experiences and allows the scene to be set for a different vision.

(Included with permission from Daniel Chisholm, Nicholas Johnson, Elizabeth Sayers, and Katherine Seaton (Product Design, Level 2, 2007/08).)

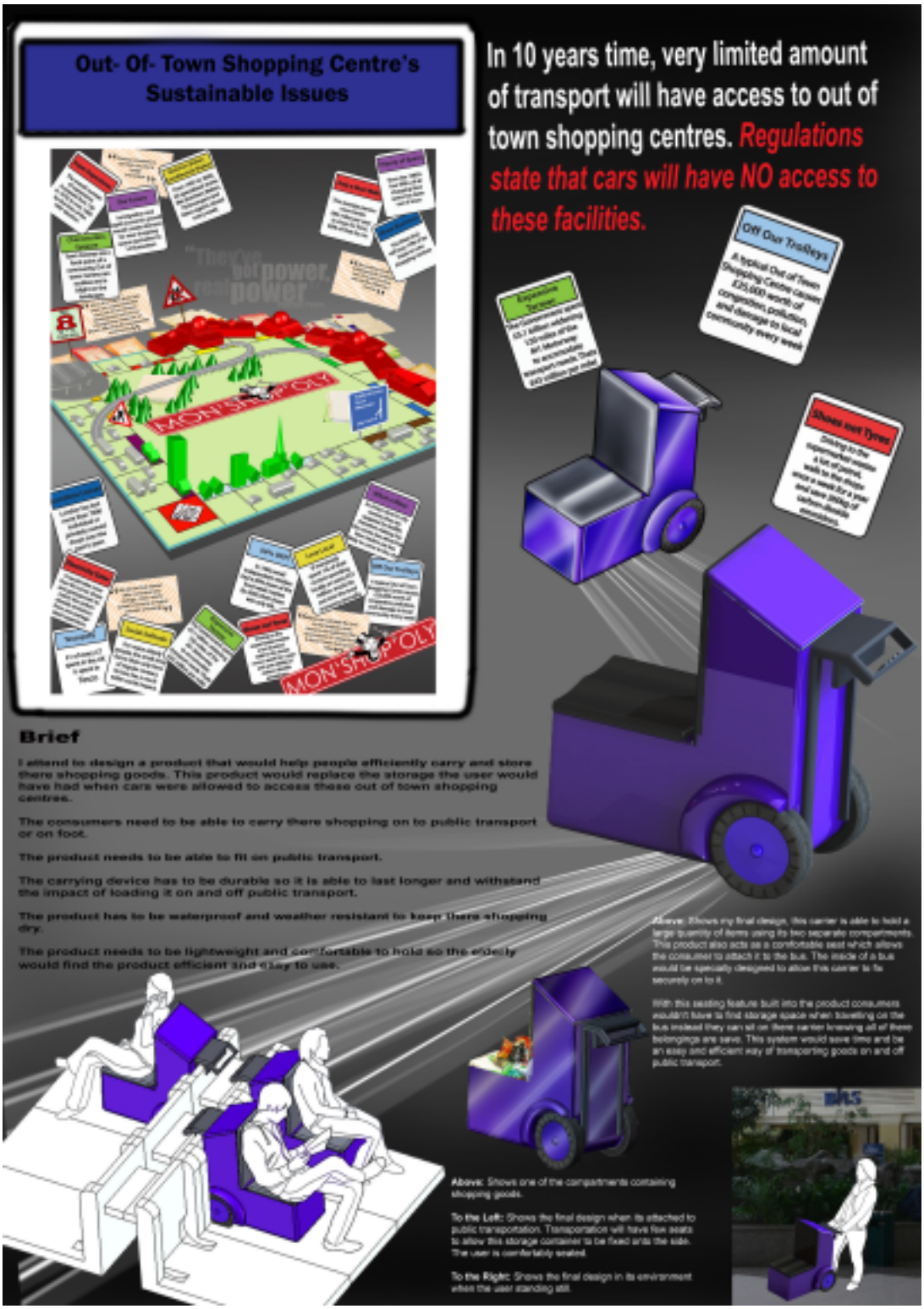

Figure 4: One of the best visualisations and concept of a solution.

(Included with permission from Tiffany Roddis (Product Design, Level 2, 2007/08).)

Figure 5: Part of the presentation of the development of an immersed, virtual shopping world of the future.

(Included with permission from Henry James (Product Design, Level 2, 2006/07).)

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

EXPLORING INDIGENOUS INNOVATIONS:
Ascertaining the Scope for Design Interventions for their Successful Commercialization

Shashank Mehta[1], Ravi Mokashi-Punekar[2]

Abstract

This is the era of innovation-driven economy. Today's fiercely competitive and increasingly saturated global markets, rapid technological breakthroughs, information technology (IT) integration, have all left the old weapons of achieving any differentiation / edge, inadequate. Innovation is today the key to any business success. Coupled with this, the increasing awareness of ecological and sustainability issues, scarcity of materials, stringent IPR norms, mass customization, they all have resulted in the demands for the solutions – innovations, that have emerged / evolved based on local needs and the ones that focus on the 'quality of life' of all of its stake holders. Tomorrow's business will compete on originality, and only the local user and the local context can provide these much needed edge, and thereby the unique strength. Indigenous innovations, it has now been recognized, is crucial for any developing nations to achieve cumulative growth of economic and social developments.

One would in India, come across amazing innovations – solutions that may have been developed / innovated to meet and solve the specific needs and requirements of the person or region. The very nature of the composition of Indian society – primarily an agrarian and service economy, large middle income and rural segment, crafts and SMEs as the main industry sectors, they all encourage development of indigenous and ingenious ways to earn their livings. By their very nature of development, these ideas / innovations will have inbuilt considerations of many of the ecological and sustainability aspects. There is, therefore, a great scope of developing these ideas and also the traditional knowledge into contemporary applications for local solutions. This would benefit the large numbers of people living in the region and would also generate

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employment opportunities. These indigenous innovations / ideas / knowledge could thus form a significant resource that can be developed into marketable products and thereby help creating business successes, and in turn providing a vital direction for the country like India, to transit into an innovation-driven economy.

These solutions, as they will be mostly in the form of appropriate modifications/ refinements or improvements in the existing products, will fall under the category of incremental and ‘bottom-up’ type of innovations, and thus will require further, critical interventions and hand-holding efforts for their transition to markets. Design intervention will here help bring in the much needed empathetic understanding and holistic vision to connect and integrate all the various efforts towards a positive outcome. Designer would, while utilizing the unique strength of the innovation/idea, help connect these indigenous innovations to the users’ aspirations, and in the process help overcome those typical constraints of resources, skills etc. He/She would thus act here as a catalyst to bring in the much needed new changes and new vision.

Synopsis

It has now been recognized that indigenous innovations are crucial for any developing nation in order to achieve cumulative growth, both economically and socially. These innovations, as they will be mostly in the form of appropriate modifications in the existing products, will require further critical interventions and hand-holding efforts for their transition into markets. Design intervention can help bring in the much needed empathetic understanding and holistic vision to connect and integrate the various efforts towards a positive outcome.

One would come across amazing indigenous innovations in India that can be developed into marketable products and thereby help in creating business success. These could provide vital directions for a country like India, to transform into an innovation-driven economy.

Innovation – A Necessity

Tom Peters reminds us in "California Management Review": *'Get Innovative or Get Dead'*. Innovation, has long been recognized, as a major driving force in economic growth and social development. According to the Growth Theory, developed by the Nobel Prize-winning economist Robert Solow, technological progress and innovation is the greatest engine of economic growth. Studies have shown that industrial policies of the world's developed nations give importance to the strategic role of innovations in generating new business ideas which will translate into greater economic growth. For any country aspiring to become a developed nation, it is imperative therefore, to transit to the innovation-driven economy (Goh 2005).

Economic condition of business organizations and the society as a whole, today depends on their capability to produce products and services that are better, cheaper and faster than their competitors. Innovation helps bring in this much needed change and improvements at all levels of business and economy. This helps improve the economic position of all the stake holders involved. Innovation today, is essential for the long-term growth of organizations.

Innovation is also the key to success in all social developments. Creative ideas and innovations challenge existing norms and foster positive growth. They help improve the overall quality of life. Innovative ideas can cross over the hurdles of social apathy, conservative mind sets and orthodox attitudes to usher in positive changes in society. An innovation changes existing rules, norms, thinking and structures to create a novel transformation. Innovations thus, help achieve sustained change in a given environment. Innovation, has thus become the key to the sustainable development of the society.

Characteristics of Innovation

Though the importance of innovation has increased over the years, there exists a clear anxiety and major difficulty in its understanding, both in terms of its definition as well as its process. There is limited knowledge as to why, when and how innovation occurs.(Szmytkowski 2005).

According to the *Oxford Dictionary*, the word 'Innovation' first appeared around 1297. Joseph Schumpete, in his publication "The theory of Economic Development" (1911) had described the motor of the development as the innovation itself (Szmytkowski 2005). Gerard H. Gaynor, in his book *Innovation by Design*, based on the analysis of views and comments expressed by prominent researchers of innovation theories over the years, arrives at a simpler definition—

'Innovation = invention + implementation/commercialization'. While invention is described as the first occurrence of an idea for a new product or process, innovation is the first attempt to carry it out into practice. The emphasis here is on the 'newness' of the idea. Innovation creates new value rather than new knowledge. Innovation is not science or technology. It is about business. Innovations are, generally classified into three broad categories, ie.; incremental innovations, new-to-the-market/society innovations and breakthrough Innovations. Most innovations take place incrementally. Innovation can occur from the bottom-up or be sponsored from the top-down. Each approach will have its strengths and limitations (Gaynor 2000).

Innovation depends on four major elements: resources, infrastructure, culture and process. Innovation cannot take place if any of these four elements are missing. All four are equally important. Innovation encompasses three overlapping dimensions, which are –individual/ you, team/s (that also include you), and the organization/group. The individual/you will be the centre of the entire process of innovation, as only an individual will have new ideas. But taking ideas to market involves team work, for, one person cannot do it on his/her own. One needs to combine several different types of knowledge, capabilities, skills and resources to convert invention/idea into innovation. The leader of the team here, plays a key role to effectively coordinate this process to achieve the goal/tasks. The *personality* of the organization/group, known commonly as *culture*, plays a vital role in innovation. The innovation process generally falls under three major phases that are; *generating ideas, harvesting ideas* and *developing and implementing these ideas*. The common factor in these three phases is teamwork – synergy amongst the group. '*Innovation is about action, it isn't about perfection.'* believes IDEO (Gaynor 2000), (Kelley and Littman 2004), (Adair 2003).

Changing Market Trends

It is observed that, market trends are now shifting from *'globalized'* to *'regionalized'* and further to *'localized'*. The increasing cost of energy and transportation has forced the industries to shift their focus from mass production at one location to batch production at several locations, which solves the problems of logistic support and sale of the product at different places. Scarcity of materials and the ever increasing concern for environment has further pushed industries to localize and customize their products. The fierce market competitions have further forced the industries to localize and customize their products to penetrate each and every segment of the market including the rural segment. The companies are thus forced to shift their focus from mass production to mass customization of their products. *The future therefore belongs to the products that will satisfy the physical and mental needs of the consumer, incorporate the traditional, social, cultural and ecological aspects of the region. They should be produced locally, but in terms of appearance, efficiency and performance they should be world class* (Mehta 2003). The products/solutions therefore will need to be based in the local context so as to be culturally acceptable and economically feasible. This demands local participation and utilization of indigenous knowledge. Stringent IPR norms have further pushed

organizations and nations to emphasize on developing their own in-house / local solutions; namely — indigenous innovations.

Indigenous Innovations – A Way Ahead

Indigenous innovations can aid developing nations embark on a cumulative path of positive growth; thereby helping them join the ranks of the more advanced nations. Local challenges and opportunities that are as varied as the individual communities themselves, provide great opportunities to stimulate economic growth by capitalizing on the local knowledge and resources residing in the communities. '*One style of innovation that really works in a country as large and diverse as ours, is grassroots innovations: this includes inventions for a milieu that is quintessentially Indian. … they are critical to how Indian ingenuity can be directly used to transform our circumstances, in ways that elite corporate research laboratories never can'* wrote Arindam Banerji (Banerji 2004). The need to promote indigenous innovations as evolving alternatives to development has now been well recognized.

In China, the government introduced a fifteen years plan that primarily focuses on its urgent need for expanding its capacity to create "indigenous innovations". The plan, known as "National Medium and Long Term Program for Scientific and Technological Development" was introduced in the year 2006. It identifies innovation as a new national strategy for China to advance into the ranks of innovative countries by 2020. Although the industrial sector in China is burgeoning, much of this it is low value-added, labour intensive manufacturing. Majority of the industries are large multinationals owned by foreign companies, or the state-owned corporations. Realizing the urgent need to stimulate cutting-edge indigenous innovations, so as to reduce the dependence on foreign technology, the plan aims to foster smaller, entrepreneurial companies, because they are the drivers of innovation. The term 'Indigenous Innovations' is translated by them as "independent, self-reliant, and indigenous", one that combines three distinct elements: original, or genuinely new; integrated, or combining existing technologies in new ways; and assimilated, or making improvements to imported technologies (The AeA Competitiveness Series, 2007).

Significance of Indigenous Innovations

Approximately 80% of the world's population, relies on Indigenous Knowledge for either medicine or food (Nakata, 2002). The theme of utilizing indigenous knowledge to create appropriate solutions occurs repeatedly throughout developmental literature. The indigenous communities have always been innovative, but not mainly for commercial reasons (Puffer 1995). These innovations have been in the areas of farming, traditional healing, making of domestic equipments and so on, all of which were and are environmentally friendly (Sopazi and Andrew 2005). Farmers innovate due to necessity, changing conditions and curiosity, doing informal experiments on new ideas either from their own – and/or learned from other farmers, researchers, extensionists and/or other information sources like the mass media (Reij and Water-Bayer 2005). For the last 10,000 years farmers have exchanged ideas, technologies, seeds, and innovations among themselves (Rai and Shrestha 2006).

Indigenous innovations can help find the best solutions for local problems. By utilizing the indigenous knowledge and existing resources available, and in turn also generating new employment opportunities, indigenous innovations help foster self-

confidence and self-respect amongst the community. This eventually leads to economic growth and social change in the community. Indigenous innovations encourage local self-reliance, decentralization of decision-making and fair access to natural resources. As these solutions emerge from the local context, they will be more likely to be accepted by the community. Fostering *'innovation attitude'* amongst the community through appropriate hand holding, encouragements and promotion of indigenous innovations will create positive a attitude towards life and its challenges. This will help safeguard the community morale. This will also capacitate the innovators and the community against external threats that may be in the form of changing socio economic environment, introduction of new products and technologies, or even natural disasters (Puffer 1995), (Rai and Shrestha 2006).

Need for a Global – Local Approach

Combining indigenous knowledge with scientific knowledge can help create solutions that are culturally acceptable, economically feasible and environmentally sustainable for the society being aided (Puffer 1995). The old notion of research & development (R&D), as an isolated process carried out in a laboratory, concerned with generating new technologies and/or applications that are then transferred to the passive users, has now changed. Research and development is now widely seen as a learning process that follows inclusive, participatory, exploratory and experiential approach. Also termed as user-led approach, wherein the user becomes an integral constituent of the R&D team. It is therefore critical to create an enabling environment, for seamless fusion of indigenous and scientific knowledge by utilizing complimentary expertise and experience of people, and the one that is based on mutual respect. This will help stimulate and foster the culture of indigenous innovations in the country.

Indigenous Innovations - Meanings and Associations

It will be worthwhile at this stage to look at the terms “Indigenous”, “Indigenous Knowledge”, “Indigenous Innovation” and “Innovator” and their meanings and associations that are found in various literatures and research papers.

Indigenous

> *Originally, "indigenous" was equivalent to "local" or "folk" or, when applied to knowledge, "informal knowledge". In the 1960s to late 1970s, the word then took on a more overtly populist flavour of "grass-roots politics" and "folk culture" in the sense of "indigenous" as opposed to state or "high" culture. In view of the marginalization and destruction of the ecozones inhabited by ethnic groups, the meaning of the term "indigenous", at least as applied to knowledge, has today come to be used in a context in which "non-western" or "anti-western" knowledge, or the knowledge of minorities, as compared and contrasted with knowledge at the level of the nation state.* (Antweiler 1998).

Indigenous Knowledge

> *Indigenous knowledge is the knowledge that helps a society make decisions about activities, such as agriculture and education that are acceptable to their lifeways. All indigenous knowledge is by definition born out of and therefore primarily relevant to the respective locality. It is not always understood because it is an ingrained part of a culture's lifeways (*Puffer 1995), (Boven and Morohashi 2002).

Indigenous Innovations

*The term indigenous innovation has the same meaning as the following terms: traditional innovation, rural people's innovation, farmers' innovation, local innovation and community innovation, and indeed other related terms. Generally, the term innovation refers to an idea that is new or perceived to be new or altered. If this new idea or improvement of the resources is accomplished through traditional methods or knowledge systems, then it is called an indigenous innovation. It is often the case that, indigenous innovations are environmentally friendly and sustainable when compared with scientific innovations (*Sopazi and Andrew 2005).

*It has been viewed and understood that while local or indigenous technology or practice is recognized as a common practice already adapted and widely used, Innovation is considered more of something new that may have emerged from traditional practices but not necessarily the same(*Rai and Shrestha 2006).

Innovator *(…in the context of indigenous innovations)*

*Someone who develops or tries out new ideas without having been requested by outsiders to do so.' "New" is something that was started in the innovators' lifetime and not inherited from parents, like a farming techniques or a different way of organizing things (*Rai and Shrestha 2006), (Reij and Waters-Bayer 2005).

Characteristics of Indigenous Innovation

Based on the above views it is understood that the term 'indigenous' also has political connotations. Today it has come to be associated with the terms like 'rural', 'grassroots', 'anti-western' and the one based with minority. However, the dictionary meanings of the term are fairly broad based and include 'native', 'original' and 'home-grown' among others, and are lot more appropriate in the context of innovation and its implications on economic and social development.

Indigenous knowledge is ingrained into the culture and exists largely in tacit form. Unlike the western knowledge system (scientific knowledge system) that is easier to communicate and articulate through formal language including grammatical statements, mathematical expressions and specifications, indigenous knowledge is difficult to explain through formal language. Though it is probably the oldest system of knowledge and has evolved with the evolution of mankind, it is not properly documented. It has therefore generally remained constrained within the community/region. By the very nature of its evolution, indigenous knowledge will be different at different locations and with different people (Nakata, 2002).

Indigenous innovations are primarily based on their evolution as well as their applications – in the local context. These solutions/innovations are developed mostly through informal, unorganized and experimental basis, by individuals, group of interested/ affected people from the same community. As the solutions would evolve largely for necessity – to solve the problems at hand, and not for any business purpose, they will have inherent weaknesses, in terms of their replication, production and/or commercialization. They will also have limitations in terms of their migration from one culture or tradition to new environments. Within the specific context/boundary, these solutions will be most effective, both in terms of their suitability as well as sustainability.

For a diverse and densely populated country like India, that is also large in size, indigenous innovations, if encouraged and hand-held properly; offers tremendous business opportunities. For the contemporary Asian economies, the definition of indigenous innovations— “Independent, self-reliant and indigenous”; will be more inclusive and appropriate.

The innovator/s is generally part of the same community facing the problem/ necessity for new solutions. The solution/innovation will largely be the result of personal/interested group initiatives and commitments, in terms of time, resources including finance, and also the risks involved. The solutions will therefore be dependent on the experience, expertise, exposure and enthusiasm of the innovator/s. As both the innovations and the innovators are very much part of the normal life of the community, it becomes difficult to identify/segregate them for their documentation, analysis, planning for further action, or their promotion.

Interventions for Indigenous Innovations - Documentation

Identification, and detailed documentation of these indigenous innovations will be the starting point for any intervention, which may be required/planned. Identification of these innovations demands extensive field survey and investigation. Advertisements through local audio, video and/or newspaper channels, organizing specific competitions, seminars, fairs for local innovators and scouting trips/visits to local areas/villages are some of the methods used to locate these innovations and their innovators. Government and non-government extension/field workers, researchers, students, local functionaries, etc. need to be roped in to scout these ideas.

At the global level, there has been a growing interest in documenting and describing indigenous innovations/indigenous knowledge. According to documentations at the United Nations Development Programme indigenous knowledge fuels multi-billion dollar genetics supply industries (Nakata,2002). Efforts are directed to record and validate this knowledge for its inclusion into scientific knowledge which can then be tried and used for varied applications and contexts. However, safeguards against exploitation and/or extinction, politics between beneficiaries are some of the contentious issues that need to be addressed and resolved. Today, indigenous knowledge is being seen as a commodity, something of value that can be extracted and exchanged, refined, value-added and/or applied to new situations (Nakata, 2002).

Holistic understanding, sensitivity to environment and empathy to local community, while documenting indigenous innovations/knowledge will therefore help protect and augment community interests.

Many national and international organizations and resource centres, actively supported by various global agencies such as World Bank, UNIDO, UNESCO, USAID and many others are now working towards the collection, dissemination, development and extension of indigenous knowledge and innovations. These organizations and resource centres provide a platform for sharing and exchanging knowledge, information and idea/innovation, peer-to-peer learning, and for much needed collaborations and networking with various experts and supporters. They also help raise awareness amongst the community, the role of indigenous knowledge and innovations for the development and growth of local economy. These organizations, while promoting this knowledge about innovations at various levels, help safeguard the interests of the innovators and the community. Besides these, the organizations also provide the much

needed incubation and hand holding support to bring these innovations and knowledge into the mainstream.

The database of Indigenous Knowledge and Innovations is available on the World Bank website - www4.worldbank.org/afri./ikdb and a publication titled 'Best Practices using Indigenous Knowledge', jointly developed by Nuffic - the Netherlands based NGO, and UNESCO's Management of Social Transformations Programme (MOST) are some of the excellent examples of the efforts being currently made at the international level, for documentation and dissemination of Indigenous Knowledge and Indigenous Innovations information (Boven and Morohashi 2002). At the national level, the National Innovation Foundation (NIF), established by Government of India in the year 2000, has documented over 50,000 innovations and traditional knowledge practices from over 400 districts of the country (IEC: IUCN Commission on Education and Communication). This information is shared with the local communities and individuals through the 'Honey Bee Newsletter' that is published in eight different languages and distributed in over 75 countries. The knowledge and information thus transmitted in vernacular languages will help ensure people-to-people communication*. 'A honey bee does two things that we intellectuals often fail to do i) it collects pollen from the flowers, which do not complain, and ii) it connects flower to flower for pollination. In the Honey Bee network, it is a matter of principle that we always credit the knowledge we collect from people and we share any benefit arising from this knowledge with them fairly'* , explains Anil Gupta, executive vice-chairman NIF(Gupta 2000). The NIF also announces innovation awards and competitions at the national level to recognize and reward these innovators.

Interventions for Indigenous Innovations - Hand-holding

While the organizations mentioned above are focusing their efforts towards documentation, dissemination, promotion and protection of indigenous knowledge and indigenous innovations, various other organizations are working in the field to provide hand-holding and incubation support to convert these local innovations into commercially viable solutions/enterprises. One such international organization, PROLINNOVA (Promoting Local Innovation), set up by ETC – Eco-culture, a Netherlands based NGO, is today actively involved in various African, Latin American and Asian countries. Through their unique Participatory Innovation Development (PID) programmes, PROLINNOVA creates institutionalized partnerships of local innovators and scientists/researchers/academia to jointly experiment on innovations (Rai and Shrestha 2006). This helps to bring the local innovator at the centre stage as a leader/coordinator and equal partner of the entire development process. Similarly, the PFI (Promoting Farmer Innovation) project, the ISWC (Indigenous Soil and Water Conservation) project and many such projects implemented in Tanzania, Ethiopia and other African nations, arrange village workshops that facilitate farmer-innovators to organize themselves into cluster, to then carry out joint experiments/refinements/improvements on their innovations/ideas (Reij and Waters-Bayer 2005). This, while reducing isolation of these innovators, stimulate community-led social development processes. The village workshops, while together improving the identified indigenous innovations, will also discuss and identify problems/issues bothering the community that can then be solved jointly. Rural Innovation Network, RIN, Kerala; Rural Incubator, Hyderabad; Grassroots Innovation Augmentation Network, GIAN, Ahmedabad; etc., are few of the Indian organizations, today engaged in similar pursuits of development and hand-holding for indigenous innovations. These organizations help the innovator carry out market research, product refinements, sourcing of resources including capital, and its protection

through IPR applications etc. They provide a platform for collaborations, partnerships for further development, and also if required, the identification of a possible entrepreneur/company to finally pass on the innovation for a royalty.

Interventions for Indigenous Innovations – Case Studies

GIAN, Ahmedabad, successfully supported Amritbhai Agrawat, an artisan-innovator from a small village in Gujarat, to further develop his innovation of a four-wheeled bullock-cart integrated with tilting mechanism. This new innovative cart eliminates the drudgery for the farmers/labourers involved in manually carrying and spreading the farm manure in the field. The tilting cart can be used single-handedly by the farmer to distribute manure over the entire field. GIAN arranged the innovator to refine and improve this new innovation, get the necessary micro-finance etc. and also helped Amritbhai file patent for his innovation, which is now licensed to three entrepreneurs on district basis for its production (Gupta 2000, 20-21). Another success story is that of the 'rain gun', innovated by Anna Saheb, a local innovator in Kerala. Anna Saheb was successfully supported by Rural Innovation Network, RIN, which helped to understand its market potential, its further improvements and finally its technology transfer to another company. (Banerji 2004) Both these case studies are the examples of successful interventions for implementation/commercialization of indigenous innovations so as to benefit both, the innovator - in terms of satisfaction and financial gain - and also to their many users, for getting products/solutions suitable to their needs and contexts.

Criteria for Selection of Indigenous Innovations

Indigenous innovations, as they are not clearly defined, thereby make it difficult for the field/extension workers to differentiate them from the traditional practice or technological advances. These indigenous innovations/solutions could either be in the form of innovative modification/value-addition of the existing/traditional product/ process/ application or entirely new innovation that may have emerged locally or transferred from outside. PROLINNOVA's Nepal unit, based on their experience over the years, has developed criteria that could be used as guidelines for the field workers while selecting these innovations (Rai and Shrestha 2006). The important criteria for these guidelines include its technical feasibility, economic viability, environment friendliness and its social acceptability. The innovation should be locally evolved/developed using local knowledge and skills, by addressing the person's/community's immediate or long term needs. The solution should also be widely replicable while getting the innovator's consent and his/her level of interest are one of the important criteria of selection, suggested in the guidelines, its adaptability (how easily can it be used/ modified), use of easily available/accessible local resources, its affordability and cost effectiveness in terms of time and resources are few of the desirable criteria suggested in the guidelines. These criteria for selection of indigenous innovations help prioritize these innovations as per the context, understand the level of innovation and also the need and type of further interventions required.

Design – a Key Constituent of Interventions

The interventions/supports offered by these organizations would largely be in the domain of marketing – to carry out initial market research to understand market and business potential, and/or for marketing of the new products; planning and management of resources, finance; technology – product refinements, modifications, product testing

and production/replication; capacity building through training and exposure, etc. Besides these, the organizations also support the innovators for documentation and protection of innovations, promotion and dissemination of innovation and knowledge to larger audience, interface with government, academia, industry, etc., and the much needed co-ordination, networking and hand-holding. The hand-holding supports, including documentation, are generally carried out from anthropological perspectives. By the very nature of these interventions, they focus largely on market and business potentials, that is, commercialization of these innovations.

There are however little interventions visible in terms of idea/content refinements/ improvements. Design interventions, here can bring in the much needed user perspective, and help the solution sharply target its primary objective as indigenous innovation, to satisfy the need, the skills and resources available, and the local context. Product refinements, from its functional, production/fabrication, packaging and transportation, maintenance and service and also aesthetics aspects, will help convert these preliminary ideas into marketable and sustainable products. Designer's ability to view the problems from various different perspectives, empathetic understanding and unique focus on quality will help bring in holistic understanding of the problem at hand. Besides this, his/her ability to create and evaluate multiple alternatives, while helping to communicate with varied stake holders - each with different backgrounds and expertise - will help reduce numbers of iterations and thereby precious time and resources. The Grassroots Innovation Design Studio, GRIDS, set up at the National Institute of Design, NID, in collaboration with GIAN, Ahmedabad, helps provide this crucial design intervention support to the local innovators and organizations.

Characteristics of Successful Indigenous Innovations

Successful indigenous innovations, according to Paula Puffer, quickly become permanent local knowledge of the community (Puffer 1995). Paula Puffer, from her study of several such innovations, has derived some of the features that she found were common in these innovations. These features include its affordability, easy availability and reduced risks. According to her, a successful innovation generates income and at the same time saves labour. It should be easy to understand and should easily fit into current practices. These innovations produce readily visible results within a reasonable amount of time. They meet multiple needs of the user/community and are attested by evidence from several sources, including those most trusted in the community. These innovations take into consideration things such as taste preferences, nutritional beliefs, etc.. The innovators, designers and organizations therefore can try to incorporate as many of these features as possible, to improve/refine their indigenous innovations to increase the potential of their acceptability and thereby their success.

The best/successful solutions, according to the UNESCO/MOST publication titled 'Best Practices using Indigenous Knowledge', demonstrate positive and tangible impact on the living conditions, quality of life or environment of the individuals, groups or communities concerned. They are innovative, and offer creative solutions to common local problems. These solutions create sustainable effects, in terms of eradication of poverty, social exclusion, etc., and especially through participatory involvements. They also act as source of inspirations to others and also as a model for generating policy initiatives (Boven and Morohashi 2002).

Indigenous Innovations and India

India, with its rich tradition of over 5000 year old civilization, posseses infinite treasure of indigenous knowledge and practised wisdom that are being constantly used and practised in the daily life. *Creativity, in each of the culturally cohesive Indian societies, was recognized as a quality as essential and ordinary as the act of breathing...,* observed Dr. Kapila Vatsayan, a noted historian, during her convocation address at NID in 1989. Over seventy percent of India's population today, lives in more than 5, 50, 000 villages spread across thirty-five states of the country. Agriculture and crafts being their main sources of income, use of indigenous knowledge and indigenous innovations is here a necessity and therefore a common practice. As for Indian industries, majority of them comprise of Small and Medium scale Enterprises (SMEs). Fierce competition amongst these more than 3.57 million SMEs and auxiliary units drive constant innovations – indigenous innovations - for refinements and up-gradations of their products and processes. Also, a vast majority of the country's population comprises of people from rural and middle-income group segment. Indigenous innovations here are a necessity for them, in their struggle of daily life. *Indians by nature are highly enterprising and they find ingenious and amazing ways to make the most of whatever resources and skills at their disposal to earn their daily living. ....Design is the way of life in India* (Mehta 2003). There is therefore, a rich resource of indigenous innovations available in India that could be meaningfully exploited to stimulate social and economic developments at all levels of the Indian society.

Conclusions

This is the era of innovation-driven economy. Today's fiercely competitive and increasingly saturated global markets, rapid technological breakthroughs, Information Technology (IT) integration, have all left the old weapons of achieving any differentiation/edge, inadequate. Innovation is today the key to any business success. Coupled with this, the increasing awareness of ecological and sustainability issues, scarcity of materials, stringent IPR norms, mass customization, have all resulted in the demand for the solution – innovations, that have emerged/evolved based on local needs and the ones that focus on the '*quality of life',* of all of its stake holders. Tomorrow's business will compete on originality, and only the local user and the local context can provide this much needed edge, and thereby the unique strength. Indigenous innovations, it has now been recognized, is crucial for any developing nations to achieve cumulative growth of economic and social developments.

The very nature of the composition of Indian society – primarily an agrarian and service economy, large middle income and rural segment, crafts and SMEs as the main industry sectors, they all encourage development of indigenous and ingenious ways to earn their livings. Its rich resource of indigenous knowledge evolved over the years, is been constantly used and practised in the efforts of their survival, and also their progress. One would therefore, come across amazing innovations – solutions that may have been developed/innovated to meet and solve the specific needs and requirements of the person or region. By their very nature of development, these ideas/innovations will have inbuilt considerations of many of the ecological and sustainability aspects. There is, therefore, a great scope of developing these ideas and also the traditional knowledge into contemporary applications for local solutions. This would benefit the large number of people living in the region and would also generate employment opportunities. These indigenous innovations/ideas/knowledge could thus form a significant resource that can be developed into marketable products and thereby help creating business successes,

and in turn providing a vital direction for the country like India, to transit into an innovation-driven economy. *Indigenous design and development capabilities are the keys to gaining a competitive edge.…One of the very important ingredients for success of the vision of transforming India into a developed nation by 2020 is the evolution of creative leaders,* said His Excellency, the President of India, Dr. A. P. J. Abdul Kalam, during his 25th Convocation address at NID on 5th January 2005.

Indigenous innovation, by its very definition, is the one that is evolved locally, utilizing local knowledge and locally available materials, skills and resources, to solve typical local problem/s. It has to be culturally and economically acceptable to the community. Ideally, the indigenous innovation, if it is exported or transported out side its locality/region, should render itself ineffective, inappropriate or it may cease to exist completely. The boundary of the locality/ region will be flexible and may include region, states or countries, depending upon the type of solution/s and its applications. These solution/s could be in the form of non-conventional use of a given product, local improvisation/modification with scope of replication, new application of the product/materials, combination of traditional skills and the contemporary needs and markets, a foreign technology/ solution modified/value added to suit the local context, or it may be in the form of a completely new innovation. It is generally carried out to add value, to increase the life-cycle or usage of the available resources and/or products, to reuse or recycle the available products/materials, to create new opportunities and above all to improve the quality of life of the people involved. By their very nature of development, these solutions/ideas would have inbuilt considerations of many of its usability, practicality (in terms of its production/fabrication), ecological, cultural, and sustainability aspects of design.

Majority of these solutions/ideas, as they are developed to solve specific needs of the person or a group/s and not for any commercial purpose, would therefore be found scattered in the community. These solutions, as they will be mostly in the form of appropriate modifications/refinements or improvements in the existing products, will fall under the category of incremental and 'bottom-up' type of innovations. Due to the very nature of these innovations, they all will require further, critical interventions and hand-holding efforts for their protection (in terms of IPR, etc.), promotion and developments. Connecting this informal and indigenous knowledge of the innovator to the formal knowledge of the researchers/academics/industry needs delicate and empathetic hand-holding. Replication and/or commercialization of the solutions demand different expertise and mindset, than the ones generally associated with the innovators.

Any innovation involves risks, and demands patience and perseverance. The government and the NGOs involved in these tasks therefore, need to be willing to share these risks and be prepared for their long term involvements. Also, innovation is primarily a team work that thrives in creative environments and a culture that encourages experimentations and positive critique. Team synergy based on complementary expertise and strength of each of the members, and innovator as its central member, will greatly increase the chances of its success. A cluster based participatory approach that brings together the grass root innovators from the region/locality and the scientists/researchers will therefore be more suitable here.

While, interventions and supports in terms of marketing, management, engineering and finance are visible, the design interventions, that are so crucial today to develop these innovative ideas into marketable solutions are found missing, or are at best

inadequate. With global outlook, sensitivity to local needs and aspirations, and capability to hand-hold the innovator/industry, designer can help convert these innovative ideas into market success. Design, it is now recognized, is the core of innovation, and thus the key to any business success. By the very nature of its profession, design helps bring in the much needed empathetic understanding and holistic vision to connect and integrate all the various efforts towards a positive outcome. Designer would, while utilizing the unique strength of the innovation/idea, help connect these indigenous innovations to the users' aspirations, and in the process help overcome those typical constraints of resources, skills etc. He/She would thus act here as a catalyst to bring in the much needed new changes and new vision.

Indian economy demands different solutions, the solutions that are 'people centric' - people not as consumers but as human beings – a solution that generates new employment opportunities utilizing the existing skills of the people, improves the standard of living while preserving the values of traditional society (Mehta 2003). These necessitate developing a product design methodology that addresses this unique need to en-cash the abundant ingenious and indigenous resources available in the country, encourages sustainability in all its forms, and the one that is focused primarily on improving the quality of life of people involved.

Over 50,000 indigenous innovations and indigenous knowledge practices, documented by NIF, over the last seven years, could form an excellent base to build further interventions efforts. These ideas/innovations could be categorized to understand their levels of innovations, type of further interventions required, their practicality and replicable aspects, their market and business potentials, etc. While providing necessary support for their protection/IPR, developing an idea-bank/ website of these innovations with necessary technical details and market and business potentials of each of these ideas will help connect these innovators/ innovations to the interested investors/entrepreneurs. Systematic, networked and institutionalized interventions involving design, technology, marketing, management and finance specialists, along with the innovator and local participation will help increase the rate of successful transition of these innovations into markets. Incubators that can provide these much needed hand-holding supports to the so far isolated individual/innovator to quickly get varied expert inputs, information and resources are thus the need of the hour. Increased rate of conversion of these indigenous innovations into market success will thus, help foster innovative attitude in the community, leading to economic and social developments at all levels of the society.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

UFOs

Unidentified Future Objects

A suggestion on civilization brought from creative bottom-up instances

Mendoza Andrea[1].

Abstract

"*If an alien from outer space were asked*
why on Earth cities exist,
he or she would no doubt answer that
its inhabitants use those to move around,
mainly to practice the art of shopping"

BAS DE LEEW[2]
UNEP - Head of the integrated resource management unit

Constraints at all levels from time and space to tolerance and creativity affect contemporary cities/citizens.
Within this urban ambit where material and immaterial resources are limited, the aim of this paper is to give account of the promising value that a bunch of subjects and their bizarre objects, (who's value at this point of time, and space is almost invisible) can be taken to other layers of society; subjects who by chance more than by choice, don't go performing the art of shopping on planet Earth.
The paper describes who these dwellers are, focusing on the solving "technologies"/artefacts that these dwellers invent and re-invent on everyday basis and that come from non-conventional tactics backed mainly on their primal creativity.

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[2] de Leew Bas. 2003. Quoted in :Manzini Ezio, Jégou François. Sustainable Every-day Scenarios of Urban Life. 2003. Ed. Ambiente. Milan.

Introduction

Have you ever seen an UFO?

Science fiction movies[3] tell that nowadays, and since long, aliens live infiltrated among our societies and that they have produced many of the episodes having place along centuries in planet Earth, from NY blackout in 1977 to the microwave oven, liposuction or even the discover of fire and the invention of the wheel.

Now, what if we gave those fictional plots a try, and started looking closely, on the streets to the non-conventional subjects and their objects? What if "aliens" are really not about to come, but are already here? And what if, as fiction tells, aliens are not "them" but, we, ourselves? What could we find out when walking out on that whirling dimension called modern urban public space?
Apparently we could find hundreds of strange artefacts with which certain individuals seem to be fulfilling their daily needs all over the world, individuals that with their bizarre inventions seem to be key in the development of our revolving civilization.

In addition, we may find that those emerged objects populating our streets, don't come from far galaxies but are artefacts with which simple people who by social, political, economical or even religious circumstances have had to (as Anthony Giddens suggests[4]) invent and re-invent on daily basis their lives.

These "aliens" who hereafter we will refer to as SOLOS (Self-Organized-Livelihood-Subjects), with heir self-arranged artefacts give account of a self-organization and talks about a self-regulation capacity, which as a value spreads in their surroundings as a kind of mutual regulation among societies.

In order to make a living and a life Solos, those subjects that in struggling situations choose for positive although difficult ways to give solution to their needs by providing a solution/service/answer to others, invent artefacts which for the purpose of this paper are named UFOs: Unidentified-Future-Objects.

Aims

Toolkits, guidelines, methodologies, sets of though criteria, complexity organizers… the aim of this paper is not to give recipes. On the contrary it intends at suggesting different research paths that not necessarily derive in design interventions, this because in order to act, it is first necessary to modestly stop and think.
In these revolving days this could seem as a privilege, and indeed, it is.

The aim of this paper is:

-–To invite those interested in changing urban mainstream conditions to be acquainted of the promising value that a bunch of city dwellers located -and moving- in different parts of the world happen to have as mere valuable capital; a capacity to organize daily lives on self-basis by adopting spontaneous, unedited and at times bizarre mechanisms to fulfil their basic needs.

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[3] e.g. Cocoon, the Abyss, Mars Attack, and or Man in Black in which actors affirm that the steel operas at Queen's World Exhibition, the NY big blackout in 1977, the microwave oven, the liposuction, etc., are just things invented in other galaxies and given by tourist visiting planet Earth in exchange to get entrance permit. Muller Jurgen in Cinema degli Anni 90. Taschen GMBH. Page 478

[4] Giddens, A. (1991), *Modernity and Self-Identity*, Oxford: Polity Press, 1991

This acknowledgment is of utmost importance at this point and state of the world hence Solo's existence has been banalized, whereas they could be blueprint for the emblematic and unsolved match between primal needs and needs that come from consumerist societies.

Taking off

As Christopher Alexander did in his text "the city is not a tree[5]" here we will try to exemplify how Solos and their UFOs activate the dynamics of a city:

It's early in the morning. A large tray covered with a white tablecloth seems to be floating on an Istanbul street. Two wooden legs hang from it; two human legs push, shovel, move randomly under it. Legs belonging to a street vendor who happens to be selling "Simits", a typical Turkish pastry usually eaten for breakfast, pastry that he carries on the tray.
The vendor seems to be driven by a radar, being sensitive to any slight vibration of potential customers.
Even with the tray on top of his head he is able to "see" a woman who behind the veil curtains watches him from the second floor of a building. He detects her, looks up and tries to make eye contact to offer her the Simits.
The woman feels embarrassed and walks away from the window.

In the meantime a man walking down the street has seen the vendor and buys some Simits to take away. A young woman getting out of her apartment drops by the vendor and buys a bag of Simits before riding her car.
Minutes later the street is void again. The food vendor might has reached the Bosporus' port where he might have unfolded the wooden support he was carrying, built up an ephemeral table and stayed there selling the Simits until midday. The passer-by should have eaten the Simits while sitting on the minibus on his way to work and the woman should have eaten them while maybe driving, putting some making up and talking over the cell-phone".

Quotidian, simple, everyday actions. Events that talk about a society but also about a quality, a tradition, a mode and a mood to solve daily needs with not necessarily main stream solutions. The consumers here described could neither do the Simits themselves because it is time taking, nor prepare them because the Simit's recipe is something that was not passed to them from one generation to the other.

The object described here, which is a kind of articulated one formed by the tray, the tablecloth, the wooden support, the Simits and the guy, is actually a subject/object entity.

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[5] Alexander Christopher, the city is not a tree
"In Berkeley at the corner of Hearst and Euclid, there is a drugstore, and outside the drugstore a traffic light. In the entrance to the drugstore there is a newsrack where the day's papers are displayed. When the light is red, people who are waiting to cross the street stand idly by the light; and since they have nothing to do, they look at the papers displayed on the newsrack, which they can see from where they stand. Some of them just read the headlines, others actually buy a paper while they wait.
This effect makes the newsrack and the traffic light interactive; the newsrack, the newspapers on it, the money going from people's pockets to the dime slot, the people who stop at the light and read papers, the traffic light, the electric impulses which make the lights change, and the sidewalk which the people stand on form a system - they all work together".
http://www.patternlanguage.com/leveltwo/archivesframe.htm?/leveltwo/../archives/alexander1.htm

Briefing, these urban "objects" have neither been identified as mirrors for people having their lives ruled by mainstream ways of production/consumption, nor have been detected by the radar of those working on the city subject, who could target them not as informal-immigrants-burdensome vendors, but as possible bottom up creators that could bring about solutions starting from behavioural instances for the here, for the now, and for the future.
These solutions, let us be clear, would not mean to make designers "improve" Solo's ways of being and doing or pushing design to fall into an old discourse of using discarding material to add more objects to the already saturated material culture environ. As said this reflection is been made as part of Design Research Studies and as such invites at thinking on the way that design and associated disciplines, could prompt citizens to spark their inner primal creativity such as Solos already do.

Cities, a resource

Solos field of action stands in what according to Hans Rosling[6], (Swedish expert in human development), is the 60% of the Planet's population. People who are not beggars but trashing about on daily basis to get a living within a radius of income which goes from 10 to 20 dollars a day[7]. Therefore, they don't miserably dwell in the marginal parts of the cities because as said, they have pierced contemporary urban spaces.

Reflections on the future of contemporary cities have been addressed from the most fictional to the utmost realistic scenarios; but it was not until the last decade that it started been seriously taken, meaning passing from just envisioning what a better planet or cities could we build up or what apocalyptic almost cinematographic catastrophes should we avoid, and started acting. Dozens of roundtables[8] gathering brilliant characters from all over the world have met in all conceivable places to start making sure that policies were put into practice.
Many of these actions have been prompted by top down organisms, official leaders and/or by disciplines strictly bonded to the city such as Architecture and Urban Planning; but now it seems that the subject "city" needs that fiction and reality convene.
Here is to mention what Anna Tibaijuka, (executive director of United Nations-Habitat program) recalls on the '2007 State of the World report[9] regarding struggles to change our cities. Tibaijuka:

"*Charles Dickens, Emile Zola, Jacob Riis, and Edward Mayhew were instrumental in improving the urban policies of their day. Today, researchers and authors […] help sensitize the larger public to the major issues of our time".*
In the UN-Habitat documentary called Slums, she adds: "*The first solution is awareness, about the magnitude of the urban challenges […] democracy, solidarity, equity and to see [people] as an asset*[10]".

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[6] http://www.gapminder.org/
[7] Idem
[8] e.g. OECD Organization for Economic Cooperation and Development
http://www.oecdwash.org/DATA/online.htm
World Bank
http://devdata.worldbank.org/data-query/
Social Watch
http://www.socialwatch.org/en/portada.htm http://www.benetton.com/colors/issues/57/mob04.html
Unesco
http://portal.unesco.org/en/ev.php-URL_ID=29008&URL_DO=DO_TOPIC&URL_SECTION=201.html
UN Habitat
http://www.unhabitat.org/
[9] Idem
[10] Quoted by Hans Rosling in UN-Habitat film on slums.

Her position goes in line with what Richard Florida[11], expert in creative cities, have said about the last book of Charles Landry (another city specialist) called *The Intercultural City*[12]. Florida reads: "*there can be no truly creative or competitive cities without first having curiosity, compassion, conviviality and co-operation*.'

All these nouns: compassion, equity, sensitivity, creativity, go in hand with the arty approaches embarked on design studies because, as Andrea Branzi[13] states: "Art is what really pierces society".

Nowadays legitimated disciplines have realized not only the importance but imminent necessity of looking beyond the boundaries of each official rank of knowledge in order to simplify, because what is simple is what the folk actually gets, and Art in its many forms being it cinema, photography, sculpture, public art, etc., is in its interlinked approaches, a way of translating scientist's findings into folk's language.

UFOs

What basically differentiates a filmmaker's envisioning from any vision coming for instance, from design, is that design is called to act on non-fictional basis. But, could fiction be a resource, a way to depict improving scenarios regarding urban lives in planet Earth?

A primary response could be found in Ron Burnett[14], who states:
"*I have been involved in Cinema Studies for over forty years. At that time cinema studies were not considered to be a legitimate discipline […] the work of filmmakers like Jean-Luc Godard, Ingmar Bergman, François Truffaut and Italian directors like Antonioni, Bertolucci, Fellini and Pasolini combined with an explosion of creativity in experimental cinema [opened] a window and often a mirror through which individuals could reflect not only on art, but also on their status and identity within western societies. Unlike other activities, the cinema's links to popular culture, encouraged new ways of thinking about hitherto dominant notions of high culture. Simultaneously, pop art was transforming the modernist trajectory in the visual arts incorporating everyday objects and sign systems into artistic visualizations and representations. […] This convergence along with the scholarly work of McLuhan, Innis and Carpenter in Canada, Christian Metz, Roland Barthes and Claude Lévi-Strauss in France […] were part of an intense period of creation and reflection on the status of cultural forms and their impact*."

As seen, regarding cities improvement various disciplines not just urban planning architecture or politics but ethnography, psychology, economics, literature, filmography, photography, public art and design have step into the city's discourse. For instance the Roman collective Stalker (homonymous of 1979 Tarkovskij's film leads "transurban" actions by crossing on foot interstitial zones of cities such as Rome, Milan, Turin, Paris, Berlin and Miami to develop an analysis and intervention methodology on those pieces of urban space in continuous but unconscious transformation.
When practicing what Stalker calls "transurban" crossings, and that we for the purpose of our research adhered as deriva, (urban drifting for other authors[15]), many

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http://www.gapminder.org/
[11] Richard Florida, author of The Rise of the Creative Class
[12] http://www.comedia.org.uk/pages/home.htm
[13] Branzi Andrea. Interview by Mendoza Andrea. Milan 2007.
[14] President of the Emily Carr Institute of Art + Design in Canada
http://www.eciad.ca/~rburnett/Weblog/archives/2007/09/film_studies_fu_1.html
[15] e.g. Baudelaire's flâneur, or urban drift carried out by Dada, Situationism and Psychogeography. See http://devenirnomada.blogspot.com/

of the so far invisible or unrecognized urban objects, subjects and situations in the grid of the city start rising. What we would like to highlight here is that if one is keen to acknowledge them, the fact of identifying these objects may give a key to build up not only the future of the cities but to re-think its here and now.

On this regard (*deriva*) I will recall the peer reviewer of this paper who in his/her assessment presented a great knowledge regarding the *deriva*; he named a list on how can it be applied:

"… urban drift:
- a collaborative platform for contemporary urban strategies
- networks initiating and supporting urban interventions
- hybrid urban praxes
- opening up and communicating architecture to a wider cross cultural audience
- inventing and presenting urban survival strategies
- inventing time-based architecture (projects that take account of time factors) permanent, transitory, temporary and ephemeral
- urban transformation and the reanimation of lost, forgotten, and hidden city spaces
- responding to drift-inspired random movement
- trans-cultural collaboration-
-the city as a medium (scavenging; remapping; re-sampling the city through light, sound, and text; life as a survival form of urban nomads; the reinvention of spaces; intervention; curating, refocusing, making aware or explaining urban conditions (misconceptions, realities, and myths)
- working with the city's second skin (virtual worlds, gaming, and computer gamers whose lives have been transformed by the emerging genre of Massively Multiplayer Online games (MMOs)
- facilitating a mobile and fluid urbanity
- reading the city as text
- deciphering psycho-geographies of the space for better possibilities to refine interrelationships
- the creation of urban situations
- looking for, reassigning functions and values of peripheral urban spaces
- process-driven urban design
- building and reducing urban voids
- animating urban life
- evolving knowledge about the insert something artificial into what is real will distort reality
- container cities; city in a state of flux; but modular; viral; transportable and translatable sometimes but not always elsewhere;
- drift via text; smart materials; mobile technologies; and new hybrid cultures in urban design; soundscapes; multiple identities, etc."

We would just add that it was not clear to our peer reviewer the fact that we are here trying to address which is the possibility that urban drifting has as a possibility to be given to citizens of go and recognize, with a arty-some approach, the primal creativity that their urban dwellings display and then, having acknowledge it, go back home to, take what they find out there as instance of what a civilization may be so that consequently they feel prompt to awake and activate their primal creativity, the one with which we all given our human condition are entailed. In so doing valuable worlds from Solos practices could, according to us, emerge.

Now, there is to say, not to conclude, that art do and will play an important role in the long term run for design because as said, art is what really has, is and will, pierce the

social tissue (Branzi 2007[16]) hence is a strong prompter of behavioural changes in people. In words of designer Bruce Mau[17]:
"The future of art will be to recover optimism and beauty. Which, I think it largely abandoned in the 20th century. There are some historical reasons that make sense with that".

I would also like to add that the title of this paper "UFO" has not been lifted from "UFO Belgrade", as the peer reviewer suggests, but still, having gone to know explore what it is/was, UFO Belgrade seems very appealing and worth seeing for those interested in the peripheries of city's contemporary discourse.

Time, an ephemeral dimension

The ephemeral although permanent presence of objects such as the one of the Simits, are platform to set three different, but interlinked conversations.

Firstly, individuals assembling artefacts like the one of the Simit's example, have somehow a capacity to "travel" in time.
Like subjects of a fictional movie, they seem to fluctuate between past, present and future in an almost… candid way. At times they look like coming from a post-catastrophic world in which resources of the planet are gone, but they came back successfully because thanks to their flexible minds, their nomad and low consuming rate lifestyles they could survive. Other times, they look like coming from the past bringing with them a rich source of knowledge, traditions and wisdom that contemporanity has forgotten and that is of precious value to our present generation.

Secondly, the Simit's example brings to the floor the afore mentioned discussion that Giddens posts[18] as the necessity to daily invent and re-invent our living ways and thus overcome the challenges of contemporanity by constantly updating our biographies, in other words, it is a call to activate our primal creativity everyday.

On a third moment there's the role of artefacts as pre-political solutions. To enter this third moment, we contradictorily bring a politician to talk about it.
When asking[19] Antanas Mockus, former Mayor of Bogotá, Colombia if, in order to get citizens acting together as a whole what planet Earth may need is a sort of alien invasion…, which kind of invasion should it be? Mockus answers that:
"*who has to invade us is the Other the one in which we are not enough thinking nowadays*".
Solos then match with what Mockus calls the: "Time Machine experiment".
Mockus:
"*I have proposed in various conferences the topic of the Time Machine, meaning: you take our grand-grandsons and imagine that those grand-grandsons discover a time machine and have the possibility to come back and show us the planet we are leaving them and so they try to correct us, to persuade us, to make us think in the other; […] it is possible that the most alike people to whom the grand-grandsons could be identified to, are Solos, so positively what we need is learning to look ahead by looking back* […] *Citizenship culture looks for organizing the transition to an accomplishment of the law, sometimes even modifying the law…*" meaning rules

[16] Branzi Andrea. Interview by Mendoza Andrea. Milan 2007.
[17] http://www.stockexchangeofvisions.org/vision.php?id=295. Last access May 24, 2008.
[18] Giddens, A. (1991), *Modernity and Self-Identity*, Oxford: Polity Press, 1991.
[19] Mendoza Andrea. Interview to Antanas MOCKUS, former Mayor from Bogotá – Colombia. Bogotá, August 2007

coming from the relations that systematically, as Christopher Alexander has proven, are already set into motion out there, on worldwide-streets.

Where then stands Design?

What could happen to design if in the near future the urban-daily objects with which humankind fulfil urban-daily primal needs were not bought, but created and re-created by "users" themselves? What if given contemporary limits citizens of/in/for/with the world started activating their inner creativity to give solutions to their needs?
Breaking, stretching, bending, crushing, cracking, folding the stuff around us (as Bruce Mau's suggests in his Incomplete Manifest) is what, maybe we could be triggering citizens to do, triggering them to observe, to learn from what others are already putting into practice, to arrange their daily lives in such a way that this arrangement can derive in a mutual social arrangement.

In a world where the discussion on human permanence in the planet points out to imminent-catastrophic insights, it seems that not only for the sake of future generations, but for the here and now, what we need is to focus on the possible positive suggestions of such fictional insights, and identify the positive potential objects, subjects and behaviours that could improve life conditions in the cities of planet Earth.
How can /could this be done?
By prompting an appropriation of the urban realm in non-Solos citizens by means of a jointure art-design, meaning, by using for example:
a. activating or being platform for the above mentioned strategy of *deriva* to prompt primal creativity in non-Solos audiences.
b. by giving room to design so that their fixed categories can move gently and independently from mainstream and or too perfect design tactics, as B. Mau's[20] suggests:

"If you think about design independent of form and visual practice, and you push it through to designing what we need… in terms of "what are the possibilities", whatever form they take[…] and, use the visual to articulate those possibilities […] ultimately to think, ok, what are the capacities we need to develop to solve this problem or to meet this need… It'd change fundamentally what the categories of design are".

The End

In the movie man in Black[21] they say that:
"On average, there are 1500 aliens on planet Earth, and most of them are located in Manhattan"…
Solos, instead, are not, or not just located in Manhattan; they keep on arriving/emerging in big metropolis in order to infiltrate themselves in the public realm and thus make not just a living but a life. Important is that whereas one can disagree or ignore the fictional existence of aliens and their invasions in movies, the existence of Solos and their non-professional creativity is real, they do exist, and are part of the engine which daily starts up the dynamics of this complex transition that the planet is experiencing.

[20] http://www.stockexchangeofvisions.org/vision.php?id=295. Last access May 24, 2008.
[21] http://www.imdb.com/title/tt0119654/

To conclude, there is to say that Solos, their invented artefacts and behaviours are instrumental in prompting a change in the perception of contemporary needs, being those basic or not.
Solos' solutions are not apocalyptical, rather are portraits of what is presently going on and could be seen as depictions of a positive alternative to shift our linear schemes of mere production, consumption and behaviours related.
Like that, we, as designers, have the capacity to create, recreate and prompt primal creativity in other layers of society.

Because of their infiltration capacity, their invisibility, their weird artefacts, their somehow abilities to anticipate events bringing back forgotten knowledge and practices and specially because they don't practice the art of shopping in planet Earth, it seems that ignoring these Solos would not be the solution to actually improve our societies or prevent urban dwells from worsen, because if we look closer, Solos may be "bringing a message" from that other space in which they dwell, an urban space that we all cross everyday but that somehow we are forgetting how to navigate in.

At this point, we can almost assure, that you have seen an UFO (Fig.1) in your life, the question now is:

Are you ready to ride on it?

Fig. 1: Palermitan Solo riding his UFO

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

A vision of an *urban countryside*.

*Service Design as a contribution to the rururban planning**

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Abstract

This paper aims to present, from a Service Design perspective, a scenario of sustainable development for a critical and crucial context: the *rururban* territory i.e. the *periurban* area that lies between a town or city and its rural surroundings.

It is here that urban and rural dynamics meet, creating unique opportunities (or risks) to improve the quality of everyday life and make a decisive step towards sustainable territorial development.

This approach, uses Service Design skills to help us visualise empty or pending urban spaces as a rich, multifunctional territorial resource, where virtuous local interactions among actors create a network of services that can support urban planners and architects in giving shape to the territory.

The paper presents an Italian research project developed for the Agricultural Park South, surrounding the southern part of the city of Milan.

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* This paper s the result of a collective work, but, for the proposes of this publication, A. Meroni has written the paragraphs 1-6, G. Simeone has written the paragraphs 3-4, P. Trapani has written the paragraph 2-5.

1. Background: *rururban* territory and virtuous networks

The so called *rururban* territory (Donadieu, 1998), i.e. the *periurban* area that lies between a town or city and its rural surroundings, is a critical context for the sustainable development of any urban area. These areas are subject to urban expansion where formerly separate cities and towns merge into vast urbanised zones: *periurbanisation* may be described as a process that integrates rural areas into systems organised around cities, and such a process has heavy spatial and social consequences, resulting in what Gottmann called a *megalopolis* (Hugo and Champion, 2003) The way this comes about is crucial for the development of a region. It is here that urban and rural dynamics meet, creating unique opportunities (or risks) to improve the quality of everyday life and make a decisive step towards sustainable territorial development.

According to the European Spatial Development Perspective, the kind of *urban-rural partnership* is a key issue: to define the nature and structure of this partnership, a multidisciplinary approach is needed, crossbreeding contributions from the disciplines of finance and economics, urban planning, geography, sociology, agronomy and landscape architecture (Landry, 2000; Viljoen, 2005)

Recently, Service Design has also taken up this debate, and this territorial application looks extremely promising for this new discipline. Collaboration would appear to be particularly promising with the so called *Scuola Territorialista* (Magnaghi, 2000), which seeks to valorise territorial heritage (environment, urban settlement, culture and society) as the only possible and fundamental approach to producing a lasting enrichment of an area. According to this approach, places are the result of a historical co-evolution of human settlement with environment, nature and culture, whereas the recent functionalistic approach tends to consider the territory as a kind of technical support for activities organised independently from the local means, resources, potentialities and qualities.

In such a framework, the concept of sustainable development not only refers to the reproducibility of natural resources, but also to the way in which urban systems are established; to the coherence of productive systems with local resources and entrepreneurship; to the development of capability and self government by local communities.

Service Design contributes to this approach by observing local social innovations, meaning local virtuous and promising activities in different areas of doing, and interpreting them as forms of interaction and exchange of benefits that call for proper (or better) infrastructure and support. Virtuous and promising activities are those able, in everyday life, to bring individual interests into line with social and environmental ones (Manzini and Meroni, 2007). In different ways and for different motivations, such behavior often means *radical changes* in the way practical problems are solved, and would appear to represent a positive step towards sustainability, drawing the interest of an increasing number of people. It has been argued (Meroni, 2007) that since such bottom-up initiatives, along with the Creative Communities that activate them, are deeply rooted in local territory, they can be considered the starting point and the stimulus for a new generation of collaborative services (Cipolla, 2004) within a scenario of Diffused Social Enterprise (Manzini and Meroni, 2007). In other words, Creative Communities together could mature into a form of social organisation where a larger number of people are enabled to organise themselves to achieve results that interest them, while producing sociality and environmental quality.

Because of the common interest in understanding the link between people and places, and between virtuous initiatives and promising models of settlement, this Service Design-driven approach to social innovation can also conveniently integrate the urban planning approach of the *Scuola Territorialista.* Its contribution consists in offering another disciplinary viewpoint and

methodological toolbox for generating a new paradigm of urbanisation which grows out of an understanding and enhancement of local virtuous initiatives, rather than a techno-functional ratio, in a vision of connected and symbiotic networks.

Given the previously discussed critical state of *rururban* territories, where open spaces tend to be inundated with building or treated as residual gaps, the combined approach to territorial development of Service Design and territorial Urban Planning could lead to an experimental one, where local interrelations become dominant and generative, so that even empty or pending urban spaces are seen as rich, multifunctional territorial resources, where virtuous local interactions create a network of services fulfilling ordinary needs and, at the same time, producing sociality and environmental quality.

In such a collaborative pattern, after an initial phase of identification and understanding of local best social innovation practices, the Service Design aim would be to outline corresponding *service models* to be utilised in generating a *scenario framework* for the development of the territory: a scenario that, in seeking to facilitate virtuous interactions, would foster an urban planning strategy able to support Diffused Social Enterprise.

2. Social innovation and experimental projects

This essay presents part of the results of an Italian research project, founded by the Italian University and Research Ministry (PRIN, Miur, 2006 - 2007) for the Agricultural Park South, surrounding the southern part of the city of Milan, in region of Lombardy. This area is an emblematic example of the previously described situation, currently suffering from highly speculative pressures and a lack of vision in terms of a possible sustainable partnership between the town and the productive countryside. The aim of the research was to construct a theoretical and instrumental foundation for a new way of designing urban settlements.

In view of their specific areas or interest, the cases of social innovation here considered can be partially gathered under the umbrella of the so called “solidarity economics networks” (EQUAL, 2007) and are mainly related to three fields of activity: 1) the production, exchange and consumption of food; 2) leisure in the area between town and countryside. 3) the innovative housing and hospitality system in the *rururban* areas.

They demonstrate the presence in the Lombardy Region, and in the Milan area in particular, of a lively humus of activities, already creating a virtuous, but still fragile, network in the territory: numerous examples of solidarity purchasing groups, community supported agriculture, farmers’ markets and direct sales, organic and quality food production, agritourism initiatives for proximity leisure, innovative housing and working typologies. Even though these virtuous initiatives are currently working, they are the result of a sort of *early stage heroic effort*, and lack any real supporting system and any effective transversal connection.

Besides this emerging local reality, it is useful to observe some experimental projects in various parts of the world that exemplify how to use the Service Design approach to integrate the competences of the various disciplines working on territorial development. We will briefly discuss two cases where the approach and field of application are of particular interest:

_ Dott2007 (*Design of the time 2007*) is a national initiative of the Design Council aiming to explore what life in a sustainable region (i.e. North East England) could be like and what role the Service Design discipline can play in achieving it. Spotlights are on five aspects of everyday life: movement, health, food, school, energy. Dott2007 promotes a “less-stuff-more-people approach”, where services help the community to share the load of everyday activities: eating better food, caring for sick or aged people, looking after children, going on holiday, washing clothes and so on. It is a matter of providing instruments to develop personal visions and scenarios, rather than teaching people how to live.

_ VEIL (*Victorian Eco Innovation Lab*) is devoted to research, innovation, creation and testing of fruitful long-term (typically 25 year) scenarios for sustainable solutions: concepts for sustainable products, services, built-up environments and lifestyles in the Victorian region of Australia. The project promotes an interdisciplinary research environment: an evolving 'think-tank' referred to as *the Hub*. It matches different contributions in constructive speculation; calls on the university design program to re-invent the future; presents new products, services, systems and life-styles to be tested in real everyday life; drives investments and social tastes to expand the request for eco-innovation; helps professionals to develop a successful career dealing with these issues; matches the best research with government policies. These long-term visions and eco-innovation ideas are also taken up as '*design studio*' topics for the university design schools (and as student competitions). At the end of these design studies, the students' work is sent back to the VEIL, and the most promising ideas are discussed in a *post-production workshop*, involving students, hub members and professional designers. Here, the projects are revised in order to make them suitable for communication to the general public and media, and then discussed.

Both examples show some common points that can be considered essential in a Service Design driven approach to sustainable development:

- they present a high degree of multidisciplinarity;
- they involve the different local actors in a co-design process, and put them in direct relation with each other;
- they stimulate a self-help attitude and develop community capability by providing enabling tools and creating the conditions for the birth of a flexible socio-economic system;
- they rely on the strengths and on the opportunities offered by the local territory.

3. The scenario framework: hypothesis and objectives

The real problem of defining a urban identity of *periurban* areas is the apparent lack of profitable and practicable alternatives to production sites, housing or offices. However, increasingly supported by current reality, the researchers hypothesised the profitable feasibility of developing existing small agricultural concerns in a local network, taking into account local resources and opportunities offered by the local territory.

Work was based on two main hypotheses:

- only by using local resources (Mirata and Ristola, 2007) and activating collaborative and open services (Cottam and Leadbeater, 2004) is it possible to make real, tangible and effective improvements in quality of life and environment.
- local collaborative patterns, involving both local inhabitants and enterprises, can lead to powerful social innovations able to radically change settlement models, by changing underlying practices (Latouche, 2004).

In this conceptual framework, the role of Service Design is to interpret, activate and develop such collaborative local enterprises, in order to provide them with a more favourable ground to flourish (EMUDE, 2007). This means, first and foremost, creating a network of interconnected and complementary *service models* able to develop a different partnership between town and country. To use the tools and the language of the discipline, this partnership typology defines the *scenario framework* (Ogilvy 2002) that challenges the overflow of urbanization by presenting sustainable alternatives: *periurban* areas are seen as places where the *network economy* meets the *collaborative service pattern*, giving rise to a vision of an essentially *multifunctional urban countryside* where:

- the food system aims to increase regional self-sufficiency through local food sale and the de-mediation (Meroni, 2006) of agricultural production. This still remains the most important function of periurban agriculture (Petrini, 2005);
- relationships between rural areas and the city are strengthened in terms of material, economic and cultural flows, and rationalized according to a sustainability assessment;
- enhanced agritourism activities add a new perspective to proximity leisure ;
- locally focussed, regional economies generate income and improve labour opportunities (Fleury, 2005);
- closed loop systems use better and cycle the results of rural activities within a logic of service symbiosis (Mirata and Ristola, 2007);
- good practises and *soft policies* can play a significant, structured role;
- traditional and new communication technology fosters the constitution of collaborative communities;
- agricultural activities can inspire new urban lifestyles by promoting the diffusion of technologies that allow urban farming (green walls and green roofs, simplified hydroponic and aeroponic systems), ease the spread of a new generation of urban cultivators and, at the same time, increase the quantity and quality of urban green (public and private)

4. The scenario for the Agricultural Park South

The work presented here is an action research project conducted by a multidisciplinary team, in 2006-2008 under the auspices of the Italian University and Research Ministry. Its aim was to lay a theoretical and instrumental foundation for a new way of designing urban settlements, through the proposition and visualisation of a scenario of sustainable development for the great *periurban* area of the Agricultural Park South.

This area, made up of different kinds of field partially rented out to farmers and partially owned, is managed and overseen by the local authority for the Province of Milan.

It is an area currently in decline as small farmers abandon the fields, and the soil is overexploited by agro-industrial production. It is also subject to aggressive building programmes and, as their contracts expire, leaseholders fail to invest in new infrastructures and services. Even the small producers are not stimulated to invest money in the agricultural business, which is no longer profitable in a mass distribution scenario. Despite this situation, the previously described solidarity economics network (a mix of Creative Communities and Creative Entrepreneurship) has emerged, and seems to open the way to a sustainable development.

The project has taken this virtuous situation as a starting point from which to develop a coherent system of interconnected territorial service and actor networks, mutually reinforcing and producing business and society.

This system consists of eight *service models*, which we will describe briefly, that take their inspiration from the observed reality. Per se, they are not yet networked or multifunctional, but they are the basis of the entire system.

The collective Park brand

What shared identity can we attribute to this park which is able to characterise its activities? What does this identity entail?

The answer is a brand that denotes the short chain initiatives and activities that are the result of networked collaboration between different actors (eg: food box subscription with products from different local farms; agritourism hospitality combined with other leisure and catering services etc.)

The authority issuing this brand could be a consortium of producers, or the local authority for the Province of Milan, which wants to promote and support the quality of Milanese local products. The products awarded the brand must be the result of collaboration among different local producers; there must be a set percentage of products/services distributed at local level; the products/services must be produced and delivered according to eco-friendly production techniques (biodynamics, biologic and integrated systems…).

Farmers' market: the market for the Park's produce and services

How can the Park and its produce be brought into the city? How can the city feed on its territorial produce? Where can a trip from the city to the countryside start?

To enable short sale from the producer to the consumer, the Farmers' market can be placed in dedicated areas within the most important street markets in the city, following a weekly rota. Organized by a consortium of local producers, it can support the de-mediation of both product and services, encouraging access to the park from the city.

Local product and local services can be sold side by side as in a new kind of street market, where people can find "packages" to enjoy the territory (bicycle rent discount, restaurants), last minute offers of surplus produce and a refreshment point, providing take away food and ready to eat snacks, made with local produce.

Public green procurements: green purchasing

How to transform an administrative protocol into a landmark for aware consumers and enlightened producers? How to organize local windows for the exchange of high quality produce and services?

The Consortium of Local Producers can be the promoter and the provider of this service. It can create touch points between virtuous producers and critical consumers through the realization of critical mass and the organization of shared platforms for goods exchange based on the model of group purchasing organizations. The solution works like an auction where the discount of the products increases with the increasing of the amount of people who join the auction, so building critical mass. Consumers can join the service either through a *digital window* or a local agent, who is a resident of the Park, paid by the service provider.

The food box subscription

How to supply the city with local produce through a convenient and advantageous service? How to give commercial continuity to the producers?

The food-box is a de-mediation service promoted by a consortium of producers, or by a bigger farmer and his network of small suppliers. It is conceived to be accessible in terms of costs, because of the cut in long distance transport, and in terms of convenience, because of the regular home or near-home, delivery. The consumer can personalize his/her purchase by choosing the products he/she wants, how much and how often according to his/her needs.

Visitors' centre: the Park Points

What could a "visitors' centre" look like in an agricultural park? What is it possible to find there? Who takes care of it?

Park Points are welcoming place, located at strategic points in the Park. They combine physical access to the territory with access to its knowledge and its produce. Here it is possible to find an info point and local produce on sale at the same time; or it can also be the starting point for special routes and itineraries and offer agritourism hospitality, etc.

This service is like a mirror of a Farmers' market: it is a territorial agency for the park within the Park itself, and it also sells produce from the closest farms, whereas the Farmers' market is a place where the visitor/consumer can get in touch with services and information to visit the Park and where he/she can buy local produce. A Park Point can also work both as a welcoming centre and as a logistic sorting hub linked to the Farmers' market and vegetable orders.

The rural cultural centre (at a historical building)

How to create an active cultural place in a Park? Where is it convenient to place it, what is it possible to find there, what is it possible to do? Who takes care of it?

The idea of a Cultural Centre is to enhance the value of local biodiversity through activities carried out by scientific researchers (from Universities) and experienced local farmers.

It should bring together a seed savers' association, a botanical multimedial library and a botanical garden, working together. It a place of knowledge and study of local cultivation and traditional farming techniques and is also a consulting window for local producers on advanced farming techniques (advanced organic and biodynamic cultivation, the use of indigenous species etc.). Since this is intended to become a point of attraction in the park, it should be located in a building of historic or other particular interest.

Horticulture

How is it possible for an amateur to enjoy taking care of a vegetable garden in the Park? How can the Park be made more beautiful, vital and healthy with the help of amateur gardeners?

The service transforms available fields on the farms into amateur allotments to cultivate as small vegetable gardens. Amateurs can pay a rent to the host farm or a fee as part of the association that organizes the service. The garden is hybrid space where individual and collaborative activities are connected, as for a *time bank*. When a farmer needs help in his/her activities he/she can rely on an internal exchange of favours and products, managed on a credit system. .

The design of the service facilitates the internal exchange system, which needs to be organized and balanced to make collaboration as friendly and easy as possible.

Urban indoor/outdoor agriculture

How is it possible to enjoy cultivating a vegetable garden in the city? How can 0 mile fresh and biologic vegetables be produced?

Advanced building and gardening technologies can help urban farming: from great metropolises to smaller towns several solutions like green walls and green roofs, simplified hydroponic and aeroponic systems, are getting footing in urban environments to fulfil the need of citizens to cultivate their own food.

The service is intended to give advice on implementing such solutions, based on fixed parameters like the season, the space and the energy available, light and water requirements and so on. It can support users in setting up and maintaining their own vegetable gardens.

5. Service structure and organization

These eight *service models* are quite consistent with each other, but a deeper analysis is required to understand how they can overlap, integrate and share resources so to create a symbiotic network.

In order to do this, a frame of analysis has been developed breaking the services down into assessable elements (Jegou, Manzini and Meroni, 2004) The different elements (the minimum material or immaterial self coherent constituents needed to deliver the services) have been clustered under the following categories:

- Logistics and infrastructures
- Material goods
- Immaterial goods
- Human resources
- Communication

All the eight service models have been analysed using these criteria, so as to understand how they overlap and complement each other, giving rise to possible synergies or closed loop systems. Taking the Farmers' market (FM), the Horticulture (H) and Park Points (PP) as examples, it emerges, for instance, that:

- FM and PP can benefit from sharing logistic systems, means and storage: a well equipped PP would appear to be a convenient collection and transit point for the FM;
- since PP and H, both need an accessible location, they can often be merged. Additionally, the two services both need to attract people for working and for leisure, so the amateur farmers can play an important role in animating and making the PP work:
- FM and H call for similar management actions and tools, so they can share the same system of managing work credits/debits.

By repeating this analysis over and over again a conceptual map of possible integrations emerges, where it is possible to see:

- an overlapping of the elements: potential economies of scale and convenience in joining the services
- complementary elements: potential economies of scope and convenience in linking the services.

Using this method it has been possible to establish guidelines that make a convenient multifunctionality in the agricultural service system feasible.

6. Conclusions: networking and multifunctionality

The services described here propose a vision where agricultural activities, and particularly food production and exchange on a local scale, become the means of sustainably developing *rururban* areas. They rely on direct relations (de-mediation) between producers and consumers, and their collaborative nature blends the roles of the actors, highlighting the need for a local rural-urban production partnership to produce territorial value.

They become profitable precisely because they use the local resources to best advantage: as a matter of fact, the availability of such resources and the possibility of having direct control over them, as far as quality and quantity are concerned, is the distinctive and key factor that enables small business to use them in a beneficial way, making the difference in the market. This allows small enterprises to create the distinct features in their offer that attract the critical consumer; controlling these resources is the way to activate a quality market beside the mass one.

Nevertheless, without a network strategy able to share and complement assets and resources, they are unlikely to have sufficient power to influence the way the territory takes shape: only when and if these services become self-sustaining, will they be capable of creating a social and economic territorial humus that can counter the building speculation.

In order to support their diffusion, Service Design aims to make them more accessible and affordable for a larger target of users and, at the same time, more practicable for a larger group of producers (Manzini and Jégou 2003). In such a framework, the network strategy is a way of increasing both options and benefits to users and effectiveness and convenience for producers.

The functional basis for building the network is the need to share or complement the main elements that constitute the services. From a social and relational perspective, the key point is to enhance actor perception of a coherent community where everybody contributes to collective success.

This approach can lead to a feasible concept of multifunctionality, where activities become conveniently manageable by the actors, not wasting working capacity, but rather increasing it. In these terms, the collaborative aspect of these services is also a way of relieving the farmers or the associations in charge of the territory, of the burden of delivering several services. A self help group of amateur farmers can, for instance, cultivate a field on the farmer's property with a relatively autonomous attitude, using equipment in exchange for labour. A group of professional farmers can run direct sales more easily by managing turnovers and sharing logistics. A group of experienced agricultural enthusiasts can effectively help the less experienced in approaching the cultivation of native species, or processes, much better than a consultancy.

The emerging network (an articulated model of *Community Supported Agriculture)*, a way to exchange or pool resources and competences, can be seen as a web of interconnected and complementary services in the territory, which operatively tends to concentrate around crucial points where, for the convenience of the enterprise, several service models can coexist. We can call these points *territorial service ganglions*, because of their crucial role in making the whole system work. They result from the sum of different overlapping and complementary opportunities, where food production, exchange, hospitality, leisure, cultural and social activities create a unique mix of functions, adding value to the territory even simply by avoiding its exploitation for building.

The *ganglions* are the key points of the system, with a multifunctional role. They can be seen as the result of the functional optimisation of business and the convergence of social and human energies around an epicentre of entrepreneurship, which could be a community or a business with the social innovator characteristics previously mentioned. In fact, management of the *ganglions* calls for actors with a distinctive and outstanding entrepreneurial attitude: farmers, associations or other enterprises that, like the *creative communities*, are already notably active in the territory and whose current activities will be enhanced by this new role.

A *ganglion* manages considerable flows of goods, resources and persons, gathering together several smaller activities. Because of the availability of adequate resources and infrastructures, and its strategic location, it plays the role of strategic operational support for businesses gravitating around it: it can better express its own potential as territorial enterprise, by making it possible to activate a win-win alliance with smaller businesses in geographic proximity. Back to the example of a possible convergence of Farmers' market, Horticulture and Park Points, a *ganglion* can be a Park Point endowed with a logistic platform for gathering the product for the

Farmers' Market, at the same time selling part of them, and hosting a community of amateur gardeners.

The possibility of activating synergies or sharing with other businesses in close proximity is, moreover, a way to create virtuous circles that also valorise the offer of leasehold-farmers unable to benefit from huge investments in adequate standards of service. This dynamic can activate an *economy of reciprocity* where services and goods are exchanged outside traditional market rules, creating a flexible local system.

For all these reasons the *ganglions* are the means by which *soft policies* (bottom-up rules and behaviours self-imposed by local communities in order to increase quality) are implemented in the territory, and are also crucial points where institutional policies and local Authorities (Landry, 2000) could really and effectively support them in producing a sustainable local development of *urban countryside*.

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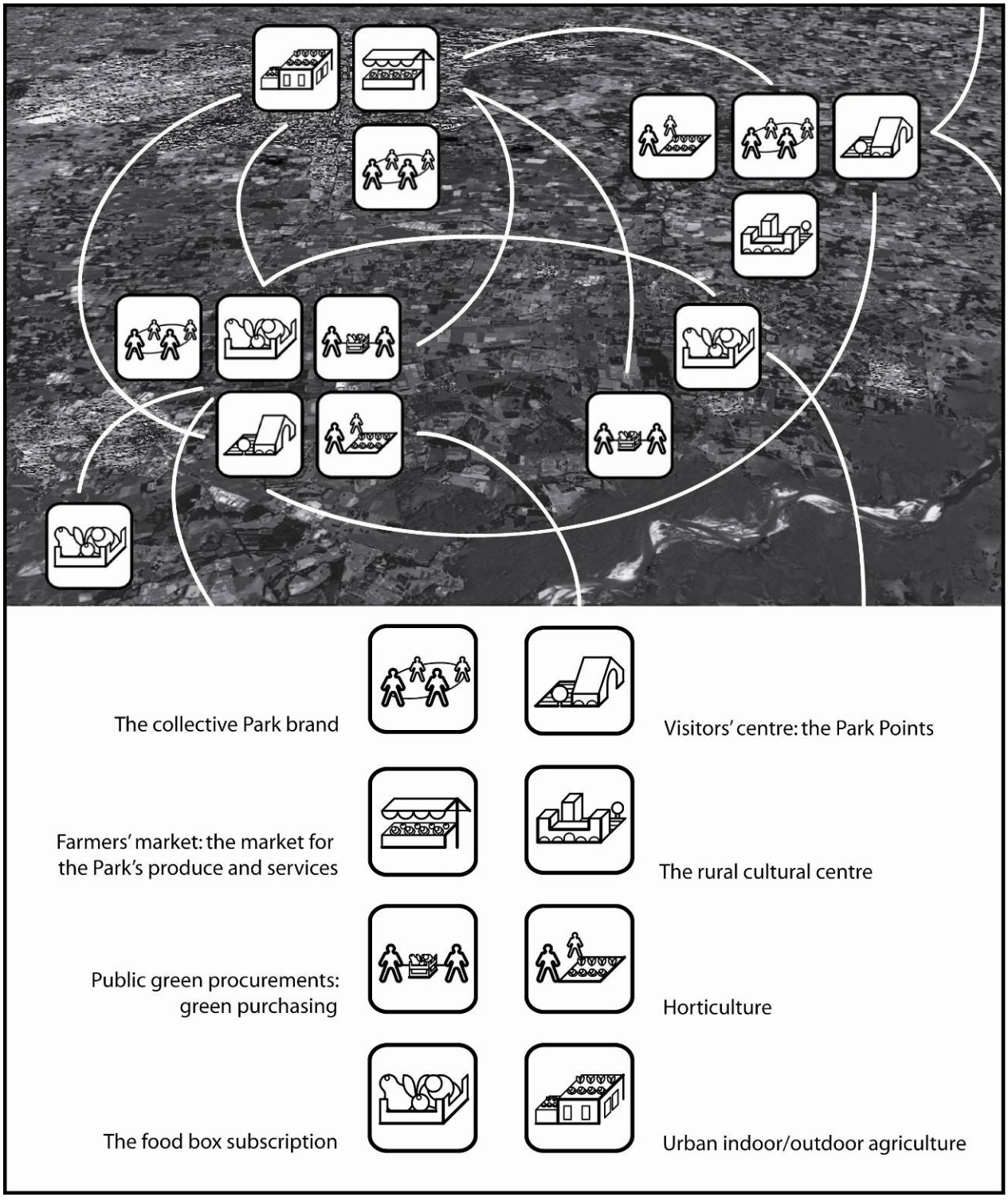

Fig. 1: Conceptual map representing the designed *service models* and their combination in territorial networks gravitating around main *ganglions*.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

An inconvenient arrow

Visual explanations of ecological cycles in science learning material

Annegrete Mølhave[1]

Abstract

This paper discusses the anlaysis framework and critical review of visual explanations – eg diagrams – of ecological cycles. It focuses on visuals from English and Danish biology and chemistry textbooks [1930-2008] for 14-18 year olds. Diagrams of ecological cycles [eg carbon-, nitrogen- and water cycles] are common elements within such textbooks.

Given the current focus on sustainability, as well as carbon and nitrogen emissions in the environment, these visuals are essential in developing public understanding of such important scientific concepts. The review finds, however, that imprecise categorisation of information in diagrams may cause ambiguous messages about circulation of matter within cycles. The review method is then proposed as a generative tool to define practical design briefs.

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1. Visual explanations of ecological cycles

A visual explanation is a visual artefact predominantly in pictorial and schematic mode aimed at describing in detail a specific content. This paper discusses the anlaysis framework and critical review of visual explanations – eg diagrams – of ecological cycles. It focuses on visuals from English and Danish biology and chemistry textbooks [1930-2008] for 14-18 year olds. Ecological cycles [eg carbon-, nitrogen- and water cycles] are cyclical networks in which matter is recycled in a continuous sequence of processes. Diagrams explaining these are common elements within such textbooks [see figure 1]. Given the current focus on sustainability, as well as carbon and nitrogen emissions in the environment, these visuals are essential in developing public understanding of such important scientific concepts. The review finds, however, that imprecise categorisation of information in diagrams may cause ambiguous messages about circulation of matter within cycles. The review method is then proposed as a generative tool to define practical design briefs. The work presented here is part of graphic design PhD-study which aims to identify the rationale informing the transformation of information into visual explanations of ecological cycles in reviewed material. The visual content analysis is complemented with 24 semi-structured interviews with designers, editors, and authors at 3 publishers in UK, 3 in Denmark, to investigate the design process and rationale for transformation of information.

Structure of paper

1) Visual explanations of ecological cycles
2) Visual survey: description of methodology and sample
3) Theoretical framework for visual syntax and review criteria
4) Review of information categorisation in sampled diagrams
5) Conclusion – visual review as a conceptual design tool

2. Visual survey: description of methodology and sample

Three textbook collections were searched for visual explanations. Denmark and the UK were chosen to enable comparison between two different sized commercial publication markets:

- National Textbook Reference Collection, Institute of Education, London,
- Curriculum Resource Collection, Institute of Education, London,
- National Textbook Collection, Denmark's University of Learning.

609 books were searched. Pages, which include visual explanations of the three cycle subjects, were collected, resulting in 260 examples. The extent of the collection is as follows:

Books

Danish publisher*	23
UK Publisher	134
Total	**157**

* Translations: 1 Japanese original and 2 UK originals.

Author-teams

Danish*	19
UK	105
Total	**124**

*Includes 3 Danish editors overseeing translation.

Publishers

Danish	9
UK	48
Total	**57**

Curriculum levels

14-16 years	167
16-18 years	74
Other*	25
Total	**260**

*Includes primary, university, popular science *etc*.

Visual explanations/Cycle types

Carbon	97
Nitrogen	83
Water	48

Other*	32
Total	**260**

* Includes e.g. oxygen cycles.

Organising the sample according to year, publisher and type of visual revealed the ubiquity of one diagram type: a linking diagram in which objects are linked by arrows. Each time [260 instances] a single or groups of visuals is used to explain the cycles, this diagram type is included.

When other types of visuals complement the diagrams, they follow a narrow path of exploration in terms of both media and themes. Only 12 non-pictorial visual explanations such as graphs and charts occur across the three cycles.

In particular, the carbon cycle explanations are not supplemented with pictures until the 1980s; however, the nitrogen cycle includes earlier examples. The most common feature here is a visual explanation of root nodules eg a photo. During the 1990s the nitrogen-related themes expand towards the farming context, but lightning is a repetitive feature as well. A recurring feature in carbon cycle examples is photos of decomposition or decomposers (earthworms or fungi). Very few visual references are made to global warming.

This indicates stagnation, within educational publishing, in exploration of visual modes and theme of these cycle subjects. Further scrutiny of diagrams produced by the individual publishers reveals several patterns of repetition of whole diagrams or individual visual elements such as:

- straight re-print
- re-use in different titles
- questionablly close reference to other material
- re-use of individual graphic elements ie pictorial objects.

In terms of developing graphic design practice, this apparent stagnation is regrettable.The linking diagram is a thoroughly established convention for visually explaining flows and interrelations within systems. As such the diagram structure itself is not questioned here. The success of the linking diagram is partly due to its simplicity in using arrows, text and possible pictorial objects to show complex systems. The simple combination of graphic objects, however, increases the demand for precision when applying complex information to the elements. Imprecise categorisation may create ambiguity. This issue has been highlighted by several authors (eg Tufte 2006, Bertin 1983). Most appropriate to this study, Stylianidous et al (2002) tested students' reading of images in science textbooks. They found that students had difficulty interpreting different meanings [polysemy] applied to pictorial similar objects such as arrows.

To investigate the precision with which information is categorised in the diagrams, a set of review criteria was established based on theories of visual syntax, as now discussed.

3. Theoretical framework for visual syntax

When transforming textual information into a visual explanation the designer engages directly with the compositional rules of visual language – visual syntax. As in verbal syntax, basic units – here graphic objects – and their interrelationship create the meaning. The review applies

Engelhardt's (2002) theoretical framework for analysing visual syntax in the diagrams, because it expands on the detail handled in Richards' earlier model (1984/2000-1/2002).

Following Engelhardt's approach to decomposition of graphic representation a linking diagram such as figure 1 consists of:

'A *graphic space* that is occupied by it, and

A *set of graphic objects,* which are contained within that graphic space, and

A *set of graphic relations* in which these graphic objects are involved. '

(Engelhardt 2002, 14).

For the following review, analysis of *graphic space* is excluded in favour of detailed analysis of graphic objects and their relations. Engelhardt defines three basic graphic objects: *text*, *shapes* and *pictures* (2002, 119). Two types are thus present in the above diagram: text and shapes [arrows], which are involved in a set of simultaneous *object-to-object relations.* These include:

- Node/connector roles
- Arrow types/meaning
- Verbal semantics and syntax
- Visual attributes: Type hierarchy, colour and shape

Nodes, connectors and labels

According to Engelhardt graphic objects applied in linking serve two syntactic roles: *nodes* and *connectors*. 'A connector is a graphic object in the shape of an arrow, band or line that is anchored to two other graphic objects (nodes), connecting them.' (2002, 40). Thus where arrows commonly are perceived as dynamic objects (Richards 1986, Bertin 1983, Tufte 2006), Nodes take on a more passive role by *being* connected.

Engelhardt further states that an object may serve the syntactical role of a label, if anchored to another object. semantically, the meaning of the lable 'specifies information about the labelled object. (Engelhardt 2002, 34). For precise distinction between word objects in reviewed diagrams, nodes are here defined by their position between an arrowhead and an arrow tail.

The diagram analysed here thus consists of five nodes and six connectors [arrows]. Thus two overall categories of information are established through the visual syntax: 'DECOMPOSERS…' SOIL…, PRODUCERS…, CONSUMERS… and sunlight – the node category – are *connected* by decay, water and salts, die [twice] and eaten – the linking category.

Arrow types

Arrows are the most common type of shape in the 260 reviewed diagrams. Engelhardt (2002, 42) defines two types of arrows, according to the concept they represent:

A *connector* – an arrow leading 'from a *source object* to a *target object*'.

Movement arrow – 'physical *movement through space* of an object'.

He further expands the connector with two types (2002, 102-103): *physical* links and *conceptual* links. The first type occurs eg in wiring diagrams, the latter frequently in cycle

diagrams, eg in figure 3, ‘decomposers…’ and ‘soil…’ are conceptually linked by the process ‘decay’. Hence each type of arrow represents an individual type of information.

There are four conceptual links in this diagram: ‘Decay’, ‘Die’[twice] and ‘Eaten’. These are events that conceptually connect the organisms in the nodes. Eg decomposers and consumers are conceptually linked through the event of death.

‘Water and salts’, however, are substances that move from the soil through the roots of the plant. Thus this *connector* arrow may in fact be read partly as a *physical link* ie the roots of the plant, and partly as a *movement* arrow. In the latter interpretation, the arrow represents the movement through space of salt and water, from the source object – the soil – to the target object – the plant.

The sixth arrow qualifies as a connector, by being anchored to the ‘sunlight’- and ‘producers’-nodes. It may however, simultaneously be interpreted as a *movement* arrow, ie sunlight moving towards the plant. In this latter case, the movement is *of* a *source object* to a target object, rather than *between* the two. Thus Engelhardt’s movement arrow may be further distinct between movement *of* a source object and movement of a third entity *between* a source and a target object.

In summary, the visually similar six arrows represent a set of three arrow types – hence information categories: 4 conceptual connectors, 1 physical and 2 movement arrows each representing a different type of movement. As an additional ambiguity, two arrows may each be interpreted as dual types.

Given the visual similarity of the arrows, the arrow labels become increasingly important for interpretation. This will be discussed next.

Verbal semantics and syntax

Besides the nodes, words appear as *labels* in the diagram. These are anchored to the arrows through spatial proximity.

Within the reviewed diagram several types of word categories exist. These may be distinguished according to the concepts they refer to – semantic categorisation, and according to grammar – their verbal syntactic structure.

The nodes

In terms of meaning, three nodes, ‘DECOMPOSERS bacteria and fungi’, ‘SOIL minerals and humus’, PRODUCERS green plants’ ‘CONSUMERS animals’ refer to an established taxonomy of biological organisms. This taxonomy is, however, visually categorised similarly to soil, a related but distinct concept. Furthermore, the latter node’s sub-groups are distinct types of information [a mini-taxonomy]. ‘Minerals’ is chemical- and ‘humus’ organic matter. Sunlight, the fifth node refers to solar energy, a third type of concept. In terms of syntax, the nodes all represent entities by use of nouns.

Links

Imprecise labelling of arrows adds to the above confusion. Semantically the verb ‘eaten’ is transient, whereas ‘die’, and ‘decay’ are intransient verbs, which can be used without an object. ‘Decay is, if read as a noun, also a process ‘Die’ and ‘eaten’ represent two different object/subject relations. Producers are ‘eaten’ by consumers, but producers also ‘die’ and in reality are then ‘eaten’ by decomposers. Thus two processes are included in the latter arrow, one of which remains implicit.

‘Water and salts’ are distinguishable from the other labels semantically by referring to entities rather than actions, and by their verbal syntax as nouns.

By omitting a label on the arrow leading from the ‘sunlight’ node this arrow is open to interpretation. The origin of the graphic arrow symbol, from archery, and its omnipresence as representation of direction (Gombrich 1983, Westendorp 2002) increase the likelihood of this arrow being read correctly as a movement arrow, the node [sunlight] thus moving towards the plant. If read as a conceptual connector the implicit process is photosynthesis.

If the latter two arrows are read as movement arrows, these combinations thus refer to a *transfer* of matter or energy, rather than the *transformations* embedded in the other four arrows.

From this analysis three general semantic categories may be identified. Present are processes, energy, and organisms/material. One category commonly found in the sample’s other diagrams is excluded – the explicit mention of ‘matter’ eg Carbon. Two overall types of processes happen to two types of entities: transfer and transformation of energy and matter. In addition to this, the 6 arrows represent 6 explicit and 3 implicit information categories. Of further concern is the noun syntax of ‘water and salts’. If read as a movement arrow, the similarity in verbal syntax to ‘decay’ may cause the latter to be interpreted as a movement arrow, the process thus physically moving through space, rather than conceptually linking decomposers and soil.

At both the syntactic and semantic level ambiguity is increased due to the similarity in visual attributes of the graphic objects in the diagram. This issue will be discussed next.

Visual attributes: Type hierarchy, colour and shape

Visual attributes may be applied to Individual Graphic objects or groups. Word-based objects and shapes have separate conventions for attributes based on similar principles.

Visual attributes

These were formally defined by Bertin (1983) and later refined by Engelhardt to include: colour, shape, direction, texture, size, value, and position. Variables can be applied to ordinal, numerical or nominal groupings created between graphic objects.

As the arrows in the diagram are the same colour and shape, they create visual association. Their direction follows the spatial position of the nodes in an organisation that does not reflect the physical reality. E.g. soil is positioned above the animals. As mentioned in the analysis, in reality the arrows represent distinct categories of information on several levels. In this case the symbols, which represent different types of information may, however, be read as synonymous.

Typographic variables

Words may be distinguished through the following typographic attributes.

Category	Variables
Type style	Regular Italic Bold Underline

Case	Upper and lower case
Orientation	Horizontal or variable
Size	One size or ordinal hierarchy

Each of these attributes may be applied to associate or disassociate one word or sentence from others. Additionally, the ‘size’ and ‘upper/lower case’ attribute creates a hierarchy. In the reviewed diagram a hierarchy is created in the nodes through application of uppercase. The second level of these hierarchies is confusingly similar to the arrow labels and the ‘sunlight’ node.

Implications of analysis

The deconstruction of a diagram undertaken served as part of an initial analysis of the entire diagram sample. By breaking down the information into visual syntactic, verbal semantic, and –syntactic layers several instances of imprecise information categorisation were identified.

Review level	**Options**	**Applied in Mackean 96**
Visual syntax	Nodes and links	Nodes and links
Arrow types	Four types	3 types
Semantic level	Four overall groups	3 present
Verbal syntax	Limited by grammar	Consistent nodes, inconsistent arrow labels.
Visual attributes – arrows	7 variables	Colour and direction
Visual attributes – typography	4 variables	Upper/lower case

Hence information is categorised across six different levels in this diagram. Apart from the simple visual classification of node and links through words and arrows, inconsistencies were found within each level. This imprecise visual categorisation of information may distort the central message about what is being recycled; and how, where and when it happens. Part of this problem is the marriage of simple graphic objects and complexity in the information conveyed by them. Thus the analysis raises a question of how the information may be simplified by complementing with other types of visual explanations.

Based on these findings, review questions and criteria were defined for the three levels of analysis, as will be discussed next.

4. Review of information categorisation in diagram sample

The analysis and review of the diagrams seeks to evaluate the consistency in information categorisation within each level of review categories as well as consistency in their interrelations.

Presented here is the review of the sub-groups including text and arrows only. This choice demonstrates the complexity of applying information to the simplest graphic object combination.

The following questions are applied for the review:

Nodes and links

What semantic groups are included as nodes?

What semantic groups are included as arrow labels?

Are semantic concepts applied consistently within nodes and arrow labels?

Verbal syntax

Is the application of verbal syntax consistent within nodes and arrow labels respectively?

Arrow types

Which types of arrows are included?

Are any arrows dual types?

Visual attributes – shapes

Which visual attributes are applied to the arrows?

Are they applied consistently?

Visual attributes – typography

Which visual attributes are applied to the arrows?

Are they applied consistently?

Description of sub-sample for review:

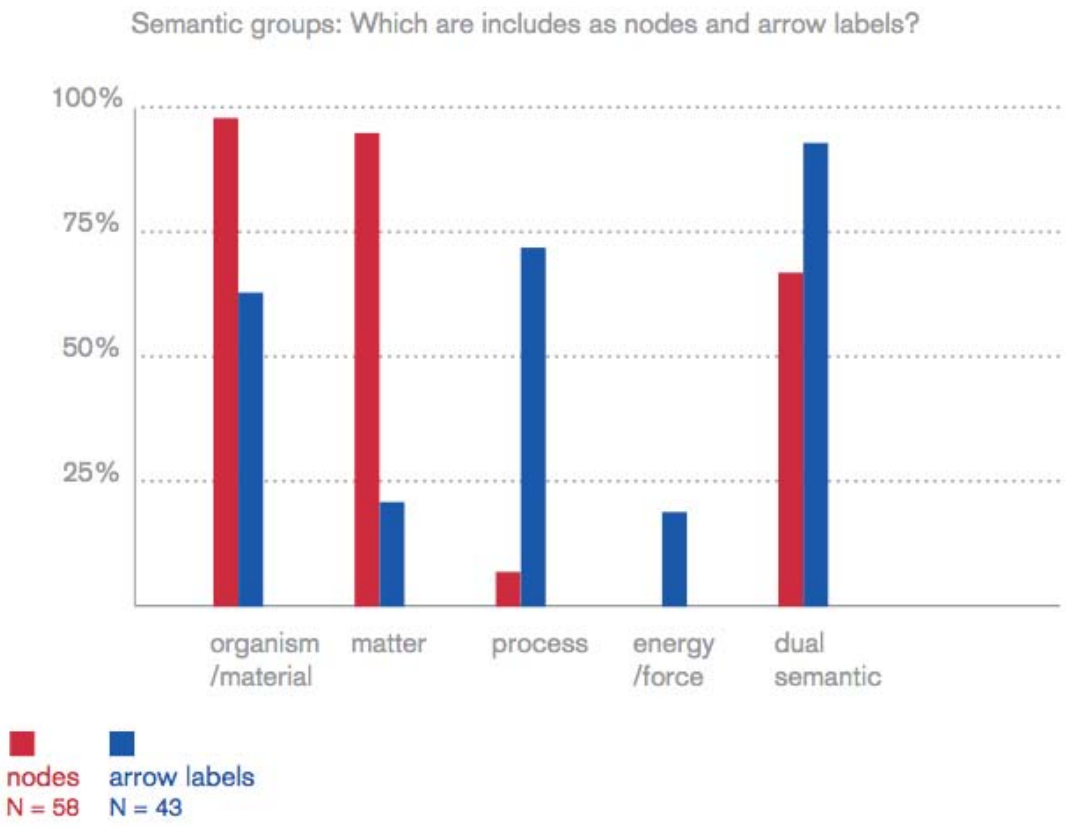
The overall diagram collection has been categorised according to the types of basic graphic objects [text, shapes and pictorial] included. I will here present the findings about the most simple combination, the group including only arrows and text. This sample includes 60 diagrams, raning from 1935-2007.

Description of matrix method

Each diagram was analysed and the data plotted in a matrix, comprising 1 column per diagram and one row for each review criterion. 17 diagrams include only unlabelled arrows and 2 diagrams include labelled arrows but no defined nodes. Thus the matrix includes 43 link columns, 58 node columns.

Findings

Semantic groups – which are included as nodes and links



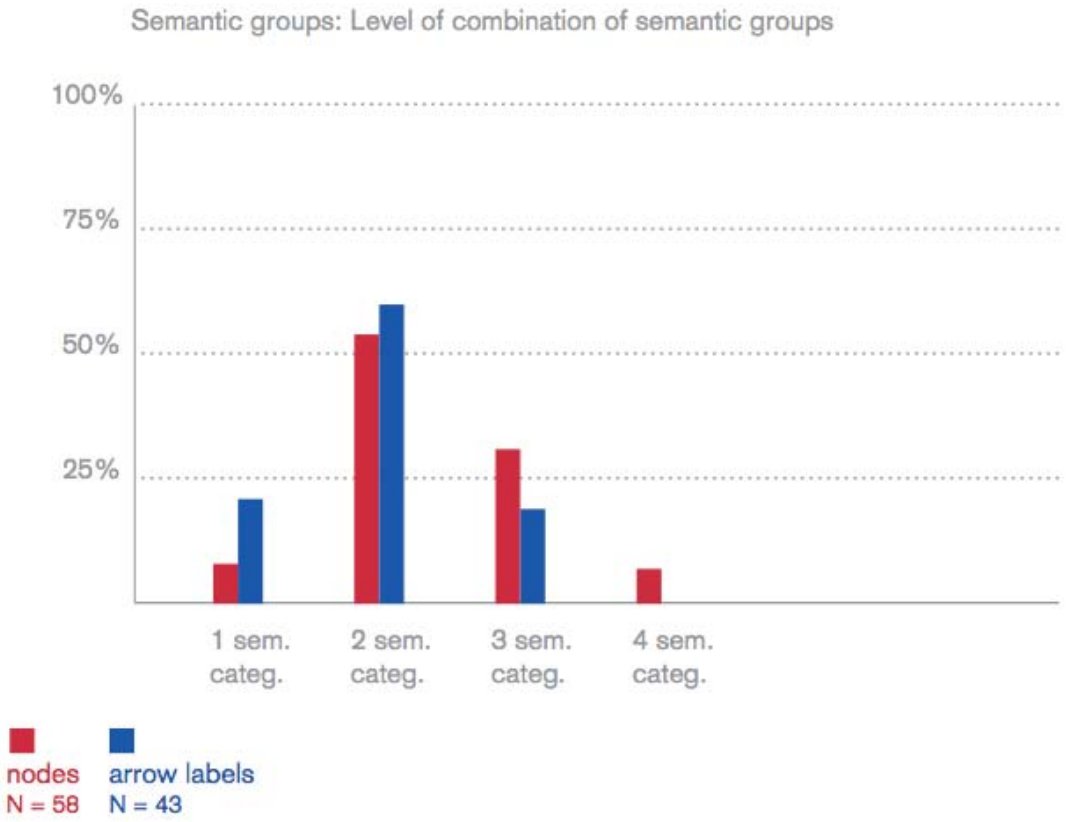
Nodes

By far the most common semantic group included as node is organism/material, appearing in 98% of the diagrams; this reflects the static nature of these elements. The high proportion, 67%, of the diagrams, which include dual semantic categories, is of some concern, as two concepts are here applied to one graphic object.

Links

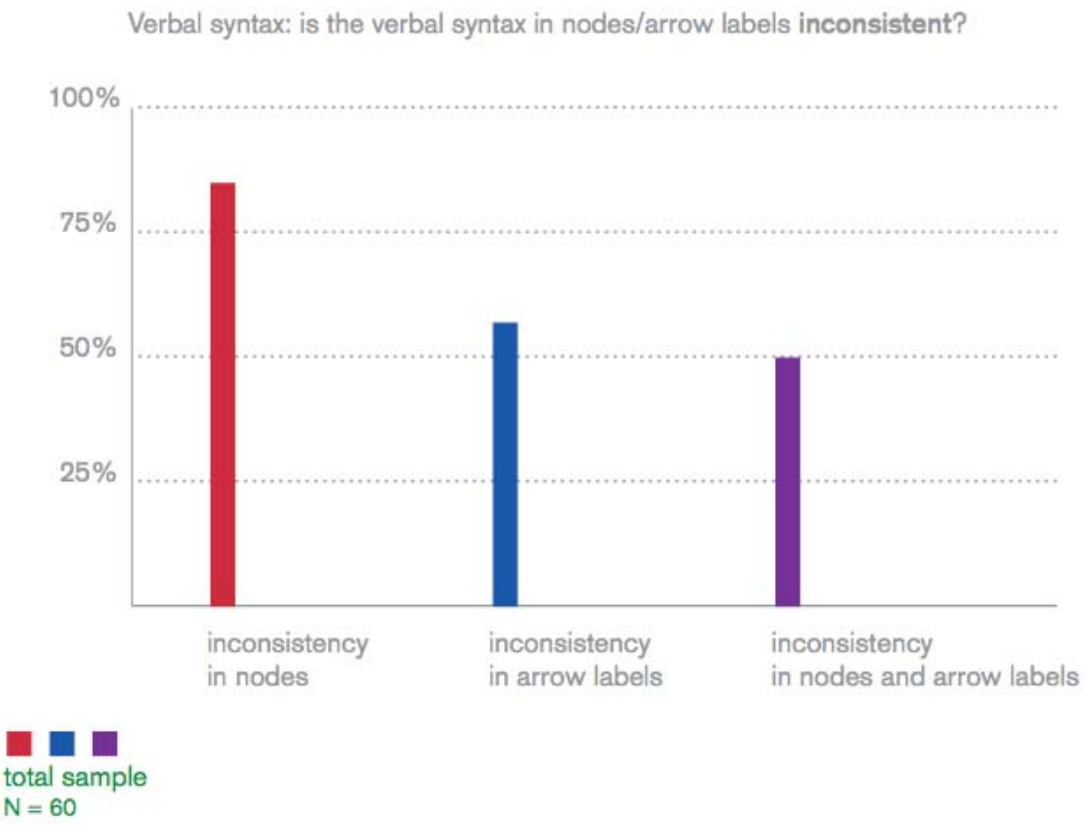
'Process' appears in linking positions in most diagrams, closely followed by organism/material; these two are often applied together e.g. 'respiration of plants'. Interestingly, matter is present in linking objects in only 21% of the diagrams. Thus matter is frequently categorised as a passive element e.g. 'stored 'in an organism, rather than actively circulating in the cycles. Notably 93% of diagrams with labeled arrows include at least one instance of dual semantic information in a label. These arrows thus represent two different types of information. Further scrutiny of diagrams that include 'process' in arrow labels revealed that each one of these represents the process with a noun e.g. 'photosynthesis'. This creates two ambiguities: if read as a movement arrow, photosynthesis is thus an object being transferred; secondly, the process is spatially positioned outside of the node, or organism, in which it takes place. I.e. photosynthesis happens in 'open air' between the atmosphere and a plant, rather than inside the latter.

Semantic groups – level of combination of semantic groups



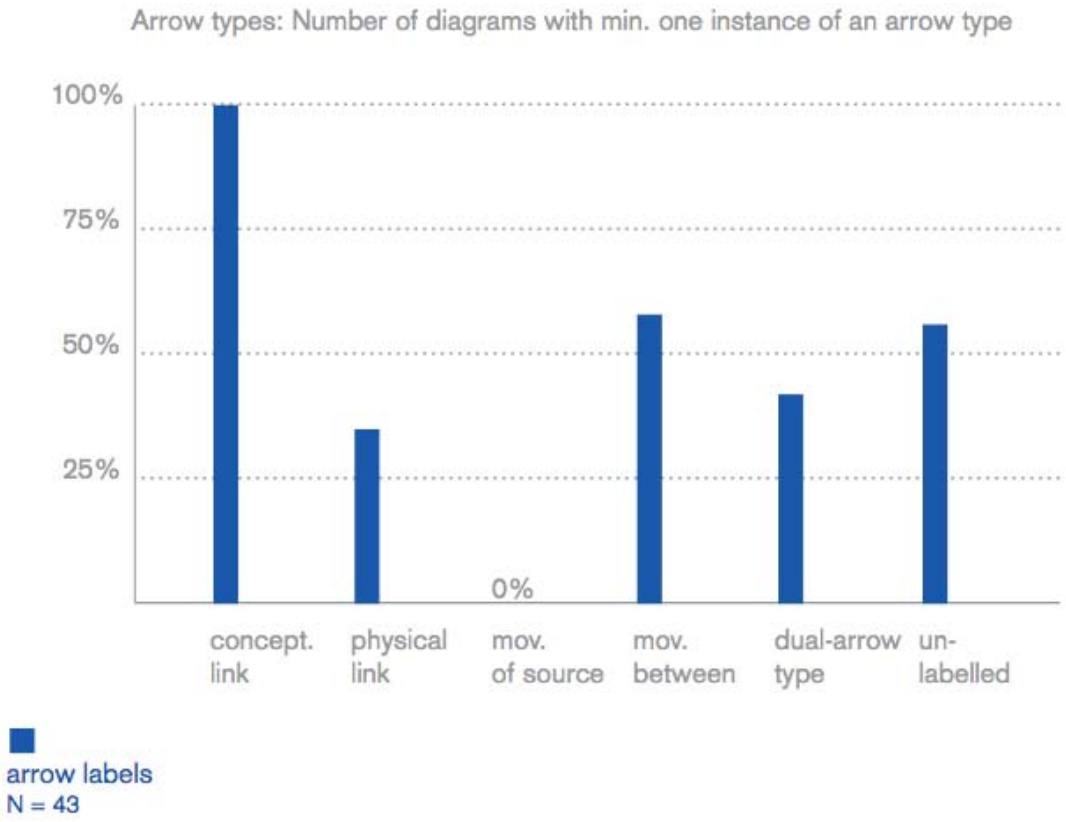
Only 21% of diagrams include only one semantic group in the arrow labels whereas 8% of the node groups are consistent. In both groups, the combination of two semantic groups is most frequent.

Verbal syntax – is the verbal syntax of nodes/labels applied inconsistently?



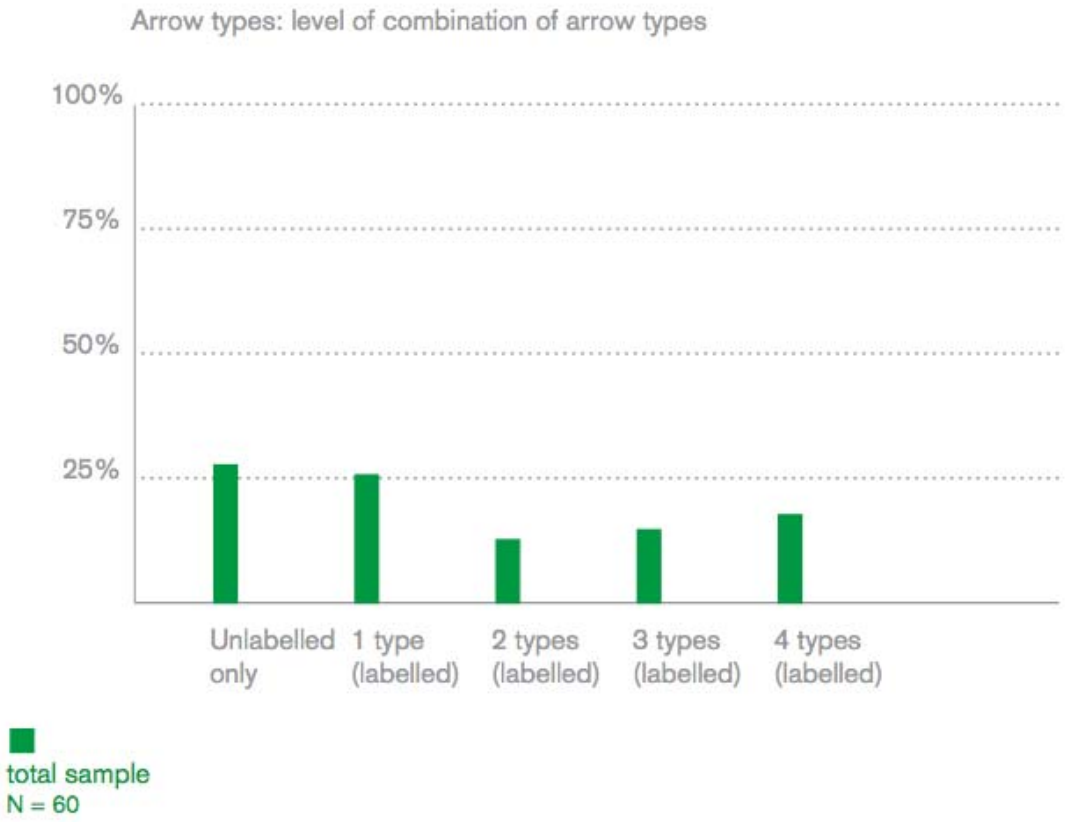
A worrying 85% of the 60 diagrams are inconsistent in use of verbal syntax in nodal position. Less ambiguity is seen in the arrow labels; however, 50% include imprecision in both arrow labels and nodal verbal syntax.

Arrow types – which types of arrows are included?



The most frequently included arrow type is a conceptual link occurring in all of the 43 diagrams which include labelled arrows. No diagram includes movement of a source object; however, nearly half apply movement of entities between nodes. In 42% of the diagrams at least one instance of dual-arrow types was found, creating additional ambiguity. Similarly worrying is the 56% of the diagrams which include one or more non-labelled arrows. This latter imprecision leaves the interpretation entirely up to the reader to resolve.

Arrow types – level of combination of arrow types



The 17 diagrams with non-labelled arrows are left open for the reader to define the type of connections involved. A quarter of the diagrams include only one type of arrow. Instances of combining 2, 3,or 4 types occur with roughly the same frequency.

Visual attributes – arrows

Only four of the 60 diagrams apply visual attributes other than the ubiquitous direction variable. Here texture distinguishes nitrification- from denitrification processes (Godwin 1948), chemical methods from biological process (Daniel 1954), or line width is applied to indicate quantities in flow (Palmer 1954, Kolb 1963). Thus the the designer is overlooking an opportunity to apply a range of visual vocabulary to increase the precision, hence succeeding in getting the basic concepts across to the reader. This missed opportunity is similarly evident in the application of typographic detailing.

Typography

Most diagrams apply different typographic treatment using a range of variables in nodes and arrow-labels. Below follows an overview of the 14 different combinations of typographic attributes present in the sample.

	Italic	Bold	Underline	Upper/lower	Direction	Size	No. variables
Regular only							1
1						•	1
2		•					1
3				•			1
4	•	•					1
5					•		1
6				•		•	2
7				•	•		2
8		•			•		2
9					•	•	2
10		•			•	•	3
11	•				•	•	3
12				•	•	•	3
13		•		•	•	•	4
14		•	•		•	•	4

If no typographic detailing is applied increased scrutiny is demanded from the reader to distinguish nodes from arrow labels. This treatment thus increases the effort needed to disambiguate if several semantic categories are added to the node and link categorisation. In older examples, direction is commonly applied to distinguish horizontally positioned nodes from arrow labels, which follow the arrow direction. Contemporary examples rely on horizontal typographic direction. This increases the demand for other attributes to emphasise the difference between nodes and arrow-labels. Like upper/lower case combinations, size may be applied to create emphasis on nodes or in some cases hierarchies within the set of nodes. Individual elements emphasised with size is commonly ‘nitrogen…’ or ‘carbon dioxide…’ ‘…in the air’, ‘plants’ or ‘photosynthesis’.

Analysis of the typographic styling revealed that only 2/60 diagrams are consistent in typographic styling of the semantic and verbal syntactic information types: Daniel (1954) and Atkinson (1964).

Generally, the content in the diagrams thus appears analysed to the extent of forming node and connector categories but stops short of distinguishing different types of information within these elements.

Overall only three of the reviewed diagrams were identified as consistent in their categorisation of information (Daniel 1954, Atkinson 1964, White 1939). These all include nodes and unlabelled arrows and one semantic category. When several semantic categories are applied in either nodes or arrow annotations, an illogical and ambiguous sequence appears. This may include one step being an organism *eg* 'plant', whereas the next step is a facilitator of a process *eg* 'bacteria'. Thus, whilst the linking diagram accommodates sequence and stages in a process it appears that the three semantic categories of the cycles are more complex to explain in this diagram.

Implications of review

Linking diagrams, as reviewed here, consist of 2 graphic objects: words and arrows. The complexity of information needed to describe ecological cycles, however, increases the demand for precision with which information is applied to these objects. This analysis identified six levels in which information can be categorised when applied. Several points of concern were found due to polysemy or imprecise categorisation of information, resulting in ambiguous messages. Of particular concern is the polysemy created by the 67% dual-semantic nodes and 93% dual-semantic arrow labels. The inclusion of non-labelled arrows among labelled ones creates further ambiguity. In terms of the actual cycle subjects, the majority of the diagrams represent matter as a passive element stored in organisms or entities. Processes, on the other hand, due to their noun syntax may be wrongly interpreted as objects circulating between organisms.

Given the high level of ambiguities found, the above-mentioned uncritical repetition of diagrams and their elements in textbooks is worrying. The stagnation in visual exploration is further evident in the omission or imprecise application of visual attributes. To address this stagnation, the review presents a method with which practical visual exploration may be approached. Based on the review findings, a set of design briefs may be defined. These are centred on three themes as will be discussed next.

5. Conclusion – visual review as a conceptual design tool

When utilised as a generative design tool, these research findings enables construction of a design brief that will increase the precision and coherence of the visual explanations. As such the concise analytical findings produce systematic underpinnings for a practical exploration. Three themes are identified for such future activity:

1) **Types of linking within elements – based on arrow types**
   The four arrow types, conceptual and physical linking, and two different types of movement may be explored to create understanding of interrelations within the elements of the cycles. Such exploration could focus on matter as the circulating element.
2) **Semantic groups**
   further visual scrutiny of the semantic groups could be explored. This includes differences between matter in storage and circulation, and transfer and transformation processes. Starting points for these would be external factors' effect on the concepts eg time, energy, force and location of the elements.

3) **Visual attributes**
   Current application of visual attributes touches upon quantities of flow. Several other quantities such as time or amount in storage could similarly be explored.

Thus it is suggested that a simple, one semantic, linking diagram is complemented with visual explanations of the cycles' behavioural aspects. The latter focusing on basic combinations of information categories. Given the identified rarity of other types of visual explanations, the possibilities of applying the existing visual vocabulary of information design remain wide open.

This review focuses on 14-18 year olds in formal education. Ecosystems are however communicated daily to general audiences eg in newpapers. Here frequent use are made of diagrams applying the same compositional principles as reviewed here. Discussing visual explanations, Edward Tufte (1997, 10) noted that 'Since such displays are often used to reach conclusions and make decisions, there is a special concern with the integrity of the content and the design.'

Increased demand in reader effort to disambiguate the message may thus affect the motivation to understand the subject at the very heart of our wider social learning process. This, in turn, highlights that skill and precision is crucial when applying information design's tools and visual vocabulary, regardless of the context.

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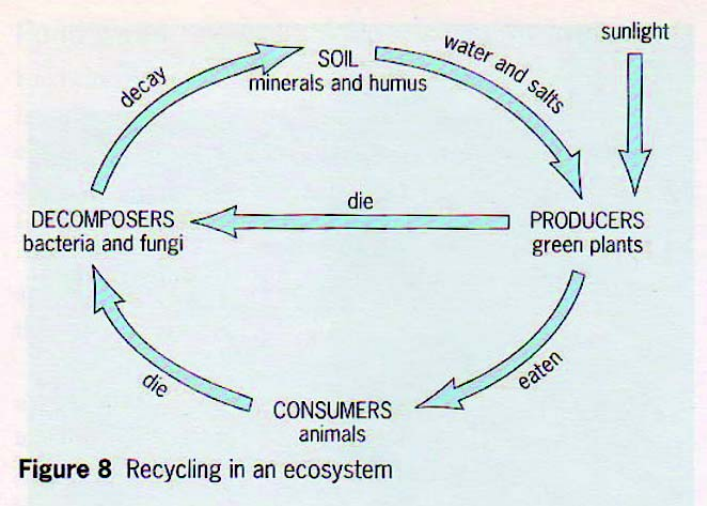

Fig. 1: diagram of an ecological cycle from MacKean (1996)

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Product service systems and non-market oriented approach

Methodological and ethical considerations from a design perspective

Nicola Morelli [1], Wolfgang Jonas [2], Juliane Munch[3]

Abstract

Contemporary social and economic changes are forcing firms and institutions to focus on local and highly individualised solutions. The challenge is not only to provide local and highly individualised solutions, but also to propose strategies to transfer and reproduce the solutions in different local contexts. This would be possible by using forms of *codification* of the most relevant components in local solutions.

The codification refers to local organisational knowledge and to the way local components interacts with the others. This paper will illustrate how this process was developed in a concrete case. Through this case the authors analyse the possibility to build something similar to a source code for initiatives based on social interaction and investigate the process of construction of such a code.

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1. Introduction

The project reported here is part of a strategy to link teaching activities to applications in the real world and to design research. The actors are:

- **The students of the 8th semester Industrial Design at the School of Architecture and Design** in a Danish University: the project was the theme for a 3 weeks workshop on concept development.
- ***Focus Folkeoplysning***, (FF) a Danish organization that provides vocational education.
- **The authors of this paper**, who, in the last few years, have been working in different institutions, on themes related to system design and service design.

The opportunity came from a loose cooperation between FF and the University aiming at a new service to employ people with low employment opportunities. FF had developed the concept of the service (a meal delivery system for people working in the city centre) to the first embryonic stage and is now planning to develop the project to a running phase in a few months. The idea of the cooperation between the organisation and the university came from the discussion about designers' role in planning and developing innovative services, which is an ongoing discussion not only in Denmark.[4]

This theme is close to the more general question of relocating the role of designers beyond the traditional link with material products. This theme has been the main research focus for the authors (Jonas 1994; Jonas 1996; Jonas 1997; Morelli 2002; Morelli 2003; Morelli 2006; Morelli 2006; Morelli 2006).

The project is also consistent with the authors' research on applications of design methodological approaches to innovation in social systems, outside the traditional market-oriented context for the design discipline (Morelli 2003; Morelli 2006)

The project

Active labour market policies in Denmark and Scandinavia are based on an approach aimed at enhancing unemployed people's residual capabilities (Esping-Andersen 2002). This approach, often labelled as *active welfare* (Møller 2002; Sabel and Zeitlin 2003; Vandenbroucke 2003) or *open welfare* (Cottam and Leadbeater 2004) makes it possible to decrease the level of people dependence from the welfare system, thus encouraging the re-integration into the labour market. FF´s initiative in this area consisted in a program to employ people with different social and behavioural problems in a café, which is in most aspects similar to any other café. Here unemployed people have a regular working routine and a continuous social contact with clients. This is an opportunity to learn new skills for a good reintegration in the labour market.

The new service proposed as a theme of a workshop with design students is a meal delivery system for people working in the central areas of a city. Businesses in those areas can rarely afford a canteen for their employees. Their employees must buy their own lunch and often have very limited choices, influenced by reduced time and dietary factors. The new service is meant to connect them with small cafés and restaurants offering good quality food, to satisfy their needs and optimise the time for their lunch break. The service should serve a limited area of the city and use bicycles as the only means of transportation. As in the café, the service will employ people with low employment capabilities in five main functions: logistic, payment, IT, delivery,

[4] Several design education institutions in Denmark are focusing on service design. Service design is now a consolidated subject in design education in several Scandinavian countries and in UK. Recently service design has also been the theme for exhibitions and conferences promoted at the Danish Design Centre. System Design at the School of Art and Design at Kassel University, Germany, one of the partners in this project, is developing solutions for people; in this approach the distinction of products, services, infrastructures is a secondary one.

marketing and bike repairing (in total about 15 people). The cost of the service is meant to be very low („as much as sending a postcard“) compared to the normal cost of the lunch, decided by the meal provider. The meal provider, in turn, will contribute to the service with a small amount of money per each meal. The local government is paying the salary (the normal unemployment benefit plus a small activation contribution) plus a small amount of money per employee to support the service.

2. The research question

The project's approach to social innovation is based on the direct participation of local actors in the development of innovation. The project is supposed to generate a broad structure in which FF will organise the practical and operative aspects of the service. The assumption is that local actors (providers, customers) have context specific knowledge for generating local solutions. This kind of knowledge is often hard to transfer to system developers. Rittel (Rittel 1984) characterized this situation as a *symmetry of ignorance:* Knowledge is asymmetric: users are domain experts who understand the practice (they know implicitly *what* the system is supposed to do) and system developers know the technology (they know *how* the system can do it).

By transferring the responsibility to develop the system directly to users it is possible to capture essential knowledge that would be critical for the development of highly contextualised solutions. This condition however, would also reduce the possibility that those initiatives be reproduced in different local contexts.

This means that many of such initiatives remain isolated cases and little space is left for their broader diffusion, notwithstanding their high potential to offer concrete solutions to present crises of welfare systems. An important research question arising from this context is therefore whether those initiatives can be totally or partly transferable[5].

The reproducibility / transferability of those initiatives would be possible by using forms of *codification* of the knowledge needed for their planning and/or development. Codification implies the modularisation of the most relevant components included in a project (related to knowledge and processes) and a certain level of standardisation of such modules. In this sense codification implies a reduction of the reach and qualitative complex characteristics of local solutions into a simpler, but nevertheless more reproducible solution that could generate economy of scale or scope. [6]

The code to develop in this case includes all the organisational knowledge related to the project components, the modules and the interaction among them. Its reproducibility depends on the capability of local actors to understand and use it to generate their own context-related solution. Likewise software systems, local product-service systems can be built upon a *source code.* This contiguity, however, should suggest a set of relevant research questions:

- -Is it possible to generate anything similar to a source code for initiatives based on social interaction and innovation? What can the source code for open welfare look like? Which are the aspects of codification that contribute to the reproducibility / transferability of this kind of design interventions?
- - A further question concerns the capability for designers to contribute to generating such a source code, that means to design and represent the processes involved in initiatives of social innovation, as well as they are able to design and represent the outcome of industrial processes. Can the services in this context be compared with services developed in a normal business context? Do designers need any particular

[5] The debate regarding the question of transferability in design research is just beginning, see for example Chow (Chow 2006).

[6] It is clear that the challenge in this project is highly complex, because the knowledge to be codified does not concern a product, or a process of transformation of material parts, but it rather relates to social structures and contexts, organisational and cultural components, which are by nature harder to be trapped in a code.

knowledge to operate in the context of social services? Are the criteria to evaluate efficiency of those services the same as those used to evaluate the efficiency of market-related services? Are there special methodological requirements for the social approach as compared to the business approach?

The hypothesis is that codification is possible on the problem side (dealing with the complexity of the situation to be improved) as well as on the solution side (dealing with the contingency of the form of the new situation):

- - On the problem side we provide a methodological concept, which enables designers to systematically understand and represent highly contextualized situations and to specify processes in order to transfer these situations into preferred ones.
- - On the solution side we provide a platform concept that supports highly specialized and complex Product Service Systems in a certain field of application by using basic solution elements.

The authors suggest that, when appropriately designed, the intervention in this area may generate good opportunities for innovation. In fact the project proposes a perspective shift in the way of doing business in this area, which raise the level of social intervention to the status of a normal business.

3. Designing for social purposes

A framework of designing for social purposes

Since its first contributions (Papanek 1973) (1979)[7] the debate about a social role for designers has pointed out the need for a new approach of design to social and environmental issues, challenging the dominant logic of economic rationalism that is orienting mainstream design activities. The most recent emergence of macroscopic phenomena, such as globalisation, massive migration, population ageing and new cultural patterns are increasing the demand for new solutions to improve social quality.

The traditional approach to social intervention is based on a *relieving logic* (Manzini, 2005) that replaced products and services informally offered by families, neighbours, social networks (*informal economy*) with a set of product or services offered by a *provider* to a *consumer*, on the basis of an economic exchange. In this sense the logic of public intervention on social problems did not differ from a market driven logic. However this logic is probably very expensive in the long term, because the separation between a *server* (the institution or the private company) and *served* subjects (the citizens) considers the latters as passive receiver, thus reducing their capability to solve their own problems in the future. Furthermore this logic undermines the social cohesion that an informal economy inevitably creates.

The problem of social quality, in other words, requires a revision of the traditional logic and possibly the definition of a new approach to social action.

Design and social quality

The capability to work on local contexts emerges as a spin-off of the same phenomenon of globalisation: new technologies make it possible to reduce market segments to extreme customisation. Furthermore global companies are recognising the local capability of generating context-related solutions as a critical competitive factor (Becattini 2004). Global companies are challenged to become an active part in local networks including institutions, companies, and customers. This is changing the conception of the social role of business organizations:

[7] These are the two milestones of this debate. Papanek view was opposing market driven logics to socially oriented design, thus considering the two logics as antithetic and incompatible. The Ahmedabad declarations proposed a different view of design as *a powerful force for the improvement of the quality of life in the developing world*; thus proposing a view in which local and traditional cultures could be supported, without ignoring *the power that science and technology can make available* to them. A critical comparison of the two approaches has been proposed by Margolin (Margolin 2006)

- Rather than providing products, those organisation are now supporting local networks of stakeholders, and
- Rather than providing finited relieving solutions, they are providing semi-finished platforms, including products and services, that will enable people to create value according to their individual needs

This contextual condition would redirect the design agenda: Rather than finished material products, designers will be required to produce scenarios, platforms and operative strategies that enable small companies, local institutions, cooperative groups, association and individuals to produce their own solutions.

The long tradition of cooperation between design and industries generated an *operative paradigm*[8] (based on reproducibility of knowledge, division of labour, optimisation of resources), that can be useful to support designers working in the new context. A relevant design problem, in this context is to *industrialise* local and highly individualised solutions, that means making them *transferrable* to different contexts, in order to solve similar patterns of needs.

Design and morality – a kind of relativisation

The new perspective outlined above, together with the challenge for designers to redefine their role and activities, raise the question whether there should be a special moral code for design. Should design be a critical discipline? (Jonas 2006) argues that design (as a discipline) is *uncritical*, because it has to be. Since we are confined to the observation of observations (2nd order cybernetics), it becomes delicate to evaluate the representations of reality by comparing them with reality itself. Pure criticism, whatever that might be, is not really useful in the process; the pivotal point is missing. Critical theory, the favourite toy for some intellectuals, is broken. Criticism will be replaced by performance and appropriate methodology and the focus on the communicative process. Social systems (Luhmann 1984) are systems of communications (groups, teams, neighbourhoods, companies, social movements). System and service design is aiming at intervention strategies regarding desired outcomes. But design itself cannot define these purposes. Design can be "critical" only in the sense that it provides and illustrates different choices and puts them to discussion among the stakeholders. It has no criteria that enable decisions as to morally "good" or "bad" solutions.

We should think of replacing normativity (criticism) by "teleology" (purpose orientation) and effectiveness. Rosenblueth et al. (Rosenblueth, Wiener *et al.* 1943) re-introduced the concept of teleology into science. The critical attitude should better be transformed into an ironical attitude (Rorty 1989). Imagination, provocation, intervention, etc. are essential elements of design´s role in increasing the variety of choices for people.

Design (as a discipline) is *amoral*. The claim for ethics as a major criterion in design seems to be a symptom of immaturity. We need a moral disarmament of design in order to become acceptable to other disciplines. Ethics should be kept implicit in the process. (Margolin 1998) criticizes Simon´s (Simon 1969, 3rd ed. 1996) definition of design as "transforming existing situations into preferred ones" as "deceptively catholic". But can there be a more challenging and responsible task than this? "Humanistic" attitudes are not really useful in a time where the "human measure" is an increasingly inappropriate criterion. Only by dropping rigorous concepts of humanism will we be able to work for real people in their individuality. It makes no sense at all to work for "mankind" or for "the environment".

Design teams, companies and individuals are definitely *responsible* for what they are doing. Responsibility is only possible if we do *not* retreat to moral positions. There was the time when designers thought they would transfer real problems into real solutions. Today we know that these are just denotations indicating the starting point and the endpoint of a project. It is

[8] Arbnor and Bjerke (Arbnor and Bjerke 1997) introduce the term *operative paradigm* to indicate a toolbox of *methodical procedures* and *methodics* that can be used to apply a methodological approach to a specific study area.

more appropriate to talk about transferring system state 1 into system state 2, always having in mind the **complexity** of state 1 (perspectivity of defining / designing the "problems") and the **contingency** of state 2 (there are many possible "solutions"). Contingency is inherent in the process. Responsibility is required to deal with this perspectivity in a democratic manner, to support, for example, error-friendliness of solutions or innovations.

Designers cannot act as moral guards but rather as scouts, sometimes as jesters, hopefully as respected partners in a network of disciplines and stakeholders. Appropriate methodology, especially regarding communication, is essential.

4. Methodology

The need for accelerated and systematic innovation suggests to adopt *design as the generic process model of innovation***.** Since innovation is knowledge intensive attempts at operationalization have to integrate the scientific and the designerly process. Furthermore a successful approach has to reflect the involvement of the designer / researcher in the process.

The emerging paradigm of "research THROUGH design" (Jonas, 2007) provides a methodological and epistemological concept for the relation of "problems" and "solutions", that means for problem definition (dealing with complexity on the problem side), project formation (dealing with the process), and solution generation (dealing with contingency on the solution side). The challenge consists in the efficient operationalization.

General overview

System design at Kassel University is using an instrument for systematic problem solving and innovation, which is being developed for designers and design researchers and their collaborators (Hugentobler, Jonas, & Rahe, 2004; Münch, 2005)9. It helps to reduce complexity and uncertainty during problem solving and research, while increasing efficiency and effectiveness when collaborating with partners and clients. Moreover, the instrument provides a terminology, which improves the transferability of design processes (and possibly solution elements) towards new / similar / comparable situations. The instrument is acting from a design research perspective and is based on the assumption that this perspective encompasses social innovation processes as well as technological and market oriented R & D and innovation.

The approach distinguishes and addresses situation, process, methods and tools, and thus exceeds existing models (2005), (n.d.). It assists design researchers and their collaborators and clients to

1. Specify / categorize (problem) *situations,*
2. Match *process* patterns to the specified situation and define the *role* of design researchers in the process, and
3. Select *methods / tools* related to the process.

Theoretical background

The instrument is underpinned by a generic process model, which consists of a hypercyclic combination of the *macro-cycle (domains of knowing): ANALYSIS – PROJECTION - SYNTHESIS* (Nelson 2003) and the *micro-cycle (learning steps): research – analysis – synthesis – realization* (Kolb 1984), linearized into a "toolbox" (Tab 1).

[9] This is done in close cooperation with Deutsche Telekom Laboratories (T-Labs) Berlin, where this project is directed by Dr. Rosan Chow under the title "t.bag". The longer-term aim of the t.bag approach is the development of an integrated knowledge and communication platform for research THROUGH design. The outcomes are Product-Service-System (PSS) models in the widest sense.

	research	analysis	synthesis	realization
ANALYSIS				
PROJECTION				
SYNTHESIS				
COMMUNICATION				

Tab 1 Hypercyclic model of a generic design process, linearized into a "toolbox" (Hugentobler, Jonas et al. 2004), (Münch 2005)

T.bag starts with the problem specification and a systemic model of the problem situation. From that a preliminary proposal for a specific process is derived, based upon the generic process model and using methods and tools from the toolbox (this is pre-rationalization). The proposed process can be modified according to new and changing insights and requirements any time, so that t.bag has the function of a communicative / reflective tool during the process. The final process can be documented and stored in a project archive for further evaluation and use (this is post-rationalization). The growing archive will feed the toolbox and generates new knowledge regarding the appropriate use of methods for the configuration of processes. Prototypical processes for certain situations may emerge, so that transferability of processes will be a longer-term effect of the use of t.bag (Chow and Jonas 2007).

The approach is made operable by applying a number of descriptive concepts: project dimensions, project domains, project constraints and process types, which are used for stepwise specification of a situation, which needs to be improved, i.e. for the definition of a problem-solving or innovation project.

- Project dimensions comprise:
  - *System:* scope of contextual factors to be considered: market, society, environment, etc. (degree of complexity),
  - *Research:* scientific standard to be considered (degree of scientific knowledge input),
  - *Future:* projective time space to be considered (degree of uncertainty), and
  - *Implementation:* executive opportunities (degree of realisation).
- Project domains describe the project focus and comprise:
  - *Technology,*
  - *Business / market,*
  - *Human values.*
- Project constraints specify further conditions and comprise:
  - *Schedule,*
  - *Budget,*
  - *Human resources, etc.*
- **Process types** are derived from the hypercyclic model / toolbox (Tab 2):

ANALYSIS				PROJECTION				SYNTHESIS				
												1 a "complete" design (research) process
												2 a futures studies process (without synthesis)
												3 a "normal" design process (without proper projection)
												4 a "risky" design process (not properly grounded in what IS)
												5 an analytic process (inquiry into "the true")
												6 a projective process (inquiry into "the ideal")
												7 a synthetic process (inquiry into "the real")

Tab 2 Rough categorization of innovation-, design and design research processes:.

Operationalization

The following describes the operational steps in more detail. They can be considered as a conversation between stakeholders, which tries to clarify the situation in order to design an appropriate initial process plan.

(1) Specify problem situation

- Identify the overall process by determining the values of the project dimensions
  - **System** dimension: high in this project, because of the specific complexity of the client´s system (employees, social aspects, market situation) and the uncertain contextual conditions.
  - **Research** dimension**:** low in this project, just existing knowledge.
  - **Future** dimension: short to medium terms (2-5 years).
  - **Implementation** dimension: low to medium, a concept / feasibility study, serving as a pool of ideas for the working prototype.
- Decide on the **project domain**

In this project: User values with a side glance at future business opportunities. Users are the end-users as well as the client´s employees.

- Specify **project constraints.**

This is a students´ project with emphasis on SYNTHESIS, tight timing, no budget.

(2) Match process patterns to specified situation

- Select **process type**

The determination of the project dimensions and project domains helps to select a process type, see fig. 3. This project would correspond to type 1: a "complete design (research) process".

- **Match** process patterns to the specified situation and process type.

Once a situation is specified in terms of dimensions, domains and constraints and the process type is selected, it can be matched to more detailed process patterns. Specific methods and tools to be used can be selected (Tab 3).

timeline	Week 1		Week 2	Week 3
Project phases	**ANALYSIS** mainly existing data	**PROJECTION** future images, contextual uncertainty	**SYNTHESIS** detailed concept of the PSS and exemplary realization of product proposals	
Methods used	Sensitivity modelling / analysis	scenario-building ("quattro stagioni"), essential in order to explore uncertain future contexts…	Business concepts Use-cases Prototyping User studies Quick&dirty concepts	
Project characteristics	- Design (user values) emphasis - Emphasis on usable concepts - Systemic emphasis, system model necessary as a basis for understanding the system´s dynamics and sensitivity,			

Tab 3: More detailed process pattern of the project, derived from the situation and the process type.

(3) Select specific methods /tools to be related to the process

Methods and tools are categorized by means of the underlying toolbox structure. In combination with the information available from the considerations above, i.e. the detailed process specification, it is possible to select appropriate methods for an optimal process. This is the link between the four levels of the approach as shown in fig. 1. The result is a preliminary project structure including the methods and tools to be used.

5. Process

The process consists of the 3 main steps of ANALYSIS, PROJECTION and SYNTHESIS according to the generic model. Analysis and projection have to be packed into 4 days, so that no further field research was possible. Because of the high systemic dimension of the situation it was decided to put the main emphasis on the system analysis and the exploration of uncertain (future) contexts. Both provide a kind of basis and guideline for the more detailed design efforts in the synthesis phase.

Starting point is the well-known interface concept of designing as put forward by (Alexander 1964) or (Simon 1969, 3rd ed. 1996): design creates the fit / the interface between the inner system (the artefact) and the outer system (the uncertain context). The inner system is the PSS to be designed, the outer system is the social / market / urban context in which the service has to be viable. This is also comparable to the logic of SWOT analysis: matching the strengths and weaknesses of the system with the opportunities and threats of the environment.

ANALYSIS and PROJECTION

Sensitivity analysis (Vester 1999) creates a systemic model of the situation by building an effect system out of the relevant factors determining the situation.

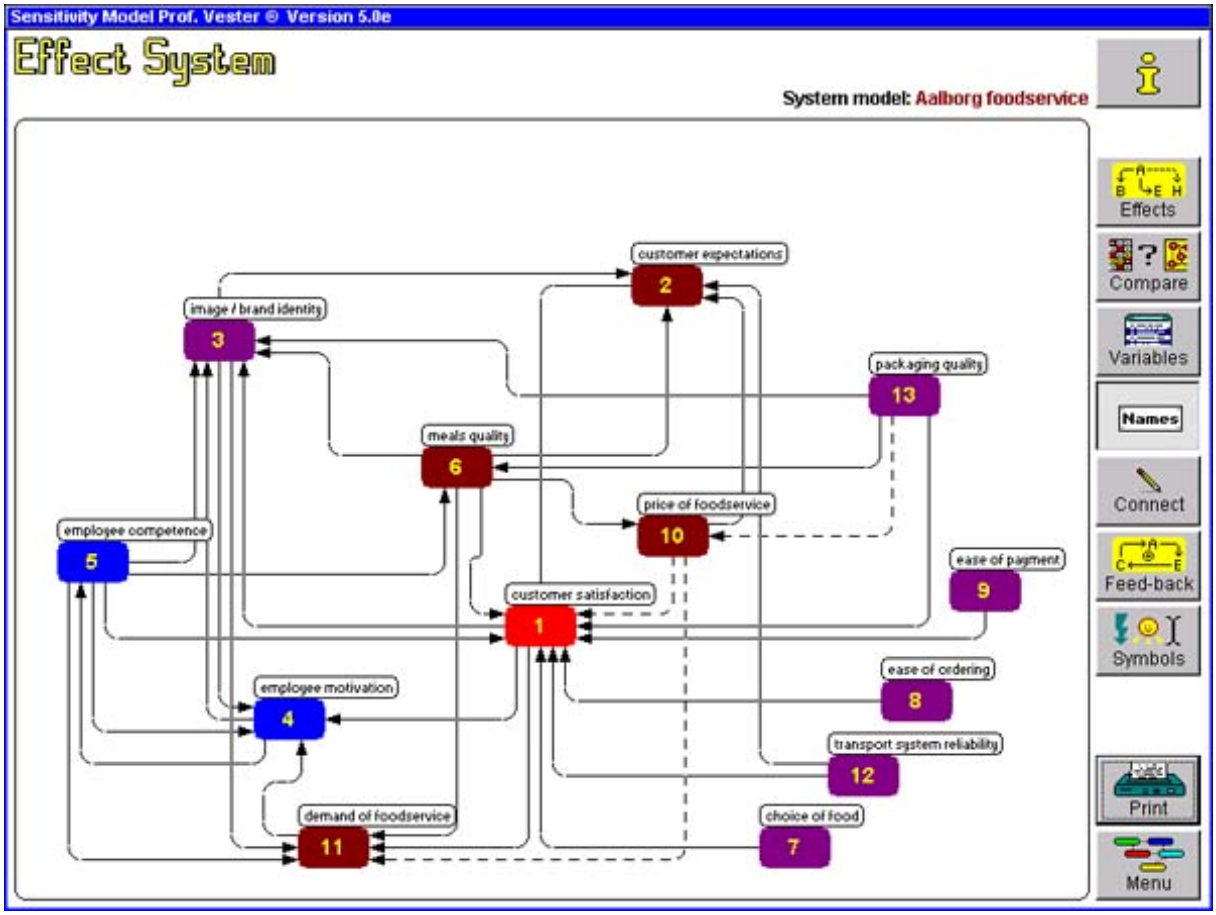

Fig. 1: Effect system of the meal delivery service

By means of cross-impact analysis it is possible to gain valuable insight regarding the systemic roles of the variables:

- - active factors (e.g. 5 employee competence, 13 packaging quality, etc.) have a strong impact on the rest of the system and may be used as levers for intervention,
- - reactive factors (e.g. 1 customer satisfaction, 3 image / brand identity, etc.) serve as indicators showing the state of the system, they are normally not useful for direct interventions,
- - critical factors (e.g. 4 employee motivation, 1 customer satisfaction, etc.) have high influence on the rest of the system and are – at the same time – influenced by the system, they have to be handled with much care,
- - neutral (e.g. 10 price of foodservice) and **buffering** (e.g. 13 packaging quality) factors contribute to the self-regulation and stabilization of the system.

Sensitivity modelling is not a solution machine but serves as a communication platform structuring the debate among stakeholders and contributing to a common understanding of the situation and its dynamics. And, of course, this contributes to structure and purpose-ortientation of the further process: **Motivation of the employees**, **customer satisfaction** and **reliability** of the service turn out to be essential for the system.

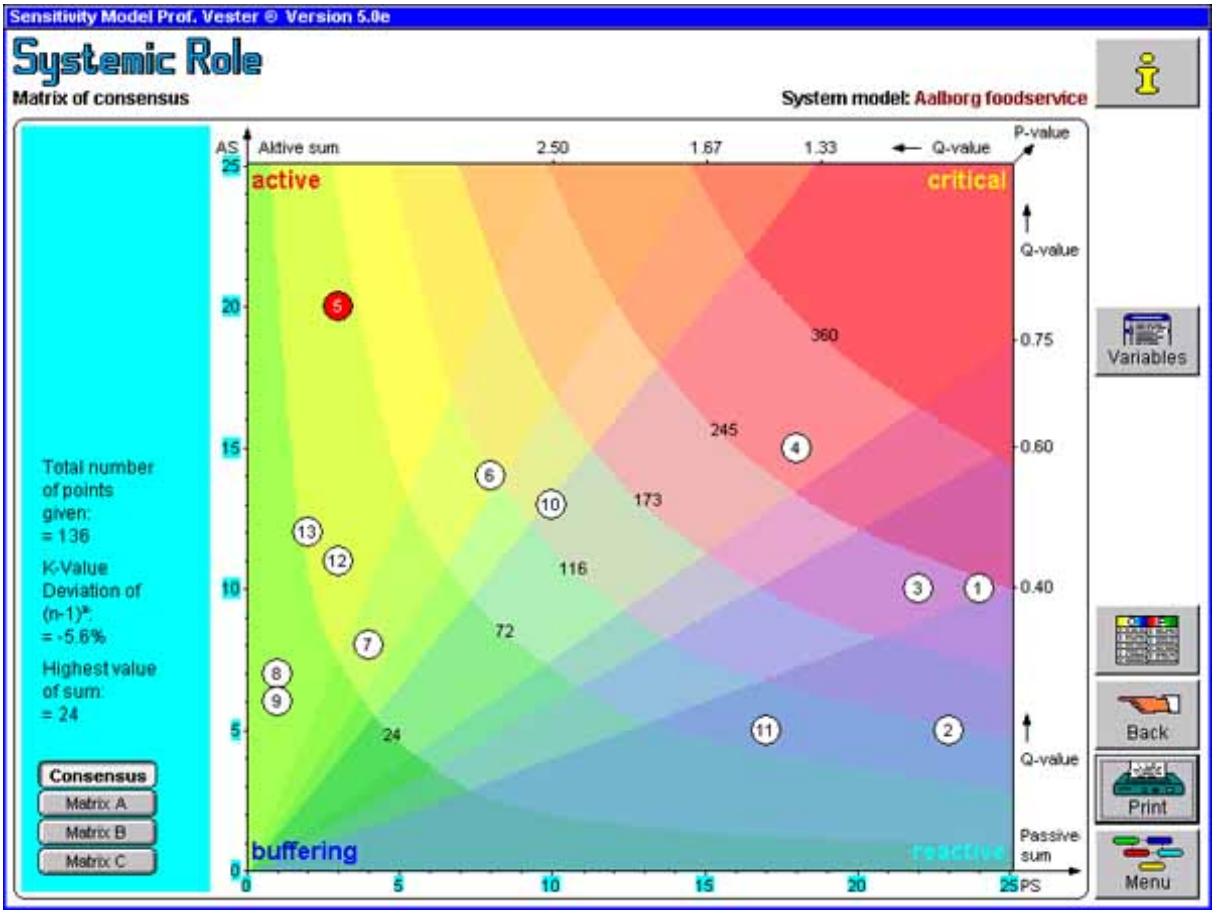

Fig. 2: Systemic roles of factors of the meal delivery

Another essential outcome of ANALYSIS is the definition of activity / solution modules for the foodservice: **logistics, delivery, payment, marketing / PR, and bike maintenance**.

PROJECTION

Projection normally deals with possible future states of the system´s environment and the viability of solutions with respect to these conditions. Here it is not so much the future state but the present situation of customers´ demands in the local context that is unclear. So we have to ask: what are the external uncertainties that influence success or failure of the service?

We use the scenario approach "quattro stagioni" (Schwartz 1991) to describe 4 extreme contextual states. The main purpose of this step is to make possible future contexts explicit. Increased awareness of future uncertainty contributes to the transferability of solutions into new contexts. With reference to the debates in the ANALYSIS phase we decide to use the dimensions:

- - time flexibility of customers (fast food – slow food)
- - food preference of customers (simple food – complex food)

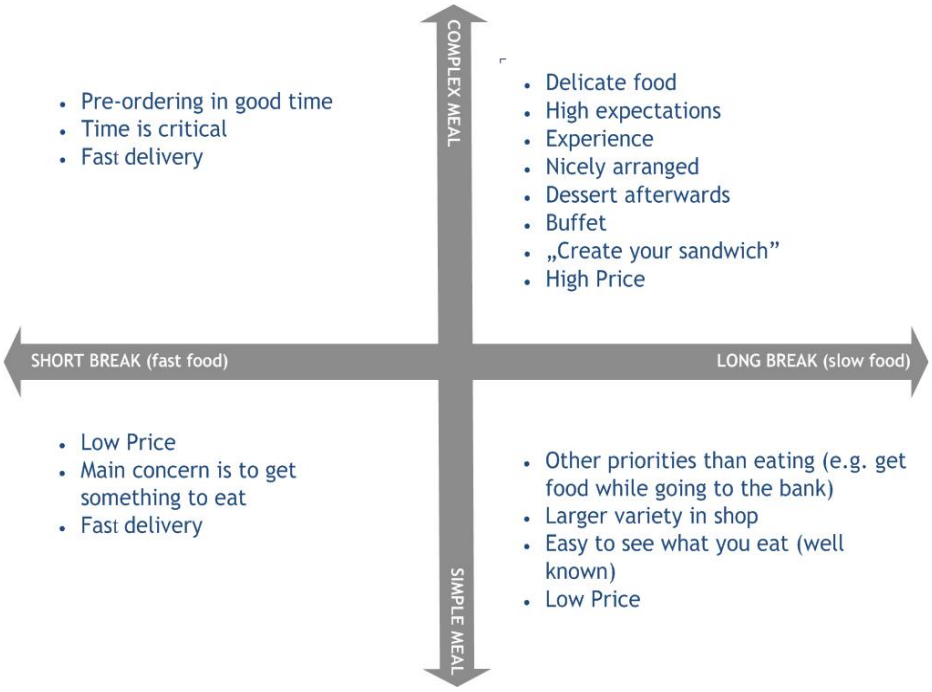

Fig. 3: "Quattro stagioni", 4 different scenarios for the service

In a final step we try to match the activity / solution modules to the scenarios:

- - If we are uncertain about the future context, then we should aim at a robust strategy, which is usable in different contexts (a horizontal row, explorative scenario approach).
- - If we are certain about the future context, or if we are determined to be successful in the chosen scenario by all means, then we should aim at specific / taylored strategies aiming at the desired state (a vertical column, normative scenario approach).

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Logistics				
Delivery				
Payment				
Marketing / PR				
Bike mainten.				

Tab 4 Strategy development for the activity fields related to the scenarios (Jonas 2000; Jonas 2003; Jonas 2005).

SYNTHESIS

The systesis consists in the development of the four scenarios outlined above into details.

Each scenario defines a business concept on the basis of the most critical factors identified in the "4 stagioni" method and in the sensitivity analysis (Fig. 4).

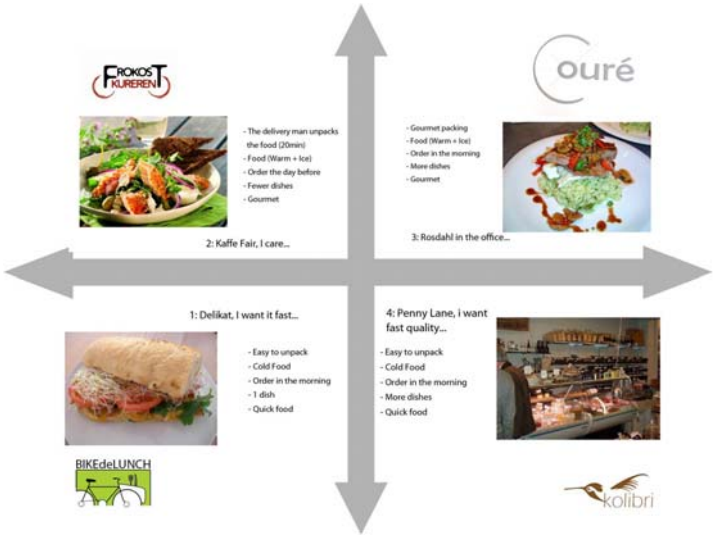

Fig. 4: Overview of the four concepts deriving from the 4 stagioni method

Requirements

Each concept, identified with a name, defines a platform of actors, interaction, information and business flows that needs to be defined in details. The requirements are therefore organised on the basis of the 5 activities fields described in Tab 4:

Logistic aspects depend on bicycle transportation and customers' expectation about delivery time. Those aspects concern the identification of a *served* area, a number of food providers that can be associated to each concept, number and efficiency of the couriers (the project does not assume the courier to be in perfect shape every day)

Delivery aspects include ordering time, food choice (more variety can affect delivering time) and the collection of food from local shops or restaurants

Payment-related aspects: delivering people should not have the responsibility to collect the payment, this has several implications on the organisation of the payment system.

Marketing/PR: delivering people are not specialised in this service, and in some case they have problems in their social relation with other people. This requires more attention on strategies to address customers' expectations and on the interaction between customers and delivery people.

Bike Maintenance: The service has its own bike repair workshop, that should also able to provide assistance in case of emergency.

Concept development tools

A progressive definition and detailing of the service, starting from the broader frame outlined in the "4 stagioni" method, is organised in order to address different design aspects:

- The development of a modular architecture for the service
- The analysis and design of time-related aspects
- The organisation of an efficient system configuration on the basis of a high variation of individual choices; and
- The organisation and design of infrastructural elements of the system

A modular architecture

Being based on bicycle transportation, the service must cover a limited area of the city centre and use only local resources (food providers, restaurants). The methodological approach

used for the organisation of local activities and the exploitation of local potential is based on a modular architecture, in which each module refers to an autonomous actor. Each actor holds the knowledge needed for providing a part of the service. The main organisational task is to generate a *solution platform* that allows multiple solutions, by specifying sequence of events, interaction among modules, physical and financial flows.

Those platforms allow for a distribution of *engineering power* among the modules of the platform. Each module will be appropriately designed and organised at the local level (e.g. each food provider will autonomously decide upon its offering), while the system organiser will negotiate the connection of those modules through an appropriate modelling activity that simulates the behaviour of the system in time and space. The system organiser should also propose elements essential elements for the coordination of the activities , such as time planners, bicycle transportation, a web page for ordering and daily menus.

According to this methodological approach the first stage of the project consists on the identification of the actors (food providers, service providers and customers) on the basis of their geographical location.

Addressing time-related instances

Likewise architectural design, the concept development process can start from larger scales (platforms) and, in a second phase, be articulated into details (products and interactions)

Unlike architectural design, though, the definition of the details in service design cannot be based on synchronic representation, because of the critical relevance of time sequences and events in phases such as logistic and delivery. The whole system should be organised around a very short “time window” for delivery: lunchtime.

An event based method, such as use cases, can effectively address time-related instances of the service. Use cases are used in service design to specify the sequence of events in a service (Morelli 2002). Each use case represents a simple instance of the service and focuses on a specific actor (the courier, the customer, the IT unit). The time sequence specifies each phase of the service, elicits requirements concerning the actor’s experience (front office) and the system behaviour (back office), finally, use cases facilitate the coordination between individual time plans.

Planning variation of individual choices

The focus on highly individualised solutions requires that different scenarios be defined, that address individual choices. The scenarios consider different actors’ behaviour, different organisational instances and emphasise their implications on the system.

Scenarios are particularly relevant in the organisation of meal ordering. Individual preferences could be combined (thus creating cumulative orders from people working in the same building, or people with the same dietary requirements) and with organisational instances (e.g. the availability of meals or food providers that satisfy that choice). By grouping those instances, different ordering scenarios can be adequately addressed, that improve the efficiency of the service.

Planning the infrastructure

Use cases and scenarios bring the development process to a level of definition that is adequate for the specification of the material tools and the technological elements that will support the service.

In this case the service is not supposed to introduce any particular innovation at the product level: bicycles, communication tools and personal equipment are off-the shelf products;

minor adaptations are required (e.g. bicycles, packaging, invoice system), to facilitate delivery logistic and payment-related requirements.

Outcomes

The design process brought about four detailed concepts for the “Frokost kureren” service proposed by FF. In fact frequent meeting with FF personnel made it possible for this organisation to be an active part in the development process. Although some of the concepts proposed were not perfectly adequate to this specific initiative the four framework concepts were useful for the company to focus on the problems and develop new solutions.

The focus on the problem site emphasised issues related to:

- an adequate time plan to organise the logistic-delivery system, with particular focus on critical phases, in which several functions are overlapping;
- different demand patterns;
- an adequate coordination of the offering from different meal providers
- a marketing and communication strategy consistent with the effective capabilities of FF personnel
- By focusing on the solution space FF was able to:
- Identify an approach to coordinate time related instances in the logistic and delivery system (e.g. use cases and scenarios)
- Identify different solution frameworks to address different demand patterns (i.e. different ordering or membership scenarios)
- Identify the elements that would support the interaction between different actors (e.g. booking systems, online menus)
- Define an adequate qualitative level for the service according to the available resources (PR, service identity, interaction between customers and service).

After the workshop the service was started for a test period. FF chose to work on a mixed concept, considering a limited number of meal providers for customers with long break (a scenario similar to the lower right quadrant of the 4 stagioni method). The service is still in the test phase because of the difficulty for the personnel to guarantee an adequate level of service.

6. Conclusions

The research questions addressed the issues of

codification / transferability: whether is possible to generate anything similar to a source code for this kind of initiatives and what form for the source code; and

differences / similarities of business- and social processes: whether criteria and procedure for designing services in a socially oriented context are different from market oriented services

Transferability of the approach

The relevance of this project in the debate on design research lies not only on the design process for this specific solution, but also in the definition of strategies to “codify” the design process, in order to transfer elements and procedures to further projects in different contexts. This paper proposes the question of transferability both on the problem space and on the solution space, thus proposing a methodology for handling the problem and an approach to structure the solution:

- The methodology / methods toolbox as described and applied above provides a framework and guideline to deal systematically with highly contextualized design situations. In spite of the situatedness of every new problem t.bag contributes to the collection and refinement of prototypical process patterns.
- The articulation of the solution into an architecture composed by modular elements creates a platform for different combinations that can provide highly individualised PSSs.

Business design processes vs. social design processes

When working on local projects, socially oriented design processes and business processes are both focusing on contextual conditions; in this sense the difference between the two approaches is minimal. In both cases, the processes introduce conditions that are “external” to the design activities, and do not bring about fundamental changes in the design process, although they do imply a different approach. Designers will need to abandon traditional top-down and business centred approaches and increase their sensitivity for social contexts. The design team should individuate a network of local actors that will co-develop the solutions.

Designers, with their methodological approach to innovation and their aesthetic expertise will keep their role as change-agent even in local and highly individualised solutions, but the “symmetry of ignorance” requires a modest attitude for designers, in order to withdraw from the previous control position and become a moderator in the innovation process.

By focusing on mechanisms of activation of local social and business resources, this project points out at the big opportunity for innovation in design activities. Whether coming from business or socially oriented processes, such innovation changes the perceived role of designers in the development process, though it does not change his/her level of responsibility for their action.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Contribution of Design to EU Projects and Programs in Italy

An experience on the use of a "design-oriented approach" in an EQUAL project. Compared outputs.

Manuela Morra[1], Antonio Ilic Vitolo[2]

Abstract

This research buds from the experience of Altronde, a team made up of two professional "service designers" aiming at using design tools (especially service design) as a strategic, methodological and creative contribute to the development of welfare initiatives oriented toward social and environmental sustainability.

This paper aims at presenting our point of view: we believe that design is a significant contribution within EU projects and programs. It can facilitate the methodological and creative process, giving a support during the needs analysis and the project's outputs orientation.

This paper contribute to define how design can work into an EU project or program and how it can interface with stakeholders and their traditional approach.

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1 Introduction

This research aims at introducing guidelines useful to understand how design and creativity oriented competencies can be helpful to project processes relative to European programs and calls, oriented to welfare and local development.

The suggestions are the result of our professional experience as service designers participating to Equal project “Palcoscenico”.

The paper consists in three main parts: the first one shows the context, namely the EU programs and the project we worked on. The second part deals with the most relevant contributions that, according to our own experience, designer can provide to EU projects. In the third one we identified the most critical factors in achieving a “design oriented” approach. The last part gives some suggestions to both designers to understand how to face such a context and to the stakeholders to realize which are the main advantages of such a creative approach.

2 The context

2.1 EU projects in Italy

Since 1957, through the ESF (European Social Fund), the European Union has been financing projects helping citizens improve their own competences and increase their working opportunities: occupation is the first mean through which EU grants prosperity and welfare to Europe and its citizens.

EU projects aim at reducing the differences among European regions and among member states as regards life quality and prosperity. Therefore, they are useful to support social and economic cohesion by creating a larger and high quality occupation and by giving citizens the opportunity to develop the necessary competences. (Equalitalia, Portal of the Community initiative EQUAL).

European Social Funds are available by presenting operative programs created by the partnership of different organizations. Operative programs establish the ESF action priorities and the objectives for a period of seven years (i.e. 2007-13).

Projects need to be focused on general targets and be characterized by a high quality level resulting from the idea, which should be good and properly organized, and the partnership, who should grant highly qualified stakeholders.

As to the period 2000-2006, the main objectives were:

- to promote development and structural adaptation of weak regions: Campania, Calabria, Puglia,Sardegna, Basilicata e Sicilia
- to support districts with structural difficulties in order to reconvert them economically and socially.
- to develop new professional training systems in the fields of education, training and occupation.

In particular, five sectors were considered as priorities:

- The development of occupational policies
- The promotion of equal opportunities in acceding to labour market;
- The promotion and improvement of professional training and education
- The promotion of qualified workforce, of innovation in work organization.
- The realization of specific actions aiming at improving women’s access and participation to labour market. (Equalitalia, Portal of the Community initiative EQUAL).

A note about project partnership.

European funds are distributed at communitarian, national and regional level. Most of them are distributed through calls, mainly addressed to project partnership, namely groups of public and/or private actors.

These programs are enacted by several typologies of organizations, such as national authorities, education and training organizations, ONG and voluntary associations, social actors, etc. Partnerships generally identify a lead partner and distribute the roles.

Considering the high number of participating people, the management system is very complex. The organization phase is often the most critical for the Italian partnerships: it requires great part of the resources to the detriment of outcomes quality.

2.2 EQUAL projects

As an ESF community initiative, Equal is a platform aiming at finding new ways to reach European strategy objectives of occupation and social inclusion.

The role of Equal projects is to generate meaningful changes in specific problems to be solved, through an investment in terms of innovation and experimentation. Equal actions can and must experiment with new ways, tools and methodologies which have to be more effective and face people's and organization's problems in specific areas and topics. (Equalitalia, the Portal of the Community initiative EQUAL).

What makes the initiative different from the main ESF programs is the fact that it provides examples of best practices in terms of innovative approaches. It also pays great attention to active cooperation between members states, in order to grant the sharing and diffusion of the outcomes all over Europe. Therefore, projects have to include activities which are necessary to spread and apply what has already been tested.

Projects are realized in a period of 2-3 years and consist of 3 actions:

- Action 1: Setting up of the Development Partnerships and of a transnational co-operation
- Action 2: Implementation of the work programmes by the Development Partnerships
- Action 3: Thematic networking, dissemination of good practices and impact on national policy. (Equalitalia, the Portal of the Community initiative EQUAL).

A critical note on Equal projects efficacy in Italy

Some critical points about output typology and Equal outcomes have emerged from the 2005 Equal national report. Equal programs seem to operate as reinforcement/substitution of ordinary actions, rather than as an innovative way to develop them.

Equal programs have a high number of addresses, but not for long treatments.

There is a great difference between the number of the addresses involved in the encouragement actions and the ones involved in structured and direct actions. From the 77 Development Partnerships' final reports it emerges that 2440 people per DP have been involved in informational and promotional actions, while only 349 people have been involved in motivational actions. The numbers lowers in more structured actions 75 (training and services to direct users). (Ismeri Europa 2005)

This report shows the tendency to develop supporting offers (informational and cultural), rather than to give direct answers to the needs, in spite of Equal trend to emphasize experimentations and actions directed to final users.

2.3 Palcoscenico project

Palcoscenico is the project we have been involved in as consultants.

P.A.L.CO.S.C.& N.I.CO. is an acronym for "Piano di Azioni Locali per la Costruzione di

una Sensibilità Collettiva e una Nuova Identità della Conciliazione" which means "Local Actions Plan for the Creation of a Common Sensibility and a New Identity of Work-life balance".
Its main purpose is to realize initiatives and services aiming at reducing working time or organizing it in a different way, and also at setting it free through measures supporting the balance of working time and personal life.

Another purpose is to spread out a new idea of work-life balance as something referred not only to women, but to everyone.

The institution client is Regione Campania and the DP is made up of Provincia di Napoli (lead partner), Comune di Napoli, ARCI Napoli, D&S Group cooperative and OBR, the Bilateral organization for professional training in Campania.

The objectives are achieved through three main actions:

- A communicational action plan regarding the entire district of Naples, through a differentiate and integrated use of mass-media, in order to involve both local actors and citizens.
- An Agency for the Work-life balance to realize work-life balance services and initiatives.
- An experimentation action in five areas of Neapolitan district where to activate initiatives involving directly local administrators. The action includes a needs analysis and the suggestion of intervention models. In one of the areas the project managed to activate an action for the creation of a work-life balance service. (Equi-Palcoscenico, Palcoscenico project web site) .

2.4 Who we are: Altronde

Through "strategic design" and "service design" methodologies, Altronde offers consultations to firms, and public administrations to find and develop solutions and services characterized by a highly innovative content and a "sustainable" orientation to the purpose of producing benefit for life quality and environment.

Altronde transfers part of the designer's competences – already present in the productive and industrial fields – to strategic sectors in order to create actions referred to welfare politics. Creativity, vision, design method and management of complexity: if focused on solving a problem, they all are effective in creating satisfactory solutions for a specific welfare request in a specific context.

Altronde deals with increasing the value of bottom-up solutions, which are models to be repeated in several contexts, if properly interpreted and re-designed.

Our goal is to create effective and user-oriented services as part of the answer to a problematic context. Services are meant as pleasant experiences where the user plays an active role. They also represent a chance to inspire responsible behaviours and social fabric regeneration processes.

Our designed services materialize through new lifestyles or new ways to solve daily problems: elderly and children care, management of urban green, house maintenance, new mobility systems, food networks, etc.

2.5 Altronde's part in Palcoscenico

Altronde's partners participated to Palcoscenico project as consultant.
Firstly we had to support the design of services within the IV Municipal Corporation of Naples, where the Partnership aimed at supporting local administrators in designing and activating a service for children care. Then we were asked to design the PALC (local action plans for the Work-life balance), namely documents proposing intervention models in terms of services to citizens and workers, on the base of a needs analysis.

We have probably been involved in the project because, in the light of a previous experience (Equilibra), the Partnership felt the necessity of designing concrete actions of Work-life balance, in the form of services to the citizenry.So, Altronde's initial role was to address project outputs to citizens and final users solving some of their direct needs.

In particular, we cooperated with two of the project group partners: the Social Cooperative "Donne e Sviluppo" and OBR, the Bilateral organization for professional training in Campania. With the first one, our task was to analyse and design concepts for the Vesuvian area. With the last one, and the Group "Piccola Industria di Napoli", our task was to analyse and realize projects for the IV Municipal Corporation of Naples.

1 Analysis of the contribution of design in the EU welfare projects

3.1 The critical definition of the project specific target

The most important elements that design can improve concern the targets of the project and the shape of the outputs.

The design typical creativity, related to complex projects, can be useful to help give appropriate shapes to the solutions, so that these ones can fit in the reference context, according to the available resources.This is a skill that less creative expertises aren't inclined to deepen: as shown in the report above, the trend is to propose easily manageable indirect solutions, based on either communication or training actions or governance models .

This kind of output is acceptable considering the competences or the skills of expertises generally involved in EU programmes. These expertises do not have the tools to develop citizen-oriented solutions.

When we started devoting ourselves to the project, as service designers, we thought that the project was mainly aiming at establishing services for community benefit, work-life balance. We also thought that the resources of the funds could cover also activation fee.

Actually we discovered that project, only in its experimental part, took into account the development of solutions aimed at the final users. Besides the economical contribution was provided only for the planning part.

Our expectation about the project output, was in opposition to an approach, directed to the formulation of planning and governance tools (Local Action Plans of work-life balance) and to the supply of informations and consulting services (agencies of work-life balance).

Later on we had to lead our efforts from a feasibility planning (activated for only one territory) towards a design of intervention models, intended as ideas to be developed in specific local contexts.

The proposed actions (PALC and agreement protocols) have been therefore addressed mainly to institutional agencies (Local Authority) rather than to companies and citizens, thus extending the planning chain and the times.

It has therefore been considered appropriate, to privilege actions aiming at the awareness and diffusion on the territory of a culture of the work-life balance, through a communication plan:

"all the time you want".Such an action was developed to stimulate awareness on work-life balance issues.

Other EQUAL projects, realized in other contexts, led to the real experimentation of services in support of the family. Such services have been addressed to the weakest people in the families, such as as: the eldest /youngest/disabled people. Other services are instead directed to the conciliatory needs of the employees. This initiatives have integrated pre-existing services, creating new work opportunities, especially for women. By offering family-friendly services it has been provided an innovative response to the existing and real family needs. Among the good practices it is worth noticing the service activated by the Municipality of Perugia, which puts into practice the service design approach.

The Babysì service was intended to create an association of mothers and baby-sitters that manages care services addressed to 6-months-old to 10-year-old children. The service links the present initiatives in the territory by promoting the regularization of employment in this field. The model succeeded and was added by the Region Umbria in the draft "three-year plan of the system integrated of social and educational services for the early childhood 2008-2011". (Territori concilianti 2008*)*

One of the difficult aspects was that the project was affected by financing, laws on which the solutions should have been based. The problem related to this approach is that the project will offer "prepackaged" and generally incomplete solutions, which are not suitable to the context.

Therefore, a well planned design chain, which is intended to tackle beneficiaries' real and concrete problems, must start from a complete and accurate analysis of the existing situation. The solutions that are able to cope with the problems must be created subsequently.

Design may be a tool to optimize the planning chain.

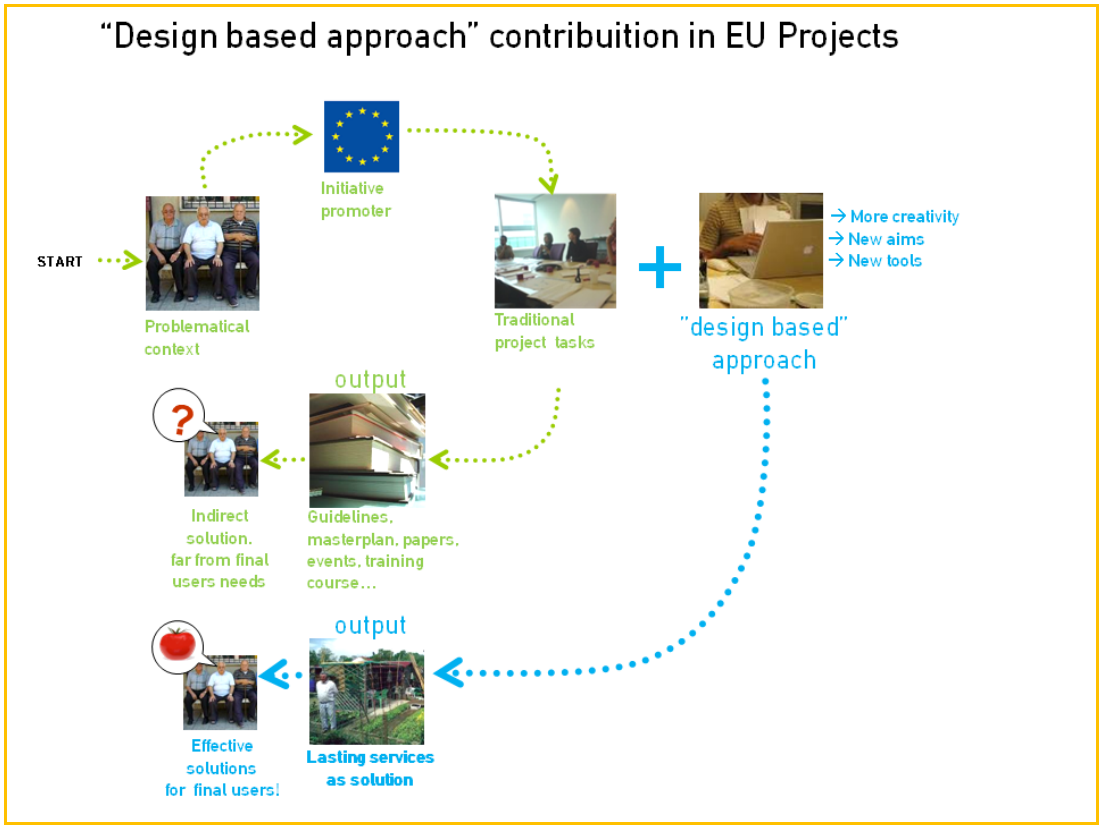

Fig. 1: "Design based approach" contribution in EU Projects

	Development Partnership vision	Designer vision (Altronde)

Main objectives	- design governance model - make informative front office and initiative - make a “guide” to help local administrator to build services	**build services for citizens to improve work-life balance.**

Table 1: Comparison table, Palcoscenico project objectives

Defining methodology and work tools

A strategic factor of design that can be crucial in EU projects is definitely the methodology, namely how to deal with the working activities and what tools use to achieve the goals.

To tackle our tasks we have focused on the effectiveness by creating a path, and some tools which would let us achieve the goals. To identify the work-life balance needs the development partnership had established an articulate path consisting in "territorial forums" and "focus group".

- “Territorial forums” were a series of meetings with groups of local administrators, who should have clarified what the issues, the items of intervention and resources were.
- “Focus groups” instead should have been meetings attended by representative of the partnership and the third sector actors to decide the intervention plans.

These instruments have shown little effectiveness; in fact it has been difficult to organize meetings, which could be involving for a sufficient number of people to take significant decisions.

Another problem was related to the results of these actions; in fact they were effective till they dealt with the general level of the topic.

Also for the actions of context and work-life balance mapping, the reference actor had developed a form of approximately 120 questions that the Provincia di Napoli should have sent to all the local assessorships and competence offices. Obviously, not even one filled-in questionnaire has been handed back. It is likely that the questionnaires have not even been delivered to the city council.

For the planning of actions and services, Altronde has developed a path divided in three main stages:

- Territorial analysis: providing a full overview of the characteristics of the territory, of the needs of their respective catchment areas and their quantification. The methodology used in the context analysis phase has concerned a first research realized through the web (macro-analysis) and a more detailed deepened (in-depth) investigation based on interviews and comparisons with reference actors (institutional representative) and people who work or live in the territories.
  Output of general analysis phase has product some synthetic mappings which were showing:
  - critical and promising factors recorded in the territories
  - context mapping (services, associative realities, …)
  - general map of the problems expressed by the interviewees
  - general map of the promising factors
  - general map of the proposals

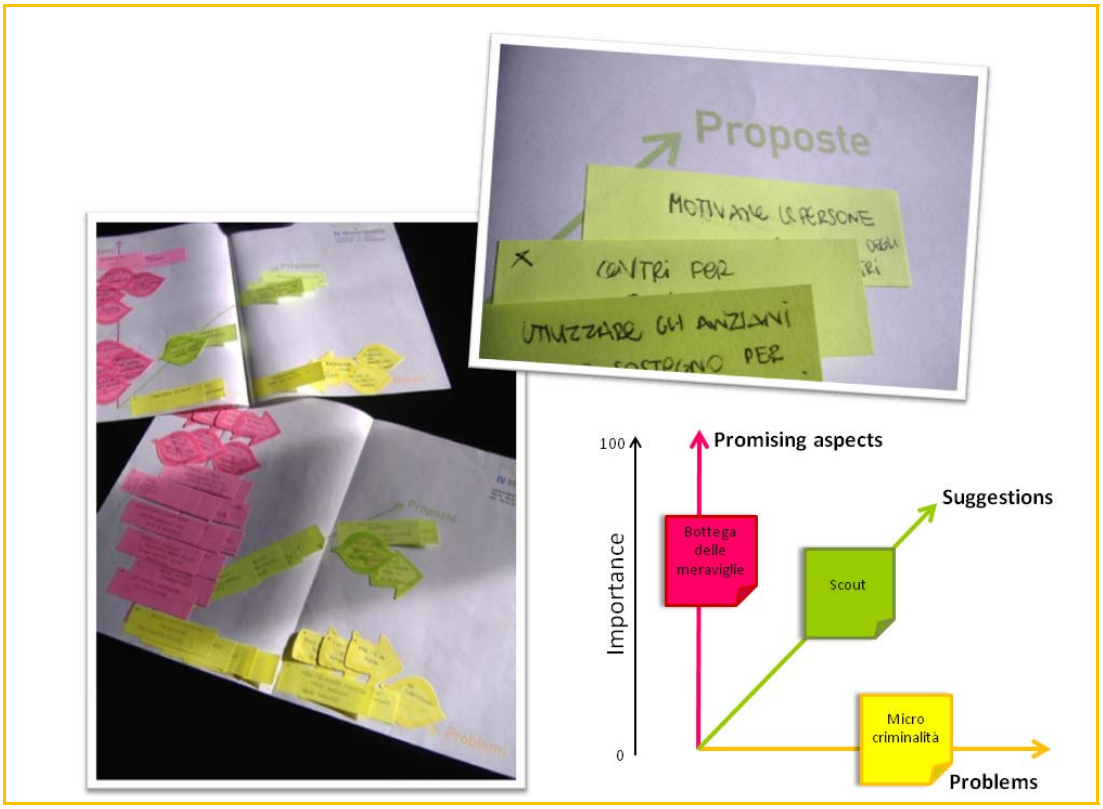

Fig 2: **Problems / Promising aspects / Suggestion Map**. We designed a viewing information system for the dialogue/survey with the reference actors (qualitative analysis).

- Research on the themes of work-life balance and analysis of case-studies: a research has been started to find what the visions on work-life balance were and how they adapted to to the Italian society. The collection of case studies, characterized by innovation, was instrumental to gain new knowledge and know-how both from the successful and unsuccessful cases.
- Designing phase: design inputs have been identified leading to the formulation of the various "operational models" related to the different territorial contexts. By operational models we mean service ideas describing in a synthetic way the service being offered and the needs it was addressing, the interaction system with the user, and an organizational chart showing the stakeholders map.

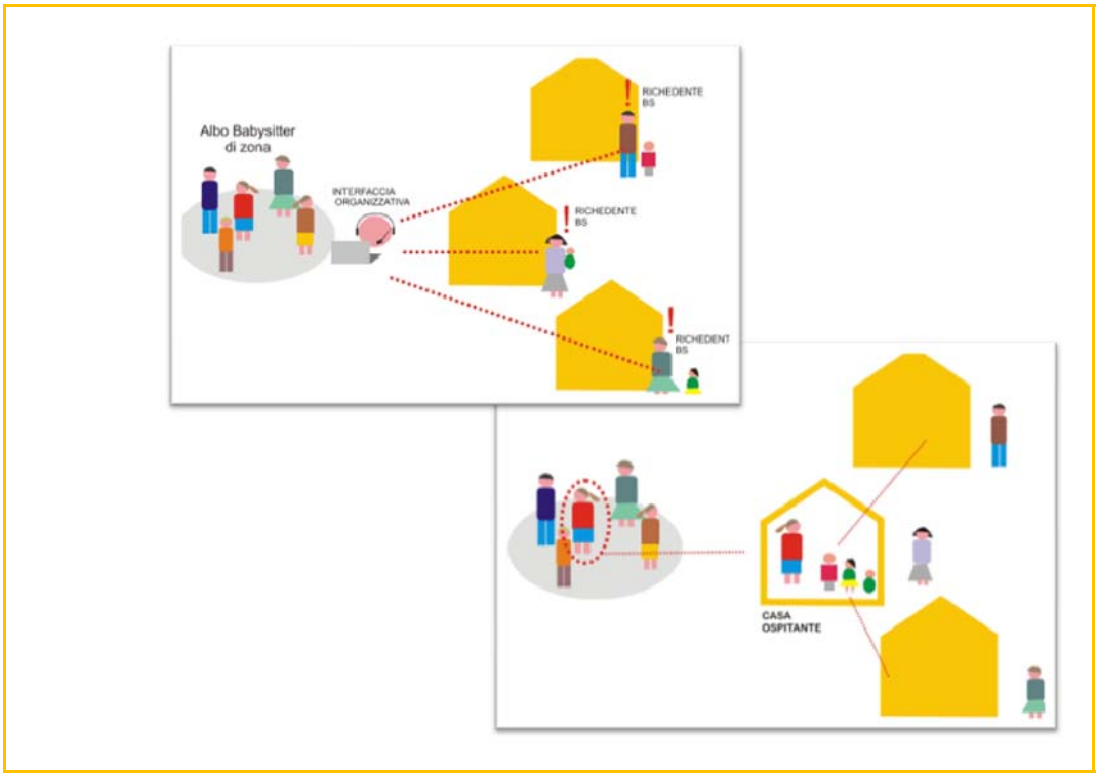

Fig 3: **A Service Map**. The concepts are displaying through "service maps" that identify the fundamental aspects in a graphic, simple way: role of the actors, interactions between users, material and immaterial elements, resources, places,....

- Guidelines: for each phase we built some tools (mostly maps) which supported the collection and management of information and also to share with the other actors of the project. We always tried to facilitate the tasks of the other actors by submitting collaboration requests easy to fulfill (limiting the transfers, the necessary time and within the range of their expertise).

	Development Partnership	Designer (Altronde)
Tool	Focus group: meeting with group of local administrator and stakeholder.	**Personal interview** organized on 3 topic : problems, promising aspects and proposal.
Efficacy	The organization and management was very difficult. The actors presences was insufficient. Generally discussion turn from original goals.	Great number of interviewed people. Accurate information functional to project development.

Table 2: Comparison table, Palcoscenico work's tools for work-life balance needs analysis

Communication and simplification of language for a shared vision of the project.

If a citizen was asked to read a project of an EU program, he probably wouldn't go further than the tenth page. However he would already be confused. This happens because the world connected to this type of planning often seems fond to a complex aesthetics.

Simple things – very often the most effective – are often distrusted. It seems that creating difficult logical-conceptual processes is necessary to give dignity to the work. Of course, this approach influences the communication of the project which is a complex system in itself because of the amount of actors.

Another factor to consider is time that often actors of the project lack of because they are generally very busy. Not all of them manage to read the whole material or comprehend it completely. At worst they give a different interpretation from the author's one.

An effective visualization involves also the characteristics of concreteness and tension toward the outputs. A visual map of the logical path followed by the designer to reach the final result makes clear and facilitates the creation of common ground that is the first step towards the "common vision of the project ".

To make each work stage more effective we elaborated it as a presentation. This way, we are forced to consider its communicative value as a fundamental aspect.

This process helped us designers simplify and summarize the results from time to time, focusing on the final goal and not on the single stage. The presentations helped the other actors read the work, which, through the synthetic text combined with images, encouraged the reading and the faster perception of the salient points.

	Development Partnership	Designer (Altronde)
Tool	**Typical report** The accountable actor planned a document in which must be present an introductive part on territories and a second part with the list of initiatives and services functional to work-life balance	**Contest presentation+mapping system** A presentation with a large use of images and catch phrases summarizing complex information . We designed territorial mapping system. Maps supplies typology of information with geographic references too.
Efficacy	Report was developed in a didactic way. It result very hard have a brief vision of the contents.	Main information was suddenly clear trough the mapping system.

Table 3: Comparison table, activities for communicating territorial analysis results

The involvement and playfulness in the project activities

We developed some work phases through methods involving all the participants: the planning team members or interviewees. We also chose a light and funny approach.

It is possible to lighten the mood, especially in group activities, through two levers: the language and the tools.

The language: it is important to use a "light tone", which must suit to all the activities and the communicative artifacts. The lightness stands in language simplification and in the pleasantness of discussion experiences.

Realizing a simple and clear introductory speech to submit to an interviewee, providing him with material on the project and editing its graphics: all these elements can be simple actions that may encourage interaction with other actors. The use of both titles and funny and unusual images delights who is listening.

The tools: when the way to reach the goals must be defined, it's highly productive to develop work tools stimulating the involvement.

The involvement is useful both at a higher level (the methodological one) in which the identification of participation activities take place, and at a more practical level, namely in all the discussion actions (whatever the referent) in which it is always useful to set up the activities in an interactive way.

We tried to develop interactive tools aiming at stimulating the discussion and the contribution of everybody. For example, in our presentations, we used address specific questions to the present people in order to stimulate their participation in decision-making.

	Development Partnership	Designer (Altronde)
Tool	Multiple Form: a tool to conduct a census about work-life balance activities and initiatives. It is e-document send by e-mail to local administrator offices. To compile the form was necessary to mark voices among about 200 boxes	Answer tab: We used colored "post-it" to mark (in real time) the answer on a visual map divided by 3 axes: problems / promising aspects / suggestions.
Efficacy	The document doesn't introduce in a appropriate way the project. The used language was hard and burocratic. The reader perceived the form as promissory to fill out.	We introduced personally the project Palcoscenico. The interviewed people resulted involved and intrigued by colored post-it on the tab. Viewing in real time their answers people gave a correct vision. Often interviewee required news about project development and local analysis.

Table 4: Comparison table, tool to obtain information on the interviewee's territorial context

3 Critical factors to design and designers

The following chapter deals with the most difficult points to cope with when adopting a designer approach and the obstacles to the work of creative figures within traditional working teams.

3.1 Project language dimension

We believe that within project activities, a design oriented approach needs the presence of creative professional figures. However, very often they lack in relevant training or experiences in this field. So we believe that one of the main obstacles to a design-oriented approach is the kind of language used by the traditional actors of the world of European projects.

The vocabulary used in the project activities documents are often neologisms defining typologies of solutions or tools to use within the project.

This kind of micro language is likely to be better understood by actors dealing with welfare and local development than by the ones who do not posses these competences or do not know

the internal dynamics of a project. In this case creative figures could feel disoriented in consulting the project documents.

We ourselves needed a long time to really understand the various aspects of the project and the true meaning of some activities we were hearing of.

3.2 Managing politic and interactive dynamics

Design is a cultural mean which affects output quality, whatever the field it is applied to.

Within the management system of a project, the higher is the position of the design, the most its potentialities will increase.

In a project like Palcoscenico, the designer can provide his support in designing and realizing a simple presentation trying to improve its quality and making it more communicative and effective.

However, at the same time, the contribution of designer can be more incisive by focusing on the goals and the means to reach them and by providing a new point of view based on creativity. This quality should make a difference between the designer and the other members of the team.

The designer can also offer a critical and innovative view of the project, thus providing the members and actors of the partnership with some things to ponder.

Naturally, it's up the project managers to define the role of design and of the creative figures. Instead, the designer must be able to manage his competencies in such a complex context, to understand the interactive dynamics and to find the place to express his own opinions and ideas.

The actors leading the management of EU projects are generally numerous. In a group, each one has his/her own point of view: this generates contrasts due to technical discussion and many other reasons, such as temperamental incompatibility.

Internal conflicts affect the efficacy of a working group, but the strength of the choices depends on the active participation of each member.

In this scenario the designer must be able to act diplomatically, trying to give his own technical contribution without being influenced by working team internal contrasts.

As to our personal experience within the Palcoscenico project, the first difficulty was to provide our contribution to two partners having two different visions of the objectives to be achieved. This contrast caused confusion over the kind of support to offer and the output to get .

Another difficulty was to define the nature of our contribution to the project as services designers. The other members of the team immediately noticed our skills in communication, especially in making all the work more noticeable. In fact, since the beginning we were asked oversee the reporting of the meetings: we caught the main points and interpreted them as project tools.

The communicative action must be not a limit. During the project activities we showed that our contribution could also be a methodological and content resource. It is not easy for the ones who work in EU projects (sociologists, economists, educators, administrators) to understand the possible contribution of the designer. They usually adopt a different approach and have a different opinion about what the design activities are.

Naturally, the designer should not be considered as the solution to all the problems, but as a tool to address activities and outputs towards the real objectives.

The designer's vision of the project must match the other actors' visions and activities.

3.3 Managing normative aspects and feasibility of the solution

Our role within the project was to develop service models useful to public administrations as guide to effectively build the initiative.

Project teams usually pay great attention to normative feasibility of the proposed solutions. The most innovative and complex ones are generally distrusted because legal and organizational tools are not completely known.

It is therefore necessary for the designer to provide his ideas with some legal and organizational references with the help of more competent members of the team.

Sometimes feasibility aspects are much more important than the idea itself. In describing the idea to the project partners, it can be more productive to focus on how the service can be activated and supported financially and organizationally than to dwell too much on qualitative and evocative aspect of the service.

In order to grant continuity to his ideas, the designer has to try and realize the set of measures reinforcing the path toward the creation of the proposed initiative. It can be useful to adopt creativity also in this part of the project through “unusual” resources. For example, when we designed the “map of stakeholders”, we suggested the involvement of private firms as sponsors, or of low budget resources (associations and civil service).

Some proposal have been considered not very feasible or too complex because we have not been communicating enough about the organizational aspects.

4 Conclusion

This chapter will be showing the results of Palcoscenico project and, within them, which were the contributions provided by Altronde. We have tried to compare the output of this project with those of the previous project achieved by the same partnership

Presentation of the project results and contribution of Altronde

Palcoscenico project was born from the experience of the EQUAL project Equi.libra, developed between 2003 and 2005. In this project a set of actions were promoted and activated. The concrete results were the training of 15 “work-life time balance” agents and the experimentation of actions of organizational processes in 10firms.
But these attempts often clashed with a context in which the proposed actions did not have continuity in time because they were colliding with organizational and cultural problems within companies and the realities involved.

“Palcosc&nico” represented the desire to operate in processes of change about the specific issue of work-life balance. The project wanted to carry on the experience and make it sustainable by expanding the action and the number of interested actors. The project began focusing on different goals that have given rise to several actions:

- the creation of an action to increase awareness and information on the issues of “work-life time balance” from which a communicative campaign was born.
- the creation of a “work-life time balance” agency with front offices providing citizenry and local organizations with consultations for the actuation of work-life balance initiatives. The agency also offers guides for the development of services (PALC).
- the experimentation action in which a stakeholder started to activate the construction of some initiatives and services aiming at satisfying the work-life time balance needs.

We believe that our participation to the project enriched the different actors orienting and awakening them towards a different and final user-centred planning approach.

We believe that our contribution as designers within the project provided two kinds of contribution: a practical and a cultural contribution.

The practical contribution consists in the development of the analysis and design output (local context mapping and service ideas), with a considerable amount of information and ideas which can be easily read by anyone.

The cultural contribution consists in the emphasis we gave to the possibility to address to the final users this kind of design: we focused on their real needs by developing services designed to satisfy their needs with direct actions.

4.1 Suggestions for the designers (to work in a European project)

- Try to play the role - within the team - of the ones who's task is to address the works toward the real objectives;
- Try to design new creative tools and methodologies for the purpose of increasing activities efficacy. This is suitable from the analysis and comparison phase till the development of solutions and services.
- Study and delve deeper into the issue of the project developing the feasibility of own ideas.

4.2 Suggestions for the Development Partnerships (to have a design oriented approach)

- Try to simplify, making the path of the project more fluid. This kind of approach is suitable both for communication and language and for definition of objectives and activities;
- Make the project activities more informal and easier, searching for elements to make the participation to the project more satisfying.
- Encourage the integration of creative figures in the working teams and try to increase their value by giving them a strategic role within the project.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design stories for a sustainable society

Case studies of responsibility in practice

Judith Mottram[1], Paul Atkinson[2]

Abstract

Three design projects tackling the energy challenges facing contemporary society provide the focus for this paper. The projects include the design of an anaerobic digestion facility and associated greenhouse capacity; a light-industrial wind turbine; and street lighting. They originated without client brief from a small company in Leicester, UK., and embody elements that constitute a model for responsible design practice. The stories of these projects are distinguished by the way they highlight the necessary conditions for creativity - knowledge at and beyond field boundaries, combined with a vision of and strong motivation for change. As such, they suggest how designers might engage with the challenge of sustainable and responsible practice and verify models of the conditions for creative innovation.

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1. Introduction

The focus of this paper, in common with several earlier studies of designing, is upon a small design consultancy, rather than upon design within a manufacturing enterprise. In contrast to earlier work, this study looks at three projects by the same company, to explore whether market sector or product scaling impacts upon practice, thinking or strategy. Cross noted that most studies of 'designer behaviour' have used novices as respondents (Cross 2003). Methods used include video recording or protocol analyses of designers at work, used to model design thinking or to explore design creativity (Kavalki & Gero 2002; Ball, Ormerod & Morley 2004; McDonnell, Lloyd & Valkenburg 2003), but interviews do appear to form a key approach to eliciting information about the practice of professionals in the field (Roy 1993; Cross 2003). Whilst this paper makes no claims for the expertise level of Atkinson Design Associates, the sustained practice of the company over 25 years is considered to enable the enquiry to claim some insight into the nature of the practice, which has received no external recognition for their specific contribution to the sustainability agenda.

The research method for this current study draws upon the approaches of Roy and Cross, although previous collaborations provided enough familiarity for an initial modelling of a design process where 'vision' was an important tool or stimuli for practice. Preparatory reviews included scrutiny of some previous literature on design case studies and on the modeling of creativity and innovation across disciplinary fields. The initial framing of the hypothesis was that issues such as the sustainability agenda could provide a driving principle for design thinking. It was anticipated that stories, framed as metaphors and held up as exemplars, would be a powerful part of the communicative processes employed within design practice driven by an absent meta-client.

The use of strategies for design development, and the role of specific subject and boundary knowledge was also of interest, and their fit into models of research-informed design or design-led research. A standard interview schedule was the basis for three conversations about discrete projects. The resulting transcripts were subject to a simple coding exercise using headings derived from the hypothesis. The analysis reflects on existing models of design thinking and practice, is necessarily interpretive, but draws upon the distributed understandings of the field.

While not engaging formally with narratological methods as part of a design process, the analysis did explore storylines within the interview transcripts. This builds upon the four main roles that stories might play within a design context, as reported by Turner & Turner (2003): giving the audience a progress account, providing an 'index' to previous events, identifying different perspectives or 'competing rationales' for an object, and as a 'socially constructed meta-story of the process'. The similarity of narratological theory to the approach taken by Wenger (1998) in the research that led to his discussions of 'communities of practice' is also noted.

2. Interweaving stories

The coding of the interview transcripts identified that the respondent tended to use a number of interweaving stories to structure his answers. He tended to give long and fairly coherent responses of between 600 and 1200 words, to quite short open questions, indicating a ready propensity to articulate his memory of events. The repetition of the stories about Concorde and Fiat (LS5 and AS4, and LS6 and AS3) clearly provide important touch-stones for current activity. The respondent did query the labelling of the narrative strands as stories, concerned that a story might be perceived as 'not serious'. However, the extent to which analogues are used to model indirect responses to direct questions was then accepted as justification for the label. Table 1 below indicates the stories in each project account:

Lighting	Turbine	Anaerobic
Collaboration (LS1)	Design Idea Development (TS1)	Project Description (AS1)
City Trials (LS2)	Finance (TS2)	Anaerobic Process (AS2)
Carbon Trust Funding bid (LS3)	Potential Private Investor 1 (TS3)	Fiat Panda (AS3)
Project re-shaping (LS4)	Potential Private Investor 2 (TS4)	Concorde Lighting (AS4)
Concorde Lighting (LS5)	Potential Commercial Investor 1 (TS5)	Finance (AS5)
Fiat Panda (LS6)	Potential Commercial Investor 2 (TS6)	Clients (AS6)
	Design Materials (TS7)	Previous Innovation Project (AS7)
	Competitor 1 (TS8)	Competitive Projects (AS8)
	Competitor 2 (TS9)	Teaching (AS9)
	Fragment of anaerobic story	Designing (AS10)

Table 1: stories about design projects

While the stories in the account of the Lighting project were essentially sequential, LS2 is resumed after LS3, and is used to lead gently into LS4. LS3 is reintroduced after LS6 while Atkinson is summarising the thinking in terms of key or core principles that permeates all three major projects covered by the interviews. He had been talking about how, in relation to the lighting project, 'the whole design ethos is to chase carbon out of products', which meant that the 'design principle is like falling of a log. 90/95% of this project is grounded in common sense and the reduction of CO^2…so it's not inventive, it's following common sense'. He then went on to say,

> If you look at the three projects, they share absolutely common stimuli. In the case of anaerobic, it is to develop a process that maximises methane production because by doing that you maximise renewable electricity against the competitors in the market place. In the case of the wind turbine it's to deliver a serviceable machine within reach of human scale that can be rugged for twenty five years and be cost-competitive against other renewable technologies in the wind economy. And in the case of lighting, … You work with a brilliant lighting engineer, the remarkable work of Berman and his conjecture and the rest is fiercely logical, … ultimately, the products look good …, but that isn't the driving energy behind the project (forgive the pun). The issue is carbon. Non-carbon, low carbon.

Following this short account of the key principles driving his professional objectives, the reintroduction of the story about the Carbon Trust funding bid acts as an exemplar story to illustrate the problems faced by the company in relation to raising funding to support their sustainable initiatives.

Against a similarly regular introduction of new stories, there was slightly more interweaving of stories in the account of the Turbine project. The fragment on the Anaerobic project followed TS2 on finance, and was used to explain the difference in terms of scale of elements within the project while stressing their similarity. Progression to the other stories about the potential investors followed sequentially, Towards the end of that story (TS5), Atkinson referred back to TS1, TS2, TS3 and TS4 before moving on to TS6 which referred to contemporaneous events. Prompted by a question on the business perspective of the project, a brief response picking up the initial project development story was punctuated by an emphatic statement denying the existence of

any underpinning business logic propping the project up. This was followed by an equally strong assertion of the climatic rationale for the project:

> The design logic is that Britain benefits from a highly advantageous wind climate in relation to the rest of Western Europe. So if you look at wind modelling, especially in northern Britain and Scotland, the wind energy available for this island sitting in the ocean is approximately twice the net energy available for the whole of the rest of the European continent. So Britain is a good place for wind energy

The justification for the design solution was given by the following question: 'if we can generate energy and renewable electricity from wind energy much closer to the planet, can we indeed build multiple micro-turbine infrastructure out of view of the general public?', explaining the rationale to counter objections to large-scale turbines. What appears to be indicated by the structure of the narrative is core principles and design thinking being used to alleviate anxiety about an unsupported business model.

The stories in the account of the Anaerobic project are essentially sequential, but with the opening and second stories about the project framing and the system of the anaerobic process itself reappearing between AS5 and AS6 and AS8 and AS9 respectively. This looping back again served as a vehicle to reassert some of the core design principles about the project. When first talking about the project inception, Atkinson referred to the base-line drivers for the project: to build new and sustainable employment opportunities for a post industrial community, to start dealing with the waste close to its generation and to engage intelligently with a raft of new legislation including the Animal By-Products Regulations of 2005. When talking about funding (AS5) he referred again to the base-line principle of how the project could impact upon employment when challenging the agricultural consultant's advice on budget modelling (2nd emergence of AS1):

> We'd always put £10 per employee per hour into the business plan and they seemed to think we could shave that in half and pay minimum wage, which completely contradicts the ethos of a modern industrial company using modern industrial methods and paying people honourably for a fair days work and adding value to the economy through their activity rather than being a new, British, agricultural sweat shop

When talking about existing anaerobic digestion systems (AS8), he notes they were all 'conceived, designed, developed, commissioned and built prior to the ABPO legislation' but were antithetical in nature to the current project in 'their nature, their dimension, their capital spend, their scale of infrastructure'. He returns again to the anaerobic system (AS2), describing taking waste only 15 to 20 miles from its 'arising', and the logic of a dispersed multiple micro-technology solution and the proximity principle. The story of the system was maintained through answers about competitor products and the design process – the solution and its modelling provided the vehicle for talking about design office activities:

> generating engineering layouts and plans, plan elevation, play layouts, side elevations, side section analysis, trying to build an architecture that would sit close to landscape. We set again I think a self-imposed criteria, of could we make anaerobic digestion succeed within a roof ridge architecture of 6 meters… so the whole architectural model could sit discretely within the land, or on the landscape, rather than being a.n.other monumental British stupid shed. That the building should be smart, not stupid, should look good, not bad

The stories of the Fiat Panda Designer (AS3, LS6) and previous work for Concorde Lighting (AS4, LS5) appear in both the account of the anaerobic project and in the account of the lighting project. The narratives seem to operate as an analogue for the principles which underpin Atkinson's design ethos. Like the Panda designer, he wants to deal with the system and its manufacturing, as well as the end product. He also has a measure for realising those principles through the Concorde lighting project, which had outperformed in profit to the manufacturing company compared to any other product. Atkinson's analysis of how this happened is as follows:

> that the product was good for the market, the customer, the people in the trade fair and the international distributors network that buy it and sell it, but it was great for the blue collar worker… the best workers out of 300 workers in the factory all wanted to make that fitting, they all enjoyed touching it assembling it and putting it in boxes.

The penultimate story in the anaerobic account was presented in response to a question about whether tools or methods like scenario analysis, backcasting or brainstorming were used in any conscious or formal way as a part of the design process. The response was contained in a story of 1000 words, which detailed two projects Atkinson had participated in when teaching on Industrial Design courses. This story operates as an analogy for a descriptor of his underpinning design principles, and suggests that such analogical models could be more successful than explicit engagement with scenario building or other design methods. His brief to the students was to design a furniture programme, but the students also had to find a real building and identify a prospective occupant:

> Concurrent with finding themselves an architecture they would also invent a business, and by inventing a business I didn't give a damn whether their business employed 15 people and was in the fashion industry, because the boy had a girlfriend who was studying fashion at Northumbria at the time, or that they would run an insurance company.

As well as identifying the company, the students were asked to flesh out the company business plan:

> what was the core business activity of the company, did it employ 20, 30, 40, 50, 100 people? did it have a front desk, did have finance, did it have marketing, what were they doing, what were they selling, which service were they providing?

The responses of the students included inventing company structures and descriptions of hierarchy and management profile and then 'they would then spend the rest of the 6 week project, conceiving, designing, developing and manifesting a furniture solution for that architectural interior to sustain that business model'. The work produced by the students was considered to be exceptional and the basis for this is believed to be that:

> the furniture had meaning, the kids had a population to match, through visual expectation and functional expectation. So the furniture project could succeed because they were matching the hypothetical customer invented by themselves, with a real building, found by themselves

Atkinson recognised that this process could be called 'sophisticated scenario building', but then recounted another education project consciously using a scenario-building model. He described that project as 'kind-of shallow, thin, super-theatrical assessment of cause and effect, or need and demand', and asserted that a brief 'could only succeed if you put enough flesh on the bone'. As single cases, these vignettes seem to be operating more as an analogical means for responding indirectly to the question about the use of tools and methods, rather than as judgements upon the teaching methods of two institutions.

This use of stories to provide an analogous description or vehicle for accommodating the aberrant behaviour of other parties sits slightly outside Lloyd's framing of the roles taken by stories in design as reported by Turner & Turner (2003). Some of the Atkinson stories sit within the model of progress accounts, detailing the way in which an idea or scene unfolded, but the characterisation of the players lifts the stories beyond that simple functional role. There is an element of indexing in the use of the Fiat and Concorde stories, in terms of providing a benchmark, used to re-affirm core design principles. The comparative notion of competing rationales is hard to identify, apart perhaps from where embedded in characterisation. The sketches of the waste operative with personal vested interests, or the council waste manager as 'an interesting man … never seemed to be there, never replied to phone calls,… always seemed to be on holiday, or vacation, or leave, and drives a very, very large Mercedes', enable a value position to be asserted by the narrator.

3. Character modelling

Characters in the stories are personalised beyond the ‘flat’ characterisation one might have anticipated in an interview situation, and enables this embedding of value judgements. Such values assigned to the individual players in the stories tended to be positive, extolling personal attributes such as honour, intelligence, humanity. The two potential private investors in the Wind Turbine are each depicted in such a manner. One was ‘a quite brilliant industrialist… had a fantastic reputation in the aerospace industry’. He declined the investment opportunity within three or four weeks on the basis that the forecast 20% returns were modest in comparison with his recent investment in a Japanese company he had recently acquired. He was described as ‘very open, very sincere and we were disappointed but thanked him’. The second potential private investor was also a retired industrialist. The transcript includes a 200 word account of the story of his ‘beautiful apology’ detailing the family persuasion for him to fully engage with his retirement, rather than investing in the Turbine project.

What seems to be happening is that Atkinson is humanising some of the inexplicable contradictions or disappointments that arise within his stories. In talking about a previously successful investment recipient from the first potential commercial investor for the Turbine project, he recounts one vignette about dispatching the obstructive lawyers then reaching agreement, and a second about meeting a competitor who ‘was a decent guy but I don’t think (he) fully understood the implications of our proposal’. In the anaerobic account there are both positive and negative renderings of specific players in the narrative. While one participant in a due diligence meeting was described as making ‘a series of highly contentious and highly disruptive remarks’, including one that directly opposed the fundamental principles of the project (‘why didn’t [the company] simply ship the shit to China for the same gate fee’), he still managed to cast some positive connotations on the company chief executive who aborted the meeting:

> the female chief exec who should have been running the meeting, walked into that meeting 2 hours and 45 minutes after it started, with a sincere apology to the room, so 14 people stood up and bowed, and thanked this remarkable woman for attending her own meeting...

However, the ensuing story of how the meeting played out rolled on to leave the meeting over in the next fifteen minutes. The meeting ‘was disbanded unceremoniously by a female sales exec who wasn’t that interested in waste management anyway’, to enable her to work on the deal she had brokered while the due diligence meeting was being undertaken. Atkinson closed the story by summarising that ‘the circumstances for failure of due diligence were about as corrosive as they can be’, and seamlessly moved on to a positive story about an earlier project with an investor.

4. Design process

When talking about the practical aspects of designing, Atkinson tended to frame responses in terms where the design decisions are the result of evaluations. On the Lighting project, he describes the original need to draw a scientist onto the team to resolve ‘a real technical difficulty…’ arising in resolving the lighting requirements for a series of display units. The solution was to take the ‘highly disadvantageous point of illumination at high level’ and complement it with ‘lighting from the back and beneath of the display to balance the lit conditions’. The lighting scientist Atkinson drew on to solve the problem ran a software program for 26 hours to analyse the complexity of the ambient lit conditions for the cabinets, and thus determine the lighting needed in these other locations. The strategic recognition by Atkinson and the scientist of the potential to work together on future projects arose from this sharing of knowledge between them. In talking about the opportunity evaluation to take on the street lighting challenge, Atkinson notes the state of the field:

> The optical systems are poor, the lamp technologies are thirty years out of date, the science that underpins the photopic debate is in our terms discredited, new understandings of human biology determine that the scotopic dynamic is relevant and the photopic dynamic is redundant, the practice that is commonplace worldwide throughout the second half of the twentieth century is irrelevant, and that there are massive new opportunities for energy saving

This analysis of opportunity then drives the practical combination of prototype development and testing, including an ‘elaborate tap dance of making near replica but not recognisable designs’ as they couldn’t use the prototypical form in the city trails.

The most extensive discussion about the evaluation of materials occurred in the account of the Wind Turbine project. Atkinson noted the scale of drawing and model-making included:

> draughting and drawing, a lot of three-dimensional model-making, a lot of autocad, sizing, re-sizing, restructuring, a lot of inventive step in new structures, … every project we look at invites a new analysis of best-fit and fitness for purpose, so the most recent studies look at a dozen different technological strategies to make this damn thing, including alloys that, alloys this, alloys the other, steel this, steel that, steel the other

As well as talking further about material selection, the account makes extensive reference during this 1000 word section (from nine minutes of interview), to wind speed, rotor performance and the energy generation models produced by the combinations of variables, and to how the design scaling of the rotors might impact upon the rural landscape situation that could provide the first implementation of the turbine with the second commercial investor. The notion of chasing carbon out of designs was considered for the whole supply chain, exploring the implications of different materials for scale and embodied energy.

The principle that the projects under consideration were ‘industrial’ design projects was explicit in Atkinson’s analysis of a competitor turbine project. Despite being ‘shocked and distressed’ to find ‘essentially our proposition being developed by the University of Illinois’, the ‘laboratory lash-up’ added to their determination to succeed. Atkinson noted that he was keen:

> to engineer a machine that arrives in a box, a big box, and is engineered ruggedly to hit structural objectives at the maximum and unit cost at minimum. There is no evidence of that thinking within the American project

5. Knowledge

The project accounts indicate that knowledge from beyond the domain of design was actively sought to resolve design problems, and then the familiarity with those new knowledge fields was used to stimulate the development of new thinking. The chance encounter with Berman’s 1992 paper on scotopic sensitivity stimulated thinking which built upon previous experience on luminaires with Concorde Lighting. His increasing familiarity with the upcoming legislative framework on energy, understanding of embodied carbon and propensity to recall facts and figures, provides a convincing context for innovation.

Knowledge of the legislative context was key factor in all three projects. In Lighting, it was noted particularly in relation to the Health and Safety and Law and Order responsibilities of town and city councils and the law enforcement agencies, for the Turbine project in relation to materials recycling. For the Anaerobic project, the legislative background on waste management generally, and the aftermath of the UK Foot and Mouth outbreak in 2001, stimulated the conceptual framing of the project. ‘17 or 18 converging legislations’ determined ‘that this issue will get dealt with’. The respondent noted that ‘the key underpinning information that we had beyond common sense that we could see with our own eyes was that there was this monumental national problem’. When questioned on sources of information used in the design process, Atkinson talked more about process rather than information. He noted:

> common sense is very helpful. Designers generally make conjecture, and then set out to test that conjecture, or they build a hypothesis of a theoretical model and they set out to test that theoretical model, and we do that more or less every day that we work. Its certainly true of a classic industrial design project, where the client comes to you and says, 'this is our dilemma, this is where our competitors are going, we need one of these, we're quite uncertain about what one of these means, that the key characteristics of one of these is this, this and this', and at that point the client has thrown you a design brief and your challenge is to understand the forces acting upon the market and contemporary products available in the market, and to design a better product. But every sketch you make is a hypothesis, it's an attempt to address one or some or all of the criteria embroiled in the client brief

What appears to be evident from the three project accounts is that accessing relevant deep and current knowledge from the domain of the problem is part of Atkinson's core design process. By engaging with information about issues and past work in the fields of energy production, waste management and optics, the design company appears to have developed the intellectual basis on which to make design propositions which embody an incrementally more fundamental re-working of problems than existing solutions.

6. Design models

A closing interview session covered generic issues relating to all three projects. The key topics were publicity and project dissemination, the company business model, and awareness of environmental standards, environmental policy toolkits, and design models. Through this latter section, the stories are primarily 'progress accounts', with a strong emphasis on design process and core principles.

Atkinson's account of the design of a corporate headquarters, a response to querying absent clients for sustainable projects, noted how they prompted a technical sales representative to use a 'green' ticket to argue for the specification of a high quality product with particular aesthetic qualities over 'a really cheap petrochemical product'. This story was also responding to the apparent irony of presenting the headquarters project as being primarily about aesthetics – 'the most beautiful headquarters interior we've designed in the practice 25 year history' – after visual attributes had been only occasionally mentioned in the preceding discussions of the Turbine, Lighting and Anaerobic projects. In terms of design scope, this interiors project was described as:

> a study in space, light and management proximity and management dynamic, you know, with ergonomics thrown in so a little to do with science and a lot to do with perception… we're trying to build a corporation that is optimistic and forward-looking rather than pessimistic and backward-looking, and the environment should sustain that collective psychology

The same sort of values and principles that motivate the sustainable projects forming the main focus of the interviews appear to be fundamental elements of the design strategy for this underpinning commercial commission focused on improving a corporate environment.

While Atkinson recognised his projects did share characteristics with the model of the relationships between product strategy, product development, production and tools for environmental improvement (ESTO 2000, 8), he found that model 'fiercely convenient and fiercely linear'. He noted that in the projects discussed the design team went 'back to the beginning three, four, five and six times on each of the three projects'. This looping back was considered unusual in mainstream product development, which more often emphasised 'simply getting the product to market commercially tomorrow, you know, the feed and drink of design activity, or decorator activity'. This looping often incorporated stakeholder reviews where:

> the chief exec. or the board…or head of marketing or head of technology… and they review the intuitive work – the conjecture by the design team – and they say 'oh my God, you've got to be kidding, you can do that. If you can do that, can you do this?

What Atkinson did feel was missing from the model was 'the politics of the public purse, the politics of pubic difficulty, corrupt officers, the politics of learning and reviewing policy in light of that learning'.

It was apparent that Atkinson was not familiar with the toolkits and checklists developed to support sustainable product design. There was an element of cynicism about the usefulness of such tools, with a strong indication that deep knowledge and a clear value agenda were far more important for driving change. Reflecting on the projects covered by the interviews, he felt the proposition that small and medium-sized enterprises (SMEs) need to be provided with toolkits and checklists to support sustainable approaches to design was immature. He noted that one cannot just talk to stakeholders at the commencement of a project, but this must be embedded as an ongoing part of the process: 'you have to have a form of that, not using jargon – but hopefully sincere language – at every stage, and as for brainstorming techniques, we, we call that thinking'. Essentially, his perspective was that 'Its just design that is targeting CO^2 or CO^2 reduction, so it isn't consciously an eco activity'.

The problematic aspect of encouraging sustainable design was seen to be the same as getting design embedded or understood within the management philosophy of a company. It was seen as:

> all very well going forwards with a rule book on eco design, but if your client is unwilling or unable, you're going to have real problems, so you can write the manuals if you want to, but I don't think government has begun to understand how difficult these issues are.

The centrality of design between technology (engineering, materials, science) and human-centered values (sensation, appearance, touch) was stressed when discussing the modelling of the industrial context for design as presented by Rust, Roddis and Chamberlain (2000). Atkinson suggested that their reworking of Heskett's positioning of design should be reviewed again, stressing the importance of communication, not marketing, as the vehicle for human-centered analysis, moving design to sit across the junction of the two axes, and bringing in Finance as a distinct element as the conduit for a synthesis of human values, 'the currency, the underpinning enabler'.

7. New models or an idiosyncratic case?

The outcome of the interview analysis is a reframing of the original hypothesis. Instead of stories primarily providing metaphors and exemplars, the narratives could more correctly be described as being analogues providing abstract models of design principles. These are not analogues in the mode of Ball, Ormerod and Morley's concrete solution elements (2004), but rather they appear to be descriptive models which embed the principles underpinning design process, through a mechanism where the specificity of past solutions does not constrain creativity. These stories also carry characterisations of players in the story, which enables their behaviours to be accommodated. The interviews also confirmed that the absent meta-client functions as a driving design principle.

Given that the initial interview schedule had purposefully excluded some of the issues focused upon by previous work on expert designers, the fit of the data resulting from this project to earlier models is rightly partial. However, there is a reasonable match between Cross's general model of creative strategies (2003) and the cases under consideration here, despite Atkinson's discomfort with its simplicity. Roy's earlier identification of characteristics of creative processes in design (1993) had identified constructive discontent, idea and technology transfer between applications, practical experimentation and attunedness to market potential as notable aspects of the expert designer. All these factors are evident here, although the features of his second case

(introductions to markets by a third party, the use of biological analogies and visual brainstorming) were not so notable.

The cases described in this paper also provide some confirmation of the models of design thinking described by Owen (2006), although the collaborative nature of the projects in their more mature stages begin to combine design thinking with other modes of operation. Owen summarised the characteristics of creative thinking identified by Fabun, Arieti and Csikszentmihalyi, and added to this his own list of the additional features other than creativity, that he saw as characterising design thinking. He noted the balance these features had with science thinking - when conceived as a pair of approaches they would have significant potential to influence policy decisions at strategic, governmental levels. Atkinson's work falls into Owen's category of 'conditioned inventiveness', where tangible solutions for specific applications are developed. There is an element of 'what'-focused (scientific) enquiry underpinning the modelling of solutions for specific sites in relation to turbines, anaerobic and lighting, as local conditions are modelled to determine new challenges for either the technological process or for the material considerations of the possible design solutions.

The focus on having a client is one factor that clearly differentiates the cases reviewed – in Owen's terms design thinking has a 'human centred focus', unlike science and technology who share with the arts the characteristic of explorations proceeding 'where discoveries direct'. He does note that 'environment-centred concerns' have given design thinking 'a second, omnipresent and meta-level client: the environment', which today has to operate as an overriding qualifier for any activity in the field. This meta-client was clearly the main driver for the cases reviewed here, although the business model has flaws. The extent to which science-thinking adopts this client and its concerns, within a functional business model and as an operational value and measure, depends upon whether science could adjust towards making and inventing rather than finding or discovering. It might require intentional collaboration with the thinking skills of the designer, possibly as exemplified by these cases.

Atkinson rejected the idea of toolboxes to support 'eco-design' by SMEs. This suggestion arose from the European Commission's work on the systematic incorporation of environmental factors into product design and development (ESTO 2000). ESTO concluded that best practice will embed new methods in policy, with communication and feedback, supported by toolbox of databases, software tools, manuals and checklists or protocols. However the current case studies suggest that motivational factors and ability to apply knowledge across known schema's might be more relevant. The challenge may be to train procurement beyond the design field to respect what design can bring to problems, rather than just to operationalise existing observed processes. ESTO also had a very different conception of how design might link with university expertise. They saw the university as developing methods or tools which although not tested in industrial practice might be implemented there (ESTO 2000, 42).

In terms of building a future vision that learns from the case studies presented here, some fundamental assumptions embedded in the European Commission's work may need further review. It saw the challenge for developing eco-design in SMEs as enabling access to new markets for environmentally sound products. While large companies would not need 'further government support to apply eco-design', environmentally-orientated public procurement and fiscal instruments might impact upon their behaviour. This point was forcefully made by Atkinson on several occasions during the interviews. He indicated that a significant resource for grappling with future challenges is the knowledge and vision of the company MD, with motivation to apply his expertise to projects that could make a difference to the world in practical ways. This case also saw an active engagement with the region's universities and businesses, in contrast to the normal conception of the knowledge transfer flow from the university sector.

Cross (2003) pointed out that the relevant first principles are not evident 'until a problem frame has been established', but the meta-client of the sustainable agenda can be conceived to act in a similar omni-present manner to idioms like 'form-following-function'. However, the ability to operate successfully with such broad first principles while engaging strategic process knowledge appropriate and pertinent to the specific problem, is likely to require the expertise

arising from time spent within the disciplinary field. While verification of the specific skills sets and strategies for expert designing is still being modelled on the basis of few case studies, there does appear to be some congruence with generic creativity models in relation to the role of expert knowledge within and at the boundaries of a field, such as described by Lubart (1995), Csikszentmihalyi (1996) and Weisberg (2006). The role of vision and conviction and a context in which to operate meaningfully also accords with the conditions for creativity as identified by these commentators on the generic act of creativity, and such models can usefully be reconsidered when reviewing how to give future designers the tools of their profession.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Shifting Trajectories

advancing cosmopolitan localism through participatory innovation

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Abstract

The central question that this paper seeks to address is whether indeed Africa can 'leapfrog' into a truly sustainable future by using extrapolated scenarios based on evidence from the elective creative community at the FabLab in Cape Town, South Africa.

The FabLab offers an ideal forum for key actors (from government, industry, academia and the civil society) to evolve a unique form of cosmopolitan localism which in turn could inform future design pedagogy and other public policy initiatives.

Whereas the discourse on sustainability is arguably new on the African continent, the (potential) role of design as a catalyst for sustainable socio-economic transformation is promising. This argument locates the vision advanced by this paper within the theme of "Changing the Change".

Keywords

Cultural Diversity, Design Activism; Design for Development; Cosmopolitan Localism; FabLab; Open-Source; Participatory Design; Social Leapfrogging; Socially Responsible Design; *Ubuntu.*

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1. The Beginnings of a Global Phenomenon

Neil Gershenfeld (2005, 12) defines a fabrication laboratory or FabLab as "a collection of commercially available machines and parts linked by software and processes… developed for making things". He describes the humble beginnings of the FabLab phenomenon as a result of overwhelming interest and enthusiasm from students in response to a course he introduced in 1998 called *"How to Make almost Anything"*. The viral profusion of the FabLabs is nothing short of a global phenomenon.

Gershenfeld (ibid) observed that the principle motivation for students' participation was personal (as opposed to professional) interest, and that a fun element characterized the creative atmosphere therein. The unique technical and pedagogic features of this interaction formed the blueprint for what eventually became FabLabs. Some key lessons emerge from these early experiences:

- **Never underestimate the power of imagination.** The impressive and totally unexpected results from students with limited technical, or engineering knowledge was abundantly evident- an experience shared by Victor Papanek (1995) when teaching six and seven year-old children some of the design subjects he taught to university students.

- **Change is inevitable.** The new challenges demanded a totally different approach to pedagogy with teaching methodology shifting from a traditional 'just-in-case' to a more proactive 'just-in-time' paradigm. This created the catalyst for students to invent "a new physical notion of literacy".

- **People are the most effective and sustainable agents of change.** A demand-driven learning process akin to "an intellectual pyramid scheme" emerged whereby students enthusiastically passed on emerging knowledge to other students. Deepuck Chunilall (2007) described this form of peer teaching as "each-one-teach-one".

The FabLab's premise is that "the most sustainable way to bring the deepest results of the digital revolution to developing communities... to enable them to participate in creating their own technological tools for finding solutions to their own problems" (Mikhak *et al* 2002). Each FabLab is initially equiped with the same basic design and modeling, prototyping and fabrication, testing and monitoring, and documentation tools (ibid). Personal fabrication is facilitated in a non-prescriptive manner by promoting access to personal fabrication facilities and opportunities.

Gershenfeld (2005, 8) describes the plan of the FabLabs as one that seeks "to put control of creation of technology back in the hands of its users". Further, Gershenfeld (2008, 14) believes that "emerging technology can help build better communities". This scenario concurs with the creative communities as defined by Manzini (2007a). Indeed, any vision of sustainable living must transform consumers and users to being co-creators within their given contexts.

2. The AMTS FabLab in Cape Town

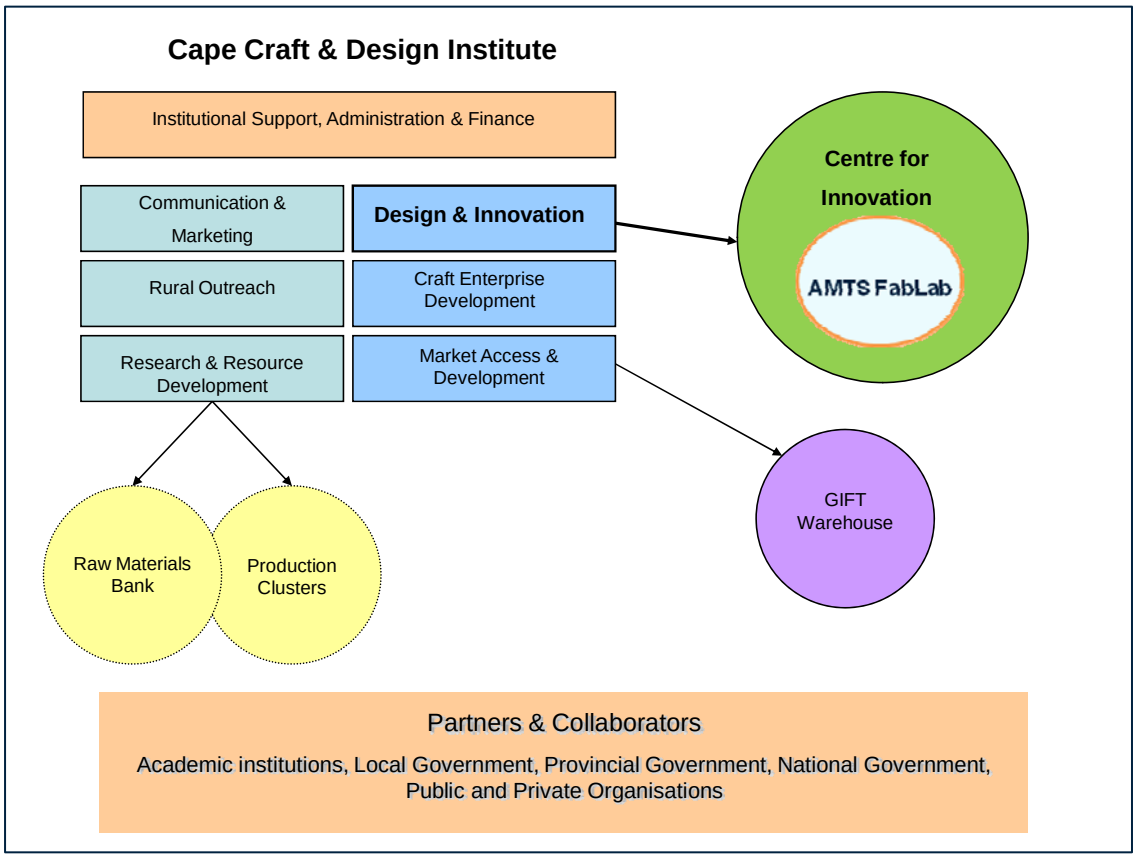
The Advanced Manufacturing Technology Strategy (AMTS) FabLab is run by the Centre for Innovation, as incorporated by the Cape Craft and Design Institute (CCDI) in Cape Town, South Africa. The AMTS FabLab (hereinafter refered to simply as the FabLab) distingusihes itself within the global network of FabLabs as the only one with a specific focus on the craft industry.

According to Erica Elk (2008), the Executive Director, the CCDI was established in November 2001 with a mandate to develop the craft sector in the Western Cape Province. The CCDI has identified the following three primary objectives:

- Provide support to the craft and hand-manufacturing Small, Medium and Micro Enterprises (SMME) sector
- Inform and lobby for an enabling policy and regulatory environment
- Act as a catalyst within the tertiary education environment (Elk 2008).

It has three core functions: Design and Innovation; Craft Enterprise Development; and Market Access and Development (Elk 2008). The design and innovation function inform the Centre for Innovation, and by extension, the FabLab (see Fig. 1). Various partners and collaborators support the functioning of the CCDI financially and strategically. These include an academic institution (the Cape Peninsula University of Technology), local government (the City of Cape Town), provincial government (the Provincial Government of the Western Cape), national government (the Departments of Trade and Industry; Arts and Culture; and Science and Technology) as well as a number of public and private organisations.

Fig. 1: Operational schematic of the Cape Craft and Design Institute *(after CCDI 2008)*



According to Elk (2008) the craft sector has been identified nationally and regionally as a major job creator. Thomas (2006, 60) also highlights the potential contribution of craft production in the (informal) economy, particularly when linked to export markets. The CCDI adopts a sector development approach complimented by rural outreach to facilitate the entire craft sector (as opposed to a limited business focus) (ibid) and believes that a community grassroots approach supports the socio-technical transformation imperative in South Africa, thereby facilitating

empowerment and ensuring sustainability. This is done by actively supporting open-networking and shared resources. The CCDI plans to consolidate its impressive track record of success by:

- establishing a greater number of academic links with CPUT for pedagogic input
- supporting formal research activites within the craft sector for better documentation
- expanding the existing database (of close to 700 members of the crafter sector).

The CCDI holds a monthly forum on the first Wednesday of every month where on average 70 to 100 members of the craft and design community maintain contact, exchange ideas and best practices. The forum is informative and educational and provides networking opportunities. Elk (2008) reports of countless instances of spontaneous partnerships that have formed out of such meetings. A monthly newsletter reaches over 3000 people, including service providers and retailers (ibid).

Alan Alborough (2008), a renowned fine artist and Manager of the Centre for Innovation, emphasizes the need to sustain access and stresses the importance of using the Linux open-source software as it is freely available to anyone with acess to a computer thereby ensuring inclusiveness among co-creators. Gershenfeld (2005, 15) also argues that open-source software forms the basis of a proprietary business model. Indeed the principle of 'access' is one of the key elements of the FabLab charter. C.K. Prahalad (2005, 18) adds further elements of 'affordability' and 'availabilty' to compliment that of 'access'.

Alborough (ibid) endorses a view supported by other commentators on the value of maintaining sustainable collaborative human networks (Gershenfeld 2005; Johansson *et al* 2005; Prahalad 2005; Thackara 2005; Manzini 2007b). He seeks to effect the mandate for promoting design and innovation through a number of activities:

- extending the outreach programme effectively targeting historically disadvantaged communities for inclusion as well as accommodating non-English speaking users
- strengthening links with community primary schools to encourage young innovators to access the FabLab from an early age
- increasing the percentage share of the number of crafters and members of the general public accessing the FabLab.

Deepuck Chunilall (2007) has an engineering background and is the FabLab Manager. Chunilall (ibid) reported that there were 9 FabLabs in South Africa, 1 in Ghana and about 50 globally (there were only 15 world-wide six months earlier). He sees the viral spread of FabLabs globally as a result of robust networking within the global galaxy of FabLabs- a powerful expression of what Ezio Manzini (2007b) describes as "cosmopolitan localism".

Chunilall describes the FabLab as an innovation incubation centre. To sustain an effective collaborative network, the FabLabs in South Africa hold quarterly meetings. Chunilall also attends the international weeklong meeting/symposium that brings together representatives from FabLabs across the world. Here, members exchange best practices and present interesting case studies based on their own contexts. To this end, the FabLab in Cape Town is unique in the galaxy of FabLabs due to its focus on the craft sector, and the specific involvement of design students (Elk 2008).

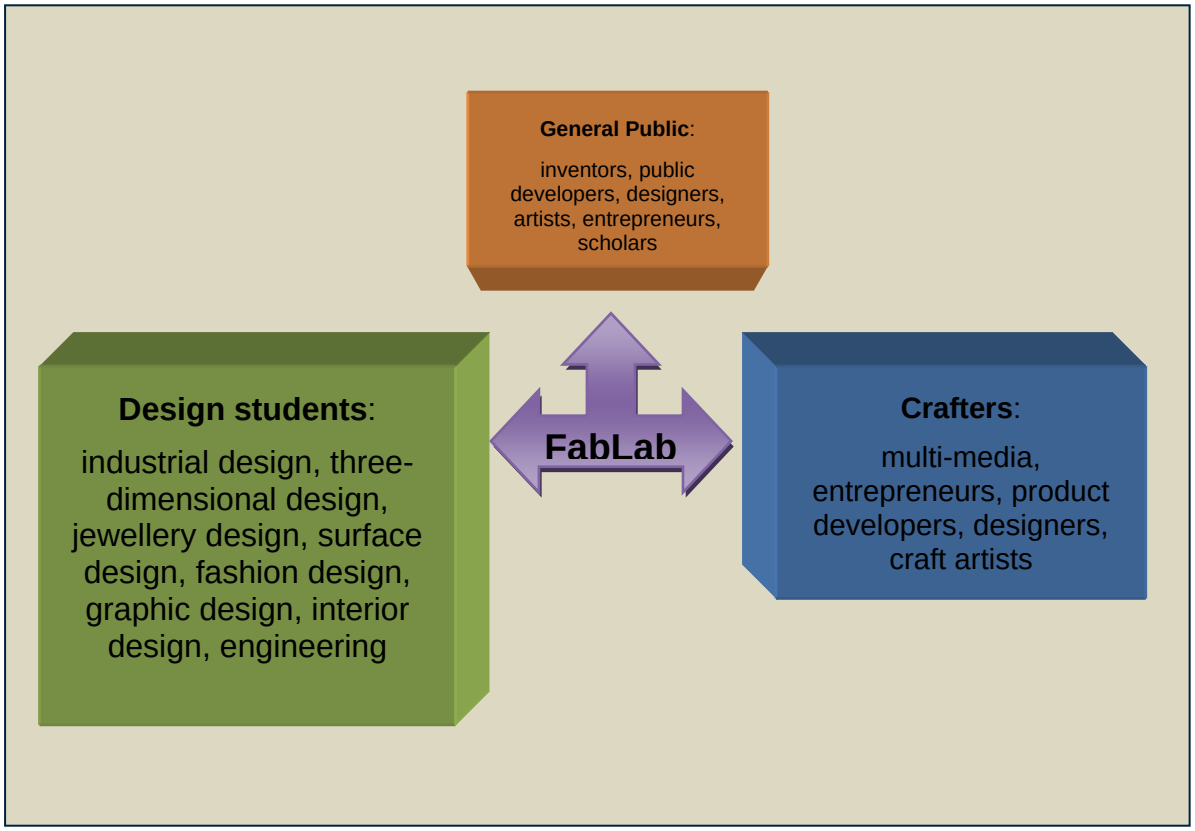
The intimate link between the CCDI and the FabLab is particularly propitious when one considers the potential impact of combining traditional craft techniques with design methodology. Gershenfeld (2005, 6) was pleasantly surprised to learn that "starting out with skills more suited to arts and crafts than advanced engineering, … [students] routinely and single-handedly managed to build complete functioning systems". The common features of craft and design praxis after all include distinct acts of conceiving, designing, and producing an end-product.

3. Everyone's Invited

The AMTS FabLab in Cape Town is open on weekdays from 9 am to 4 pm, and from 9 am to 12 noon on Saturdays. The public are free to use the facilities on Mondays, Wednesdays, Fridays, and Saturdays whereby they can participate in technology demonstrations which are held twice a day- an average of 12 tech-demos per week or 48 per month (Chunilall 2007). Dedicated workshops are run on Tuesdays and Thursdays by prior appointment through the Centre for Innovation (Alborough 2008).

FabLab assistants and facilitators typically work about three hours a day for four to five days every week. During this time, they interact with about 25-30 visitors a day or roughly 150 users per week. The vast majority of these visitors are design students (almost 70%). These students are drawn from the disciplines of industrial design, three-dimensional design, surface design, fashion design, graphic design, interior design, and engineering (CCDI 2007). The majority of these students are from the Faculty of Informatics & Design, working on "curriculum-based and project-related activities" (CPUT 2007, 5). Crafters (multi-media, entrepreneurs, product developers, designers, and craft artists) make up about 20% of those using the facilities, whilst the remaining 10% are drawn from the general public (made up of inventors, public developers, designers, artists, entrepreneurs, scholars, and an assortment of other individuals) (ibid). Visitors range in age from youth in their early teens to the occasional senior citizen. Fig. 2 illustrates the three major constituencies interacting at the FabLab.

Fig. 2: Interactive constituencies at the FabLab



Interviews conducted with four FabLab assistants/facilitators (all in their mid-twenties) give useful insights on the nature and dynamics of interactions between various users. Johan Johnston (2008) is a design student and describes the typical user of the FabLab as "an industrial design student creating proxy models for their projects". Johnston has been using the FabLab for about fourteen months and interacts mainly with design students from disciplines such as industrial design, jewellery, fine art and fashion design. He describes his main form of interaction with users as one of providing assistance with software layouts and settings, problem solving involving materials, and integrating various materials to make models. The only major challenge is in maintaining fidelity of files when he has to convert Computer–Aided Drawing (CAD) files to Linux software.

Sandile Cele (2008), a product developer, has been using the FabLab since November 2006. Cele enjoys the brainstorming sessions, and states that that open-source software is a great idea as it ensures accessibility to anyone with a computer. He interacts mainly with crafters and design students. According to Cele, the relationship between design students and crafters is mutually beneficial as the two constituencies share experiences. This view is shared by David van Staden (2008) and Chris Jones (2008). Jones observes that the design students routinely help out and share their technical and design skills with the crafters. The crafters in turn share their typically superior knowledge of fabrication. The summary of the FabLab assistants/facilitators' responses are captured in Table 1.

Table 1: Summary of FabLab assistants/facilitators' responses

NAME	INTERACTS WITH	EQUIPMENT USED	MATERIALS USED	SOFTWARE USED	FABLAB VISITS
Sandile Cele	students, crafters	laser cutter, milling machine, vinyl cutter, embroidery machine	cardboard, vinyl, Perspex, card, paper	Linux 'open source'	4 days/week
Johan Johnston	students	laser cutter, milling machine	Perspex, other plastics	Linux 'open source', other CAD software	5 days/week
Chris Jones	students, crafters	milling machine	Perspex, other plastics	Linux 'open source', other CAD software	4 days/week
David van Staden	students, crafters, general public	laser cutter, milling machine, vinyl cutter,	cardboard, vinyl, Perspex	Linux 'open source', other CAD software	4 days/week

4. From Economic Passivity to Participation

The world that we live in is fraught with contradictions. Whilst a privileged minority enjoy a life of conspicuous consumption, the majority of the earth's inhabitants barely eke out a subsistence existence. Gershenfeld (2005, 13) speaks of the gaping "digital divide". Various design commentators propose socially responsible design as a sustainable strategy to foster

development in developing and majority world contexts (Whiteley 1993; Papanek 1995; Sandhu 2002).

According to David Fick (2006, 17) “Botswana and South Africa developed the strongest investment climates in sub-Saharan Africa between 2003 and 2004”. South Africa accounted for 38% of sub-Saharan Africa’s gross domestic product in 2004 (Fick 2006, 166). This would appear impressive for a country with an annual growth rate averaging 4% for a population of 48 million. However, upon closer scrutiny, evidence emerges that this ‘success’ is not shared amongst all the country’s citizens, particularly when seen against the official development policy that perpetuates a form of ‘economic dualism’ (Frye 2006, 2). The president of South Africa, Thabo Mbeki (1998 cited by Frye 2006, 5) refers to this problem as the “two nations” paradox. The first one enjoys world-class socio-technical privileges whilst the second more populous one is underdeveloped and characterised by lives of abject poverty. Frye (2006, 2) argues that the ‘two economies’ discourse amounts “to two starkly disconnected communities” with separate economic ‘prescriptions’.

As intimated earlier, the so-called ‘first (or mainstream) economy’ as a major generator of products and services positions South Africa as the largest economy in Africa, therefore enjoying relative free reign in running its own agenda (Fick 2006; Frye 2006; Boon 2007). On the other hand, those in the abject ‘second (or informal) economy’ incur what Prahalad (2005, 11) describes as a ‘poverty penalty’- where the poor pay a higher premium on everything in comparison to the rich. At the bottom of this economic pyramid unemployment runs as high as 42% of the working-age population (Fick 2006, 166). Frye (2006, 3) lays the blame squarely on the government by arguing that “poverty and unemployment are a direct result of the current growth path patterns of ownership of the means of production, and the methods of production favoured by business”.

The well-meaning government initiatives of the now defunct GEAR (Growth, Employment and Redistribution) and the current ASGI-SA (Accelerated and Shared Growth Initiative of South Africa) have failed to make any significant impact on ameliorating the plight of those in the ‘second economy’ (Frye 2006, 1, 3). The latter are seen to be a burden on the system wherein attempts at ‘distributive justice’ through taxation have failed to offer redress. South Africa would do well to emulate other majority world contexts enabling their people to capitalise on what Prahalad (2005) describes as ‘the fortune at the bottom of the pyramid’. This would be a more sustainable option, instead of the present practice of relying solely on the profits of the so-called ‘first economy’ to eradicating (or at least reduce) poverty. Prahalad (2005, 7) points out that wealth creation is more sustainable as an economic policy strategy than ‘distributive justice’.

To effectively target poverty in the context of design for development, there is need for a multi-dimensional view of sustainability - economic, environmental, social, and institutional (Thomas 2006). Further, designing for poor markets requires far greater technological innovation and sophistication than one would expect for the so called ‘richer’ markets (Prahalad 2005; Thomas 2006, 57). Design for development requires fresh strategies for intervention (Thomas 2006; Margolin 2007). Such strategies would benefit from an integrated holistic and multi-dimensional economic development plan- one that believes in the creative potential of its entire people. A creative and empowered people are more likely to co-create their own futures.

The FabLab vision on design and innovation intrinsically supports this premise and the need for proposed interventions to be context-responsive taking cognisance of people’s aspirations. Whiteley (1993:119) further argues that “a product or process which does not grow out of the habits and customs of a country or region is unlikely to be successfully integrated into the society’s culture”. *The New Model of Socially Responsible Design* (Davey *et al* 2005) locates the design agenda at the core of all public sector engagement. Davey *et al* (2005, 2) define SRD as “the use of design to address social, environmental, economic and political issues” and further argue that “SRD interventions, whether focused on the individual or wider society, move beyond economic considerations to embrace ethical, emotional and humanitarian values”. The geopolitical realities in South Africa (and indeed on the rest of the continent) demand a more

proactive grassroots approach to design activism if the quality of life for the vast majority of its peoples is to be enhanced.

To catalyse the expected growth of creative communities, locally pertinent concepts such as *ubuntu* - a home-grown concept of mutual support and communal solidarity (Boon 2007), and *batho pele* (literally meaning '(putting) people first') lends themselves readily to an anthropocentric ideal. *Ubuntu* variously means: "morality, humaneness, compassion, care, understanding and empathy" (Boon 2007, 25); or "humanness" (Fick 2006, 168). Boon (2007, 3) believes that in embracing *ubuntu*, Africans celebrate their cultural diversity and "a vision of harmony, prosperity and success". *Ubuntu* can be viewed as the impetus to create new forms of elective communities of like-minded people sharing a common vision.

Designing in a complex environment often presents a blend of seemingly insurmountable challenges alongside historic opportunities (Thackara 2005). Johansson *et al* (2005, 977) propose a vision of 'distributed economies' that would ameliorate the above scenario by "introducing and making proper use of a collective team spirit where improvements will be shared by a collective community that has familiar ambitions and values". This would ensure wealth creation by a larger number of people and strengthen the sense of community.

A vision of sustainability would have to take into account the potential of 'distributed economies' (as opposed to 'segregated economies') that effectively promote entrepreneurship and adopt labour-intensive production means, thereby stimulating innovation and creating sorely needed sustainable employment opportunities. The resultant economic empowerment and concomitant reduction in poverty (and related social ills) would make Africa a better place for all.

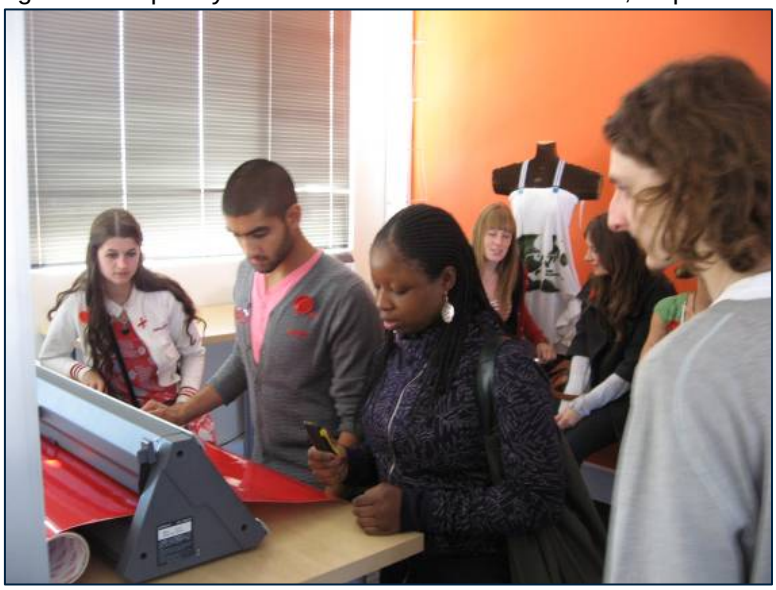
5. Advancing Participatory Innovation

Speed is not everything. There is strong evidence to show that slower, locally-situated, and need-based response strategies translate into more sustainable endeavours (Gershenfeld 2005; Johansson *et al* 2005; Manzini 2007a). The popular saying that "there is no hurry in Africa" could turn out to be a *really* good thing for a continent grappling with various developmental imperatives.

Elements of 'distributed economies' such as small-scale local production, are innately more accessible and promote economic diversity and sustainable development (Johansson *et al* 2005). Gershenfeld (2005, 16) also endorses quality over speed, and personal fabrication rather than mass production. Further, grassroots and participatory design initiatives empower people by helping them to take control of their own production, consumption and distribution means.

The opportunities and potential offered by the FabLab for all stakeholders are vast. Papanek (1995, 210) recommends that "design education should be introduced into nursery, primary, and secondary schools instead of limiting it to vocational and occupational studies at post-secondary level". Participatory innovation sessions at the FabLab (such as in Fig. 3) compliment this strategy by collaborating with community schools to expose young minds that are ripe for "discovery and self-knowledge" to innovative processes (Papanek, 1995, 211).

Fig. 3: Participatory innovation session at the FabLab, Cape Town



6. Conclusion

The central question that this paper addresses is whether Africa can 'leapfrog' into a sustainable future through elective creative communities such as the one described. The FabLab at the Innovation Centre of the CCDI has been in operation since June 2006. Given the relatively short time it has existed, we expect that the full impact will become visible when the students and crafters who presently spend their time in the FabLab realise their full economic potential. The effect of the collaboration between design students and crafters is already evident in the successful products the CCDI takes around the world on shows and exhibitions.

It is clear from the interpretivist perspective adopted in this paper that the FabLab infused with the spirit of *ubuntu* is a potent force to facilitate the kind of processes that are thought to contribute to global sustainability. As far as we know, the unique combination of the technologically advanced FabLab and handcraft sets a unique scene where the spirit of Africa can flourish and provide sustainable economic models within the changing world economy besides improving the quality of life for people living in their local reality. This approach, coupled with an inspired brand of design activism promises sustainable livelihoods for all involved.

The FabLab is a space where people from the two segregated economies can meet and work together as equals and learn from each other. The crafters are given an opportunity to experiment with advanced techniques. This often leads to improved and more consistent technical quality of their products which gives them an advantage in the market place through product differentiation. Through the use of open-source software products can be refined and new possibilities can be explored. The interaction with people from 'the other economy' gives the design students an expanded view and a better understanding of the world they live in and stimulates their imagination and creativity. The technology available in the lab has become the channel for communication between two worlds. The specific focus of the Cape Town FabLab on craft, through its link with the CCDI, has lifted its purpose of personal fabrication to social transformation.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Changing Perspectives on Design Education

The change in the design apprenticeship using the methodology of scenario building associated with sustainability concepts at the Universidade Federal do Rio de Janeiro (BRASIL)

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Abstract

This research's main goal and motive is to help find ways to improve design education in our university. It consists basically of an analysis of opinions of 71 students about their knowledge and apprenticeship of design and sustainability at the Industrial Design Undergraduate Course of UFRJ. It also aims to find out if the new methodology applied in the Product Project Development III (PPD3) class - scenario building associated with sustainability concepts (Manzini, 2003), which started in mid 2006, has changed the students' perspective on their role, as designers, towards the transition to world sustainability.

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1. Introduction

The issue of sustainability in design education is being broadly discussed by design researchers worldwide. There seems to be a general consensus that "[…] the transition towards a sustainable society will require a long and complex process of collective learning. A process in which every social actor will need to play a role, assume new responsibilities and acquire related new capabilities" (Vezzoli, 2003).

It is also well known that institutions of higher education focus on highly specific and specialized knowledge and skills, building upon what students learned previously. "Education for sustainability, however, cannot follow this 'normal' pathway because much of what students have learned in their previous education does not fit into the paradigm of sustainability." (Juárez-Nájera et al, 2005).

Therefore, we realize that "[…] there is the need for rethinking and transforming learning processes and dialogues" (Bergea et al, 2005). Reinforcing this line of thought, Second Nature.com, a website on transforming higher education, states that:

> "Higher education could have the power to lead in this endeavor by exercising its role in training future leaders, teachers and other professionals and in producing wisdom needed to face the challenges of an increasingly complex world. A transformative educational experience would be essential in creating the shift in thinking, values and action necessary for a healthy, just and environmentally sustainable society".

According to Manzini and Vezzoli in *La formazione di una nuova generazione di progettisti, L'architettura naturale: La cultura del progetto sostenibile*,1998:

> "[…] environmental issues have now penetrated society, education and systems of production. In particular, new educational curricula (with an overt environmental emphasis) for designers have begun to be developed and implemented. But this is barely a beginning. A whole new generation of designers still needs to be educated and employed. Designers have a crucial role to play in the radical change required to achieve a sustainable society and design educators must recognize this as a primary goal."

However, we need to recognize the difficulties encountered when trying to remodel values and thoughts of teachers and professionals of design, already so used to their own way of doing things, and, most of the time, reluctant in accepting change, especially the radical and internal ones. We must, then, start to understand the role of the students in this process of transformation of their education, and of society in general. "Educational campaigns led by students can result in significant energy savings by changing behaviors and purchasing decisions. Students are effective advocates on college campus, able to reach their peers and high-level decision makers" (Greencampus.com).

By any means, it is reasonable to conclude that both, instructors and learners, should try to work together in "modifying the educational process in order to emphasize active, experimental and collaborative learning and real-world problem solving in campus and in the larger community" (Second Nature.com). In this context, John Thackara states that "[…] active learning happens when we participate in projects that are meaningful to us and engage the real world. We need to believe that the task we are about to tackle is important and meaningful." (Thackara, 2006, p.

148). Design education, having, theoretically, a participative and meaningful character, should show its capacity to blossom the students' pro activeness needed to promote change. However, this is only going to happen when the design, or the choice of the project to be developed, is decided by teachers and students together.

According to Manzini, in his text *Design, ethics and sustainability*:

> "[…]as social actors endowed with specific design knowledge and specific design skills: the knowledge that enables them to understand the full, macro-picture of how things have changed (and are changing), and the micro one, of local context characteristics and on-going dynamics. They should use theses skills to propose solutions and/or scenarios; formulate effectively whatever emerges from the collective design group discussions; and develop the ideas on which partner convergence has been verified." (Manzini, 2006, p. 6)

This shift in their roles, the activity in partnership between those with and those without *light*, is the main factor that we must recognize to begin the sustainability march.

With this research, we intend to answer some issues about the teaching of sustainability in Industrial Design Undergraduate Course at UFRJ and its role in the change of the students' perceptions on their social-environmental responsibilities, as future designers:

- Does our University have an active role in the education of sustainability?
- If so, how and when does it happen?
- Does that happen because of subject PDD3 and its scenario building methodology?
- Does this apprenticeship really change the way students see themselves and their profession?

2. Methodology

Questionnaires

The questionnaires used on this research had 11 essay questions about design in general and about issues concerning sustainability and sustainable development. The students were required to answer the question writing 5 lines maximum, without consulting books, teachers or websites, and with no fixed time frame when answering them. The student participants had volunteered and could leave unanswered questions, for free will or ignorance of the subject. The questions used in this research were as follows:

1- In your opinion, what is design (product design)?

2- Why is this an important profession nowadays?

3- How would you explain the concept of Sustainable Development?

4- How would you explain the term Life Cycle Analysis of a product?

5- What does design and world sustainability have in common?

6- Do you know the area of design called (If so, explain it)

a) eco-design

b) design for sustainability

c) social design

d) universal design

7- Do you think sustainability should be a design specialization or that it should be integrated to all areas of design?

8- If you can, write down the names of 5 Brazilian designers that you consider outstanding professionals.

Each question was carefully chosen in order to fulfill a certain purpose. The first two, being related to the students' opinions, were meant to make them think about their profession and, therefore, were not included in the result analysis. The questions 3, 4 and 5 meant to check the students' knowledge on the new issue of sustainable development in the world and in design. The four questions of number 6 aimed to, at the same time, open freshmen's' eyes to the existence of such areas of design and to find out how many of them knew how to define those areas. On the seventh question, concerning the sustainability issue as being a specialty or not in design, being required a Yes or No answer, the objective was to obtain an statistical result, which could represent a sample from the design course students. That kind of information would be useful for the group of teachers that is currently studying design curriculum modifications. Finally, question 8, which posed the greater difficulty for the students, was chosen to show, even for the senior ones, how little they knew about design in their own country.

Besides those conceptual essay questions, it was required for the students to do a self-evaluation test of their knowledge on each subject by answering the question: "How well do you know this subject" by marking the space beside each question, in which the participant could choose between 'Well', 'So So', 'A Little' and 'Nothing'. It should be pointed out that due to the liberal characteristic of the present research, the students were allowed to leave questions unanswered. Although it is not possible to explain why some students had chosen not to answer certain questions, the blank answers were considered in the graphs' construction.

However, it should be emphasized that, as this research is being conducted by a senior student, tutored by her former PDD3 teacher, having the students do a self evaluation test counterbalances any bias on the result analysis.

In addition, although being given less importance, the main ideas of the answers were corrected (question 3 through 6d), being evaluated as 'Correct', 'Reasonably Correct' and 'Incorrect'. For the correction of those essay questions, conceptual answers worldwide known were established, as follows:

3- How would you explain the concept of Sustainable Development?

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (http://www.un.org/esa/sustdev/)

4- How would you explain the term Life cycle Analysis of a product?

Life Cycle Assessment (LCA) models the complex interaction between a product and the environment from cradle to grave. It is also known as Life Cycle Analysis or Ecobalance. If you want to be more precise, you need life cycle assessment (LCA) to quantify and balance the impacts of products. (http://www.pre.nl/life_cycle_assessment/life_cycle_assessment.htm)

5- What does design and world sustainability have in common?

Sustainable consumption questions, not only products and services,but also the way that needs and wants are defined and/or fulfilled. Within this framework, designers have an important role to play: They form a bridge between the consumer's cultural sphere and the world of production and they have the potential to be important actors in the product development process. (Manzini E, Vezzoli C. La formazione di una nuova generazione di progettisti)

Do you know the area of design called: (if so, explain it)

6a) eco-design

Ecodesign is a design management process which minimises the negative environmental impacts of a product, package or service while optimising its performance. (http://edcw.org/about-us/what-is-ecodesign/); *and The environmental impacts of Energy-using Products take various forms, such as energy consumption and related negative contribution to climate change, consumption of materials and natural resources, waste generation and release of hazardous substances. Eco-design, which means the integration of environmental considerations at the design phase, is arguably the best way to improve the environmental performance of products.* (http://ec.europa.eu/enterprise/eco_design/ecodesign.htm)

6b) design for sustainability

Designing for sustainability requires awareness of the full short and long-term consequences of any transformation of the environment. Sustainable design is the conception and realization of environmentally sensitive and responsible expression as a part of the evolving matrix of nature. Design for sustainability is closely linked to wider concepts such as sustainable product-service systems, systems innovations and other life cycle based efforts. (http://www.d4s-de.org/manual/d4sChapter01.pdf)

6c) social design

It's design for the greater good. Social design is design for everyone's sake. (http://www.design21sdn.com/design21/about) *or social design is sometimes defined as a design process that contributes to improving human well-being and livelihood. Social design thinking within the design world joins developing human and social capital with new products and processes that are profitable.* (http://en.wikipedia.org/wiki/Social_design)

6d) universal design

The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. (http://www.design.ncsu.edu/cud/about_ud/udprinciplestext.htm)

The 'correct' answers were those which resembled the standard concepts. The ones evaluated as 'reasonably correct' were those which captured the essence of the answer and the 'incorrect' ones were totally mistaken, misunderstanding terms (which was the case with Life Cycle Analysis of a product and Product Life span)

Participants

The research participants were 71 students from the Industrial Design Undergraduate course, Product Design, from Universidade Federal do Rio de Janeiro (UFRJ). The UFRJ Industrial Design course can be completed in a minimum of eight semesters, in 4 school years. It consists of a basic program in which the students are educated in drawing, art and model construction for one year. In the following 3 years, the students design one product each year in a subject called Product Design Development (PDD), which is accompanied by secondary subjects as

ergonomics, math, social sciences and model constructions, among others. This research concerns chiefly the students who have already taken the PDD3 course, in the fifth semester. In that particular subject, since 2006, a methodology in which concepts of design for sustainability has been applied, through scenario construction (Manzini, 2003). In order to enhance the perception of the importance of an active role, seminars are sponsored by older students, who have already taken the class and wish to spread out their knowledge to others. Hence, using methods like identity and scenario building (Jégou, 2007 and Manzini, 2007), storyboards, community research in addition to constant concern on friendly materials and processes, students then become conscious of their projects' value, importance and limits.

The questionnaires were given to students from several semesters throughout the course, in order to reach the student who had recently got into the university, the student who was taking the PDD3 class and the one who was in the process of starting his final graduation project. In order to find out how that particular subject could really introduce the concepts of sustainability on design students, we have decided to include also the graduating and recently graduated students, who did not have the opportunity to take the PDD3 course the way by which it is taught now, that is, emphasizing design sustainability. For sake of writing simplicity, we will refer to the group of graduating and recently graduated students only as 'Graduating'.

In total, 18 students from the first semester, 24 from the third, 7 from the fifth, 15 students from the seventh semester and 7 graduating students have answered the questionnaires. The main problem in getting greater similarity on the number of participants of each group resided on the unwillingness of the elder students to participate on the research, and also on the difficulty of finding them at the University campus or even on the internet.

Non-structured and informal data acquisition

As already mentioned, the second part of this research consists basically of an informal and random data acquisition on students' opinions about the education of social and environmental responsibilities of design in the curriculum of the course. Those data were collected in March and April 2008, by means of interviews, discussions and a round table at a design event, organized by students, called MegafônicasRJ2008.

3. Results

The results from the questionnaires were analyzed by observing bar charts obtained from the collected data (Fig. 1).

Self Evaluation

When comparing the self evaluation charts from different semester students, it can be observed that the older students feel safer about their own knowledge. Clearly, the first semester students (G1) declare they do not know most of the issues; the students in the middle of the course (G3) apparently see themselves as having medium knowledge on the questions presented, while the seniors (G5) found that they knew a lot on the issues brought up in this research.

This trend can be noticed visually by the prominent colors in the charts. While the light blue color, corresponding to knowing ‘Nothing’ about a subject fades away as the semesters approach the end of the course, the turquoise blue, which represents how ‘Well’ you know something, grows gradually until it is the dominant color in the graduating students chart.

Similarly, the colors burgundy and yellow, which represent, respectively, knowing ‘So So’ and ‘A Little’ of a question, show very interesting trends. Both reach their maximum by the middle of the course (G3 and G4) and decrease towards the graduating class (G5).

That result reveals clearly the objective of an undergraduate program, which is to prepare students gradually and systematically through the 8-year course. It should be pointed out, however, how trust grows among the students between fifth and seventh semesters. While the fifth semester students are still reluctant to admit the extent of their knowledge, the seventh semester ones seem more certain of their answers. This can be verified by the greater amount of “A Little” and “Nothing” evaluations in the fifth semester charts, while in the seventh semester graphs the “Well” and “So So” answers prevail, with very few “Nothing” answers.

In the results analysis, the “No answer” concept was not considered, since it would be difficult to figure out the reason for a blank answer. However, the “No answer” option was included in the graphs for statistical purposes.

About the Self-evaluation of the conceptual questions

The conceptual questions, from 3 to 6D, are related to the subject Product Design Development 3 and to the methodology of scenario building based on sustainability concepts. Therefore, it is important to consider those questions separately in order to evaluate the importance of PDD3 for the students, especially the ones taking it at this semester (5^{th} semester), the ones who took it a year ago (7^{th} semester) and the graduating students who took the subject when it did not focus on sustainability. Also, it is important to point out that the difficulty of the questions increase throughout the questionnaire, as there are more answers stating “A Little” or “Nothing” on the last questions, in all graphs.

When evaluating specifically those three last classes, some consistencies and surprises may be perceived. Some questions show an increase on the students’ knowledge along the semesters, as is the case of questions concerning the importance of design to sustainability and eco-design definitions. On the other hand, in relation to other questions, it seems there is no increase of information among the classes, demonstrating that all students found them difficult to answer. That can be apprehended by observing the charts maximum of each question. The questions 5, 6A and 6B show a clear knowledge increase throughout the semesters, inferring that eco-design is being relatively well discussed at the University; whereas questions 3, 4, 6C and 6D show hardly any knowledge growth among the classes. Concerning questions 3 and 4, statements of “A Little” and “So So” are more commonly found, showing the difficulty in defining specific terms as Sustainable Development and Product Life Cycle Analysis. Finally, in respect to questions 6C and 6D, the majority of answers stated “A Little” in almost all classes, except for the sophomores, in which the concept “Nothing” was prominent, showing clearly a lack of discussions related to some areas of design such as social and universal design.

About Self-evaluation of question 1 (In your opinion, what is design (product design)?)

This question refers to the students' personal opinion on product design, so it is not related to the subject PDD3 or to its methodology, but to the design course as a whole. Since the way one defines design cannot be corrected by a third party; the question can only be evaluated through the self-evaluation point of view. In this case, the results are consistent, as the unawareness on the subject decreases throughout the semesters. It is interesting to emphasize anyway that even the students who have been 2 or 3 years at the university find it difficult to safely draw a concept on their profession. That fact is shown by the predominance of "So So" concepts in all charts, except for the graduating students who answered "Well" more often.

About Self-evaluation of question 8 (If you can, write down the names of 5 Brazilian designers that you consider outstanding professionals.)

This question is also not related to the subject PDD3, but to the personal capacity of each student to be updated about their profession, to identify new tendencies and who is the leading team of professionals in their own country. The results of the question show a clear lack of awareness about design out of the university campus. The charts show a little increase in knowledge thru the school years, but in a very slow pace. Even the students who are probably already working could not mention names of Brazilian designers. Maybe this could be explained by the fact that people in Brazil do not really know what a designer is, and which are his attributions and activities. Very few magazines, papers and news on Brazilian design are published, causing an absence of models and examples for the students. Anyway, it is an issue which will need further investigation.

Hetero Analysis of the Essay Questions

This analysis has shown basically that the graduating students have scored more right answers than students from other years. There was also a great increase in right answers between the fifth and seventh semesters, but there was no such increase between the students of first and third semesters.

The behavior of each class was analyzed through the charts G6 to G10, by observing the concept with the greater percentage in each graph. For example, the question 6A, about eco-design, probably one of the easiest questions due to the great disclosure of the subject at the university and in the design world itself, has reached the greatest percentage of "Correct" in classes of first, fifth, seventh and graduating semesters (shown, respectively, in graphs G6, G8, G9 and G10) and "Reasonably Correct" for the third semester class (G7). Observing the graphs, one could verify that the "Correct" concept clearly increases thru the semesters, being the greater percentage only 3 or 4 times in the graphs of the first 3 classes, and scoring 7 times in the last 2 classes. Whereas the concept "Reasonably Correct" decreases throughout the years, not being found in any of the questions of the graduating class. It is interesting to point out that the concept "Incorrect" is very seldom found in any of the graphs. This is explained by the fact that most of the students would prefer to leave a blank answer than taking the risk of getting it wrong. That is why we could not find out which was the most incorrect of all the questions answered. The only question in which there was at least one mistake in each class was about Sustainable Development. Additionally, only twice the concept "Incorrect" surpassed the others in one question. Those were the cases of Sustainable Design for the 3rd semester and the question on Product Life Cycle Analysis for the sophomore class. Both cases could be excusable since those concepts are not discussed in the subjects in the first two school-years of the course.

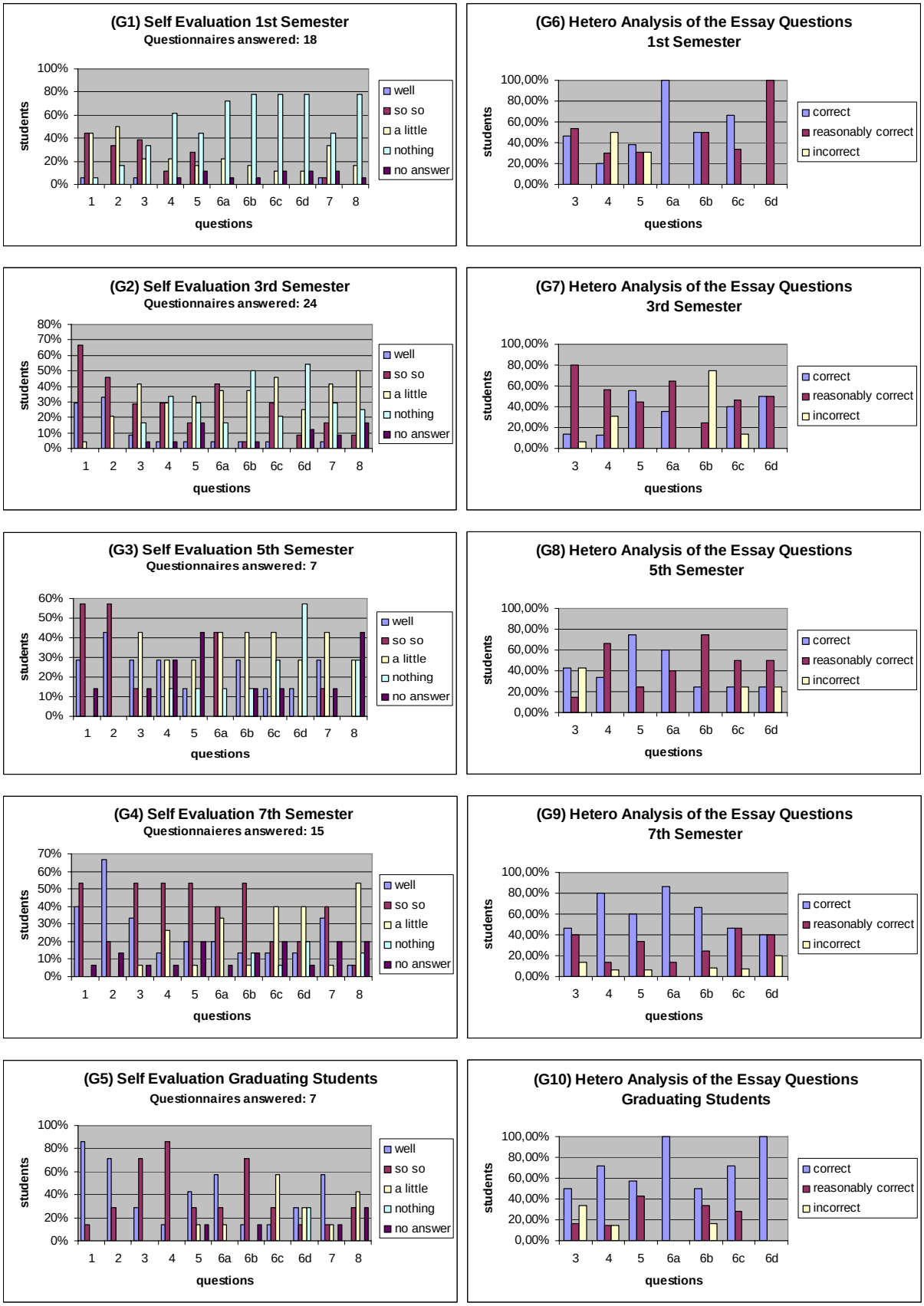

Fig. 1: Self Evaluation and Essay Questions Analysis Graphs

Informal Data Acquisition

When the students were questioned about the socio-environmental responsibilities of professionals and students of design and how those issues were taught at the university, the students' answers were quite similar:

- I know almost nothing about it. And the little I know is not enough to be used in my projects. There is a lack of those topics in our course at UFRJ.
- We know it exists, but it's difficult to use it in a design project. This is because there is not a specific subject about it. We hear more about it when we are taking PDD3, in the fifth semester.
- The environmental and sustainability issues should be natural in our profession because they belong to design. And it is not just a matter of materials, recycling, reusing – we should be studying everything that is involved.
- Of course, eco-design should be included in our curriculum. It should start from the beginning, since day one.
- Well, that was the first step, to know it exists and that it is necessary. Now, we need to start learning how to apply this in our life and our profession.

When asked about the results of the PDD3 subject and its methodology of scenario building, they answered:

- That subject made us look around. Instead of designing a specific product, we were supposed to design it from the environment point of view and not from just a need, that is, to see the necessity from the environment. In other projects, you picked a product, or the teacher chose it for you, and you saw through the particular product what was necessary to be done. You didn't see the environment and decided what to do from it.

- I thought that the methodology focused on the user, and not only him, but on his activities. The product was focused in an integrated way. The other methodologies, in other product design subjects, were not focused on the user. You thought about him at one moment, but not in the context of the environment of that product, so it was all very loose, things didn't relate to one another. The scenario methodology creates a link between the elements. I intend to adopt that methodology because I think it is richer in possibilities. To learn that was very good. Now, for me, sustainability and design are inseparable. But this awareness came a little too late; I would be grateful if I knew about it in the first semester.

- Designing a project based on the construction of a scenario, reaching a target problem and, from that scenario, create a new product was interesting. I thought it was cool to make a scenario first, because it indicated a certain way to make a product, it was not making it without a purpose. There are other subjects with some ideas on sustainability, but in PDD3, it was more emphasized during the classes. This has changed my way of thinking and believing. Before, I knew nothing and thought I knew. Now, I know that I don't know much and that is a step forward. I know how big the problem is and how difficult it is to find a solution. Sustainability is today my main objective in life. I am going to use this concept in everything I can, not only in relation to design, but to everything.

From those examples, one can see that it is almost unanimous the unawareness on the issues of sustainability and the need to have it more disseminated in the design university course. Although it might seem that those opinions were chosen just to show this tendency, in reality, almost all students have demonstrated the same worries. Something that would corroborate to this assumption is the fact that from the 56 students who answered the question "Do you think sustainability should be a design specialization or that it should be integrated to all areas of design?" 54 stated that sustainability should be integrated. Answers like "It should be integrated to all areas of design. Concerns about the future of our resources and our planets is a feeling one should always have, independently of motive, being related to design or in any other situation." or

“Integrated to all areas. They should brain wash all students in that matter because people must convince themselves of the importance of their actions and realize how they affect the environment and how the environment affects them.” were very frequent.

4. Conclusions

From the data analysis above, it is possible to draw up some conclusions on the teaching of sustainability in the industrial design course at UFRJ and its implications on the students’ opinions. It is clear the design course at UFRJ fulfils its purpose of educating students over the school years, as there are not many inconsistencies in relation to a greater knowledge of the students in the last semesters if compared to the initial course students. In most cases, the graduating students evaluated their knowledge about design and sustainability as satisfactory, as well as having been well graded on their essay questions. Notwithstanding having presented some misconceptions on certain issues investigated in this research, it was evident that the course is capable of bringing up design professionals relatively up to date. When comparing the students who are taking the PDD3 class, the one who have taken it and the graduating students, who had not taken PDD3 with the sustainability approach, it was difficult to understand the origin of the differences of results in those classes.

Probably, for the students who are taking the class now, everything is still very new and the concepts had not yet settled down when they answered the questionnaire. Those who had taken the course a year before (7th semester student) had possibly got an internship to work in the area, attended seminars on the subject, having thus more chances to study on their own and to use their knowledge in their work. On the other hand, the graduating students, who never studied through that approach, maybe learned it another way. Although it is hard to identify which, one could imagine that the graduating students who volunteered to answer to our questions would be those who, coincidently, were the most interested in the area and that is why they had chosen to participate in a research of interest to them.

Anyway, one may point out some deficiency in teaching of specific areas of design and sustainability. Because industrial design at UFRJ has an artistic background, being part of the School of Fine Arts, and also a technical one, approach used by most teachers, few are the moments in which the students are confronted with themes like social design, universal design or design as a product-service system. Besides, even eco-design and other concepts of sustainability are still viewed by some influent professors as inferior and hippie approaches.

In spite of this, it was possible to observe, mostly by the informal data acquisition, a growing movement from the students, recognizing the need to discuss those questions more often and, most importantly, the need to include them in the curriculum of design course. It can also be concluded that, although there is great awareness, at least among the students, about the importance of teaching sustainability, sustainable development and eco-design, it is not clear how to put into practice those ideals.

Therefore, about the issues this research aimed to answer, one could sense that the university’s role towards sustainability education is only partial, since most of the knowledge is being searched elsewhere; the subject PDD3 has achieved its purpose of modifying the students’ perception, at least on the importance of studying those issues in this profession. Unfortunately, it was not possible yet to evaluate how much of this knowledge is modifying the perception of the students about themselves and how it is affecting their relation, as designers, with the world in the direction towards sustainability. Anyway, we must recognize that the first step has been taken;

however, in order to conceive designers more conscious of their role in this transition period, we must walk faster now.

Again, we should emphasize the relevance that co-design has in this process, reminding that its main issue is to go from fulfilling consumer needs to identifying user demands (EMUDE project). In this context, Dr. Mark Brietenberg, in his text on Interdisciplinary Innovation, questions himself on:

> "How can we plan in advance to insure the best possible collaboration among students and faculty? […] Interdisciplinary design projects can be exciting and rewarding experiences for students, offering new ways of thinking and the potential to produce innovative outcomes. Rather than simply putting different faculty and students in the same studio and hoping for the best, it is necessary to think of the project as educational experience design, where we apply the same research, processes and validation we use as designers."

We hope, then, with this research, to have come closer in understanding the ways we can design our educational experience in order to further the limits of reach of the students towards the faculty's, and vice versa.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Product Design Influencers and Triggers in Micro and Small Enterprises in Kenya

Case Study of Sofa-makers in Gikomba Market, Nairobi.

Lilac Osanjo[1]

Abstract

Key words: Design process, micro and small enterprises, design based research

Products consumed by the majority of Kenyans are produced by the micro and small enterprise (MSE) sector. The MSE sector is important to the economic development of the country because they supply goods and services to most of the population. However, MSE products have inherent weaknesses that include poor product quality and inappropriate raw materials. Designers are concerned about these poor products. However, focus on gaps in the product design process has not impacted on MSE design practice. This research takes a different path and focusses on the entrepreneurs who are the producers. The purpose is to establish the factors that influence design in MSE entrepreneurs with a view to improve the quality of products by embracing modern design concepts.

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1 Background to the Problem

Good products promote healthy, efficient and ecological lifestyles and are a result of sound design practice. Today, people require products that make them feel and look good. Within the home environment, furniture that includes sofa reflects the personalities, tastes, and financial status of their owners (O'Neill 1971: p 23-24). Furthermore, sofas are focal points used in identifying and positioning other furniture in living rooms. Sofas have their origins in Europe and spread to African countries during the late 19th Century. Today, nearly every urban household has sofa and the demand for them continues to increase.

Design is intertwined with quality of life in that it manifests itself in products, fashion, food, drugs and other things that we use everyday. There are many working definitions of design many of them specific to fashion, graphics, interior or other disciplines. The Oxford Dictionary uses words such as purposeful, artistic, skillful, conception, invention, planning, sketching and *opposed to chaos* to define design activity. Because of its relationship and interdependence with quality of life, design professionals have been challenged to champion and provide leadership and embrace design concepts (Vil-Nkomo 2006, and Viljoen 2006). And, today design concepts are anchored on sustainability; in the 1990s the Hannover Principles stressed the need for design that was *ecologically, economically, aesthetically and ethically responsible* (McDonough 1999). Other design concepts include Design for the Real World advocated by Papanek (1972) and the Appropriate Technology movement of the 1970s. With increased competitiveness and Globalization, companies large and small, public and private are more aware of the need for design. Unfortunately, both large and small companies do not pay enough attention to design research and process (Donaldson 2006 p 143). The micro and small enterprise sector producers particularly, seem to be highly profit driven at the expense of acceptable design practice.

Micro and small enterprises (MSEs) are economic entities employing between one and fifty workers per enterprise. Micro enterprises employ up to ten workers while small enterprises employ up to fifty workers. The business activities of MSEs include trade, service provision and manufacturing in both rural and urban centres. Between 1993 and 1999 the MSE sector recorded an average growth rate of 7% according to the MSE Baseline Survey. Out of a total of 1.3 million MSE, 13.4% were engaged in manufacturing, 64.3% were engaged in trade, another 14.8% were in the service sector and 7.7% were engaged in other activities (ACEG 2005 p 1). In the ensuing years, the MSE sector continued to record growth although in 2008, the growth rate may have been affected by campaigns and political unrest. The MSEs contribute substantially to the economy because entry into the sector is relatively easy: the sector provides goods and services that support agriculture that is the mainstay of Kenya; it provides employment in both rural and urban centres - 74.2% of the Kenyan labour force (ACEG 2005 p 2), serves to arrest rural to urban influx of job

seekers, supports medium and large enterprises and is a breeding ground for the small and medium enterprises.

The growth of the MSE is not without problems in regard to policies that are poorly formulated; the legal and regulatory in which some existing laws and regulations impede growth; limited access to financial services; a weak environment for co-ordination and transfer of technology and low demand for goods and services due to dumping and overproduction. MSEs have a limited access to relevant marketing information and their competitiveness is weak due to poor product quality, packaging, advertising and distribution (ACEG 2005 p 6). In response, the Government of Kenya has set out to formulate the Micro and Small Enterprise (MSE) Act that will provide the legal framework for the implementation of MSE policies. Strong MSE Sector Associations have been proposed that can lobby government on MSE needs, supplement efforts in training, marketing, technological development and transfer, information collection and dissemination, environmental management and provision of other support services.

Poor quality products from MSE have been attributed to training, lack of information, and competition among other things. Professional designers attribute poor products to gaps or oversights in the product design process. Donaldson (2006 p 152), attributes the poor products to poorly defined needs at the initiation of the design process. MSEs derive designs from five sources that includes imitation of foreign-based products; imported designs; original basic design and specialty design. Nearly all products purchased by the average Kenyan consumer are imitations of foreign-designed products (Donaldson p 152). From observation MSE sofas are no exception and are reproduced from European sofas. In the process of reproduction MSE entrepreneurs fail to infuse design and thereby create sofas that are flawed.

This report is compiled after the first phase of research into the MSE sofa design practice. Case study approach was the main research method (Yin 2003) because of the need to capture as much baseline data as necessary. Data collection was undertaken through observation using field notes, photography and sketches. In-depth interviews covering diverse topics were conducted. Each enterprise was visited at least three times on average and each visit lasted one hour. During the field visits, customers who came to make orders were interviewed. Secondary data was complimented with information from experts and government officials. Experience with MSEs at different levels provided useful insight into the research approach. Qualitative data collection and analysis was found to be most appropriate for this phase. However, quantitative methods that include semi-structured interview guides and questionnaires will be designed for the next phase of research.

1.2 Research on MSE product design

Research into the reasons and causes of poor products from MSEs has been undertaken by economists, social scientists (Donaldson 2006, Ngethe and Ndua 1996 and Abuodha, 1995) and design professionals (Mwasi 2006, Onyango 2003 and Osanjo 2003). Omissions and gaps within the product design process has been the focus for research.

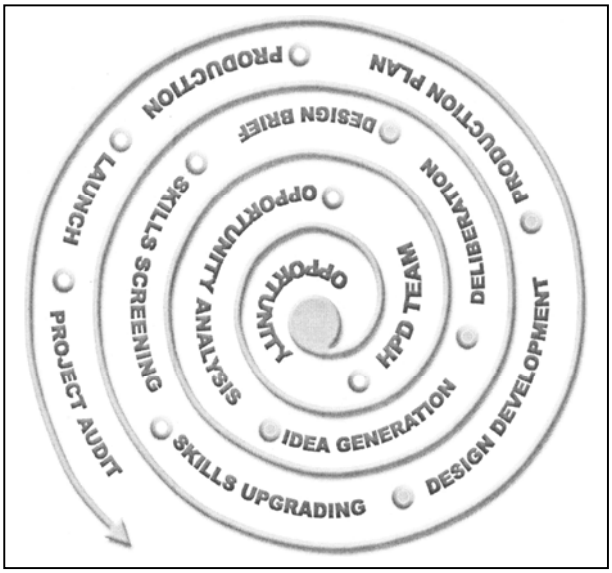

Figure 1: Hybrid Product Design (HPD) Method

Source: Mwasi (2006 p 3)

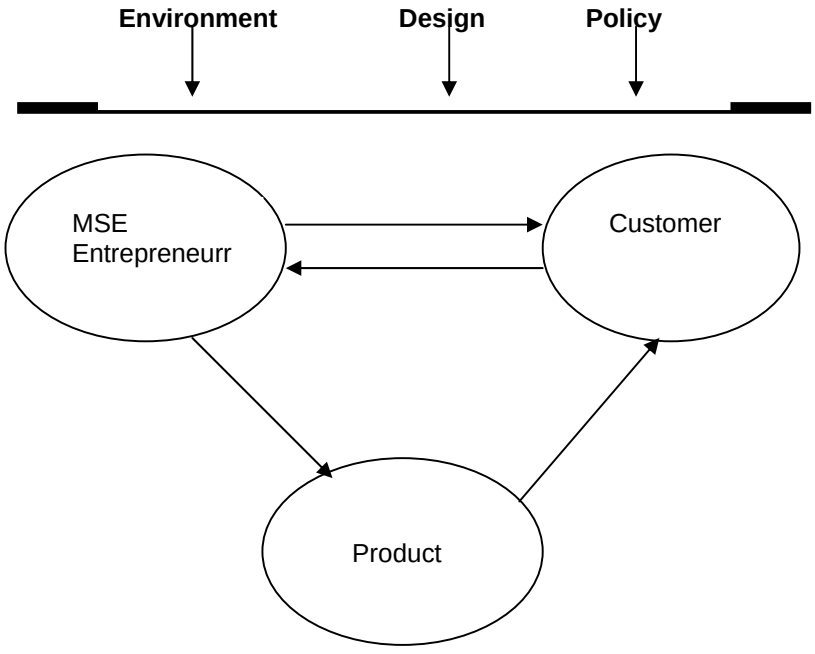

Figure 2: MSE product design environment
Source: Osanjo 2008

This has always led to a proposed product design process. Donaldson (2006 p 136) in his case, for example, used David Ullmans' mechanical engineering design process as a point of reference for MSE product design. And yet, we know that It is difficult to equate the MSE product design process without clearly identifying the parameters. While MSEs operate at the middle and lower income group levels of the population, mechanical engineering and professional design practice are both undertaken at a higher and more sophisticated market strata. The proposed Hybrid Product Design (HPD) method proposed by Mwasi (2006) and outlined in Figure 1 exemplifies the MSE product design problem. The HPD method highlights some of the issues that underlie MSE product design research. The method is based on shared responsibility as shown by the constitution of a *design team*. Yet, it is known that one of the characteristics of the MSE sector is that they have less than 10 employees who have minimal technical skills. Within the furniture making, the entrepreneur wears many hats at the same time; they are the artisan, manager and marketer- essentially making them a *design team* that is essentially a one-person team. The HPD method is elaborate and requires design skills for successful implementation. These design skills, the MSEs do not have (Abuodha 1995 p 45).

The present MSE product design practice shows a market system in which the MSE entrepreneur and customer share information and trade in sofa without consideration for design, the environment and any Global trends. The dis-connect between stakeholders and MSEs product design practice is illustrated by the thick black line in (Figure 2). One of the objectives of this research is to establish whether or not this is the case for MSE sofa designers.

This research deviates from the poor product as a unit of analysis and focuses attention on the MSE entrepreneur. The purpose of this research is to determine the ability of MSE entrepreneurs to design acceptable sofas that will answer to the needs of the people, the designers and the world at large.

1.3 The Problem Statement

The research problem that is being addressed is that products from MSE are characterized by poor quality. The MSE chairs are unstable and easily fall apart, the wood and raw material used is of poor quality (Donaldson 2006, Onyango 2003).

- There is little research on design in Kenya, and no in-depth study has been undertaken on MSE entrepreneurs who create the products. The design based research so far undertaken by design professionals focus on MSE product design process and not enough attention has been paid to the entrepreneur.

- There is no framework for appropriate MSE product design practice that engages design in the process. This framework will begin to breakdown the barrier that prevents entrepreneurs from embracing design.

The concern on how to tackle this research problem invariably directed the research at MSE products that are widely consumed and that have not received much design attention – the sofa. Sofa making is undertaken in all urban centres but this research was based in Nairobi because of the concentration of sofa makers and the convenience for back and forth movements during this phase of field work. Gikomba Market was the selected site because it is a major source of sofas for the middle and lower income earners in Nairobi and that represents a substantial market.

1.3.1 Gikomba Market

Gikomba Market is situated to the Eastland of Nairobi (Figure 3) that is inhabited by the middle and lower income earners. The market is the source of various goods and services including fresh food produce into and out of Nairobi. Sofas and other furniture activities are tucked away on the banks of Nairobi River that passes through the market. The open space is dotted with electric woodworking machines such as lathes and band saws (Figure 4). This type of activity gave rise to the famous "*Jua Kali*" (Kiswahili word for *hot sun* in reference to the open air work space) identity for MSEs.

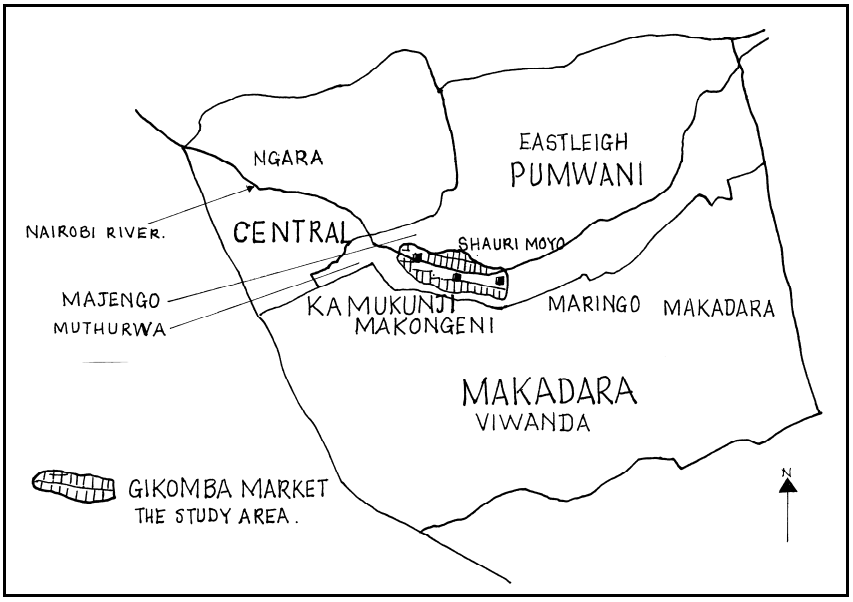

Figure 3: Closeup sketch of Gikomba Market – the study area.

Figure 4: Artisans working on sofa frames within Gikomba Market.

1.3.2 Gikomba Sofa Making

Sofa making in Gikomba Market can be traced to 33 enterprises that produce an average of 8 five-seat sofa sets per day. This translates to 264 sofa sets each day from all the enterprises. Each month, the enterprises produce 5990 sofa set frames. The frames sell between $84 (Kshs 5,000) and $50 (Kshs 3,000) per each depending on style and wood used. The sofa styles change periodically and the sofas bear names that reflect political, social or other environmental phenomenon. The economic significance of sofa making is that on average, the entrepreneurs have a turnover of $2.9 million (Kshs 17.9 million) per month between them.

Sofa making is a hierarchical or pyramid activity in which there are three individuals who have design advantage over other entrepreneurs. This group of three is what this research identified as *cell* members. Operating mysteriously, the *cell* members are difficult to identify on casual observation. Most of the MSE entrepreneurs belong to the second and third group of entrepreneurs who are the carpenters and the "*hammer and nail*" group. These are individuals who have the technical capability to piece together wood to make sofa frames.

2 Preliminary Findings

Data collection from Gikomba Market is very challenging because of insecurity, the nature of MSE activities and Gikomba Market itself. Some of the materials such as Mahogany wood that the entrepreneurs sometimes use are illegal and therefore, they do not want to release information that is discriminating to their activities. Sofa making has rapidly expanded and presently, a single sofa can pass through at least seven micro enterprises before completion. Each enterprise makes design decisions that affect the overall design. The role and effect of these enterprises will be investigated in the next phase of research because it is difficult to determine who is responsible for the design flaws in the MSE sofa. Over a period of six months, the research has been able to identify the *cell* members and compile the following data.

2.1 Cell Members

The *cell* members are the single most important to any changes in sofa design process that involves Gikomba Market entrepreneurs. An in-depth case study of each of the *cell* members was undertaken including Mutei who is shown in Figure 5. *Cell* members are owner/managers of their enterprises and several others that are rented out. They have been working within the Gikomba Market for between 17 and 20 years. They are all technically able to replicate sofa design from pictures or shop windows. The *cell* members own heavy duty machinery such as lathes and band saws and have an average of 8 permanent employees. *Cell* members engage in apprenticeship training for individuals who wish to enter the sofa making industry. They are also officials of some of the

Welfare Associations that operate in Gikomba Market such as the Gikomba Jua Kali Association. Investigation covered aspects of their lives, education, motivation, and insight into sofa design (challenges and opportunities). Most of the information gathered so far in this research was provided by the *cell* members.

Figure 5: Mutei, one of the *cell* members, at his work station.

Source: Osanjo 2008

Figure 6: Buffalo sofa design from the MSEs in Gikomba Market.

Source: Osanjo 2008.

- *Education*: All *cell* members are secondary school drop-outs, forced out of school because of lack of school fees due to the death of a parent or the effects of poverty. One *cell* member was lured out of school by his uncle who was working within the furniture sector and promised training and employment.

- *Training*: *Cell* members underwent apprenticeship training for between six months and two years within medium furniture making firms before starting out on their own. Training covered all aspects of carpentry, management, Art and Drawing. They do not have certificates for the training. The third cell member inherited his uncles' workshop after training and working with him.

- *Motivation*: The knowledge gained and the money they earned from their labour was strong motivations for the *cell* members to stay on

and expand their business. It has never occurred to them to leave Gikomba Market and venture into any other business. The returns on investment have been good and the profits have enabled them buy vehicles, land and open other outlets within Gikomba Market. They work in Gikomba Market every day unless there is a good reason to be away.

- *Marketing*: The *cell* members do not engage in marketing activities but their businesses continue to grow mainly due to customer referrals and consistent presence over a long time.

- *Sofa Design*: According to the entrepreneurs, everyone needs to look at his or her interests in the sofa. It involves two people - the consumer and the entrepreneur. The consumer wants to save something on the *price*, and the entrepreneurs want a reasonable *profit*. Pricing can take one of three forms; *high price* for those who cherish value and uniqueness, the *fair price* that is charged to most customers (this is the customers preferred price), and "*special customer*" price (a price charged according to the individual customers' special needs).

2.3 The causes of bad sofas from MSEs

Asked to specifically outline the issues that affect sofa design and production, *cell* members stated that:

- most entrepreneurs do not value standards;
- European dimensions are not adhered to by the entrepreneurs;
- entrepreneurs do not value their customers and
- entrepreneurs use wet wood in making furniture frames-*often knowingly*.
- The premature break away from apprenticeship training also causes the entrepreneurs to produce bad sofas.

2.2 Sofa style selection

Sofa style selection is the responsibility of the entrepreneur and the customer. Ideas come from customers, pictures and shop windows. Table 1 shows the source and highlights the issues that arise from this style selection method.

No.	Source of Idea	MSEs	Issue
1.	Customers	The customer explains and entrepreneur sketches. Entrepreneurs reproduce the sofas that customers want without questioning.	What the customer wants may not be what is appropriate for them. Customers are mostly limited to what they can see and find in Gikomba Market.
2.	Observation from display and shop windows.	The customer identifies the design they want from a window or shop display. The entrepreneur is then taken to see the design and asked to replicate the sofa.	In the process of replication the entrepreneurs may not have the material or adequate resources to undertake production. Especially because they are charging up to 3 times less than medium and large shop prices.
3.	Journals and Magazines.	The entrepreneur collects journals and magazines from the big stores and newspapers.	Their source of design ideas is limited to what they are exposed to.

Table 1: Sources of sofa styles

The MSE sofa *design team* of the customer and the entrepreneur agree on details, discuss price and production starts. The issues in Table 1 arise because of the *design teams'* limited sources of ideas and design. The importance of customers in the sofa idea is consistent with observations made by Donaldson (2006 p 139) who observed that MSE product manufacture began with *ill-defined needs*.

2.3 Customers role in MSE sofa design

MSEs depend on customers who come to them. This is consistent with other researchers (Donaldson 2006, Onyango 2003 and Osanjo 2003, 1994). A randomly selected sample of fifteen customers who were found in Gikomba Market were asked to state what they were looking for in a sofa, 10 out of 15 customers said they wanted the "*new design*" implying what was in fashion, 4 of them were looking for "*they could afford*" while the rest were open to suggestions from the entrepreneur. From this it can be concluded that MSE customers are concerned about "*fashionable sofa*."

Customer preference dynamics is illustrated with the Buffalo Sofa (Figure 6) that is one of the popular and fashionable sofas. Although copied from a magazine, it is re-named Buffalo after the wild animal because of the “horn like” stuffing running on the back rest. The price range is between US$250 to US$1,000 for a 5-seater set. Even at the higher price, the MSE Buffalo sofa is three times cheaper than a similar “looking” sofa bought from a medium or large outlet.

- ***Fabric selection***: Fabric selection needs careful scrutiny because fabric is available in its original form, and a cheaper version that uses mainly plastic material is also available. Whereas the prints for the fabric look exactly the same, the “feel” is different. The customer can opt for the more expensive, longer lasting, value guaranteed fabric but, more often selects the cheaper version mainly because they all look the same.

- ***Names or identity***: Sofa preference by customers can be influenced by name given to the sofa style. Political names such as Lucy (named after the wife of the President) appeals to some customers. ODM (named after the Orange Democratic Movement-one of the local political parties) has been a popular sofa with certain customers especially during campaign period.

- ***Comfort***: Comfort is not a major concern for customers. Asking customers to take a seat on the sofas that were on display in the showroom during field work, it was observed that customers do not pay attention to the comfort in the seating process and sitting posture. All the fifteen customers trusted that the sofa was good. Either that or the customers had faith in the entrepreneur to produce an appropriately comfortable sofa without stating the need explicitly.

3 Stimulating acceptable MSE design practice

Stimulating acceptable design practice is a factor of identifying the influencers and the triggers that are in existence and providing ways of infusing acceptable practice into the system. Experience can be drawn from other MSE programmes such as entrepreneurship. Stimulating entrepreneurship in MSEs, Gibb (1988 7a) suggested bottoms-up systematic approach that involves MSEs themselves identifying opportunities that support and motivate them. This approach guarantees commitment of the MSEs to the selected course of action. This entrepreneurial approach is often best done by non-governmental organizations led by individuals or groups capable of making things happen. Implementation involves formation of small business associations, local trade associations, sector groups and business cooperation of all kinds. Small business networks at local level and linkages with professional components of the environment including designers and trainers, will build them to be major industry leaders (Gibb 7 b). With this in mind, this research reexamines some of the enablers or influencers that can form a basis for improved MSE design practice.

3.1 Apprenticeship training

The *cell* members provided an outline the ideal growth path for a sofa entrepreneur entering the MSE sector. The average age of individuals entering the MSE sector is estimated at 14 years. For the first two years they should be directed by a *master*, this can be a *cell* member. During these two years they undertake small projects with the *master,* this includes cutting wood, familiarizing with equipment, safety and general duties. At the end of the two years, the trainee graduates to an apprentice and begins to earn some wages. As an apprentice, they should take some responsibility for their activities and they can begin to understand workshop management, pricing and sourcing of materials. After this stage they can be absorbed fully into operations. This process is very similar to the present informal apprenticeship training in Gikomba Market that takes between three and six months. During apprenticeship, the trainee pays a fee of about US$30 (Kshs 2,000) per month. The entrepreneur-to-be should not be in a hurry to wean-off his *master*. This is the critical stage in the development of the entrepreneur in so far as product design is concerned. Premature weaning, forces entrepreneurs into meeting "survival" needs and thus starting their own enterprises. In the process, they set the stage for bad sofas. Inferior quality of products is an outcome of artisan's limited skills and access to tools and machinery that Kabecha (quoted by Donaldson) refers to as "*product-process mismatch*" (Donaldson 2006 p 19).

3.2 Associations

Within Gikomba Market there are several associations mostly addressing welfare issues. The Gikomba Jua Kali Association is the largest with an average of 70 members. The association was set up to promote the growth of the members by providing training, marketing opportunities (such as product exhibitions), access to finance and other government support. The association however, has been riddled with problems and most members have fallen behind on payments.

3.3 Non-governmental organization (NGOs)

NGOs are well placed to facilitate product design and development as they have resources, access to modern technology and information (Donaldson 2006 p 146). In the case of furniture makers in Migori (1995 p 45) in which I was involved, the micro and small entrepreneurs were mobilized into a cohesive group and made to identify their priorities for growth. Arising from this was the Jua kali workshop that was donated by Intermediate Development Group (ITDG). The workshop provides the entrepreneurs with access to heavy duty machinery that otherwise they would never be able to afford on their own. As a result, the furniture makers are able to turn and shape wood into appealing designs for beds, chairs and tables. Access to machinery and equipment can be said to contribute to improved product design.

4 Emerging issues for Design Based Research

The information so far collected begins to formulate into relationship that will answer the research problem at hand. The problem of this research fits well into what Rittal described as the *wicked problems of design.* Wicked problems are social system problems which are ill-formulated, where information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing" (*quoted from* Buchanan 1995 p 14).

Design based research focuses on the development, articulation and communication of design knowledge that is found in people, processes and products. Drawing from scientific and social research methods, design based research embodies, "*things to know, ways of knowing them and ways of finding out about them*," (Glanville, 1999, Cross 1999 and others). However, in complex systems, where there is relatively little data to build upon, it is difficult to separate and isolate variables. And the researcher is left to isolate the variables as part of the investigation. They are always present as active agents (Glanville 1999). Influenced by social, epistemological and other factors, the researcher, continues until the system begins to perform as desired or required into a pattern.

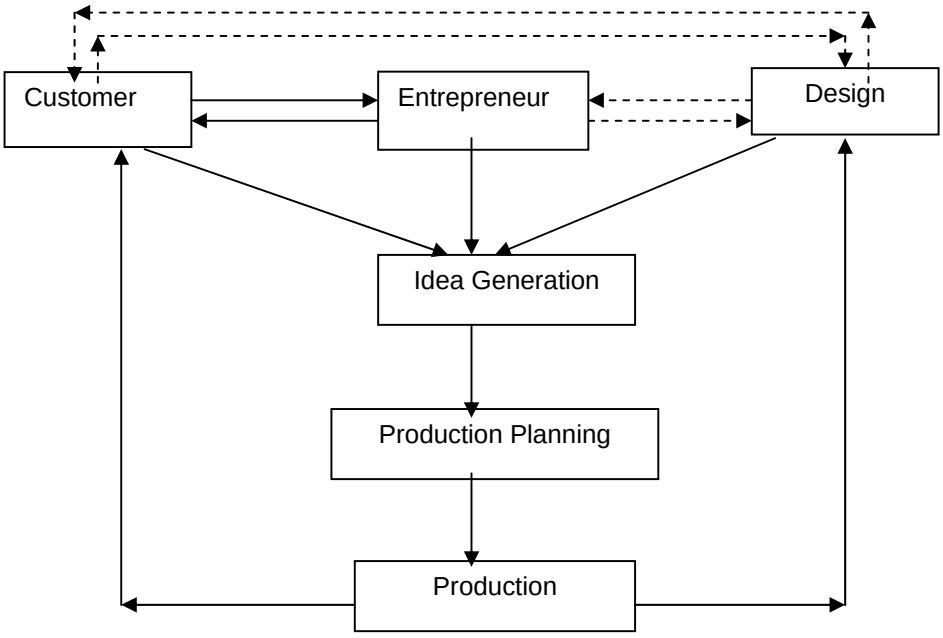

Figure 7: Framework for MSE design practice
Source: Osanjo 2008

The framework for MSE design practice (Figure 7) that is proposed for further investigation isolates design from environment and policy and places it at per with the existing *design team* –namely the entrepreneur and the customer. The dotted lines will replace the barrier identified earlier in Figure 2. Apprenticeship, association and NGOs will be explored as ways of infusing design concepts into

the design practice. Confirmation of data so far collected and instigating quantitative methods into the research by use of semi structured questionnaires and in-depth interviews are on-going. The research sample will also be expanded to include more entrepreneurs, NGOs, administrative officials, customers and design professionals.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design for disassembly and reuse for renovation of housing in Flanders

Case Study for existing (high-rise housing) buildings

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Abstract

Conventional existing building structures are not designed for change. Transformations in buildings, required to answer variable factors of the everyday life, often cause demolition of buildings. The enormous amount of waste produced during renovation and demolition processes causes serious environmental issues. The combination of disposal problems, pollutant impacts and the loss of materials and energy resources, requires building strategies taking life cycle design of building products into account. To increase the building's transformation capacity building systems have to focus on building systematisation and development of building methods providing adaptable structures allowing reconfiguration, reuse, or recycling. The aim of this paper is to specify decomposition characteristics of buildings, which determine the reuse potentials of the building in the framework of the existing building stock.

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1. Introduction

Production of daily used goods requires high amounts of finite resources such as petroleum products, rocks, minerals and fresh water. As the world's population is continuing to grow, the depletion of the earth's material and energy resources will continue to increase, leading to degradation of our natural environmental and human health. The building construction world is a sector that is responsible for a high contribution to the consumption of these natural resources. New construction, maintenance and renovation of buildings account for 40% of the total world's materials flows (Roodman and Lenssen 1995). It is even more alarming that barely 20% of the world's population, i.e. the richest countries, is responsible for the consumption of 86% of world's material resources (Fernandez 2004). Moreover, gradually the rest of the world is catching up now, causing even further environmental issues. Subsequently, the balance between nature and human activities can no longer be guaranteed. Building activities have clearly disturbed the rational consumption of our natural resources and of its equal worldwide distribution.

The high contribution of the building environment can be explained by the current static design applied in traditional buildings. Conventional existing building structures are primarily not designed for change (Webster and Costello 2005). Transformations in buildings, required to answer variable factors of the everyday life and changing society needs, usually cause demolition of building parts or even demolition of the entire built structure. An enormous amount of waste is being produced during these building processes and renovation interventions - an amount that is still increasing, as building activities increase over the years. As a result, for example, the construction and demolition waste in Flanders (Belgium) represents the largest fraction of the total waste disposal (EuroSTAT 2007). This tendency has been observed in several other European countries. In recent years, the proportion of construction materials being reclaimed and reused has been falling (BRE 2006). The combination of increasing disposal problems, resultant pollutant impacts and the loss of materials and energy resources, embodied in traditional building products even worsen this situation.

Bearing these problems in mind, do we continue to design in the same traditional way and do we keep on wasting precious materials possessing unexploited benefits by encouraging early recycling (down cycling) and landfill? Or do we think ahead and incorporate features into our design which would allow building elements to have optimised lifetimes by introducing reconfiguration of building structures, reuse of building elements and components and ultimately recycling? In order to achieve this, the traditional perception of the building and its structural configuration has to change.

It is clear that an alternative way of designing should be introduced into the design of new buildings. But what about the existing building stock? The number of new buildings constructed annually in developed countries barely corresponds to 1,5- 2 % of the existing building stock. This means that at the current construction rate, it would take from 50 to 100 years to replace the current stock of existing buildings entirely with new buildings (Sustainable Construction Task Group 2004). Since the existing building stock will remain with us for decades, the importance raises of the building stock as economic, social and cultural capital that should not be wasted.

2. Aims

Designing adaptable buildings incorporating reconfiguration and reuse is fundamentally different from conventional design methods. Conventially, the designer first conceives elements and systems for a building, and then specifies the materials and components needed to achieve the desired building performance and quality. When designing for reclaim of products and materials, it becomes essential to identify the source of suitable design methods, materials and building products before detailed design can begin (Addis 2006).

The key to the strategy for reconfiguration is not attempting to predict what kinds of forces may act on the building and when they may appear, but providing mechanisms by which the

building may respond to any combination of circumstances at any time (Fernandez 2004). In order to increase the building's transformation capacity to respond future's needs, building systems have to focus on further building systematisation on the one hand, and development of building methods that provide adaptable structures through potential disassembly on the different building levels on the other hand. Bearing the revealed environmental issues in mind, features have to be incorporated into the design, which allow disassembled building elements to have optimised lifetimes by introducing reuse of the building elements and components.

The aim of this paper is to specify decomposition characteristics of building structures, which determine the future reuse potentials of the building, its components and materials, in the framework of the existing building stock. Through a case study for renovation of social high-rise housing, the possibilities for reducing waste production and materials and energy consumption are being explored, by means of introduction of disassembly and reuse strategies.

3. Increase of sustainability through design for disassembly and reuse – a 4Dimensional Approach

3.1 From fixed to decomposable structures

Designing adaptable buildings incorporating reconfiguration and reuse for new buildings as well as for existing buildings is primarily different from traditional design methods. A short term view on the construction world has to be combined by a long term and holistic view.

4 Dimensional design (4D) refers to a design attitude providing artefacts with a long term vision (Debacker 2007). Therefore, the fourth dimension, i.e. *time*, is being integrated in the first stages of conception of a building and its components. Time is not only related to the wear and tear of the artefact, but also to changing and evolving circumstances which will affect it. In this sense the artefact and its components must have the potential to adapt to these unexpected changes. Consequently, 4 dimensional design considers an artefact as a materialised answer to a process of changing events. In spite of the unpredictability in accordance with great uncertainty how governing circumstances will evolve, the artefact may not be a static result of a pre-programmed end state. This design strategy conceives building artefacts that support evolving processes in life and society instead of predetermined designing for a specific situation.

This design strategy therefore prevents unnecessary construction and demolition waste production and maximises the potential energy embodied in materials, by taking into account buildings' life cycle on three different levels - material, component and artefact and introducing adaptability, reuse and recycling (Debacker 2007).

It is important to understand that recycling only partially addresses the construction and demolition waste problem, because it can use up considerable resources of material and energy in re-processing and transportation. Reuse is therefore the most desirable option,because it is the most effective in reducing the demand for resources and reducting waste (Webster 1995). However, nowadays one of the main obstructions to reuse building elements and components is the difficulty in separating materials and components from the remnants of the building. Often the only remaining solution of demolition leaves materials broken and unsuitable for anything other than land filling, combustion or recycling (downcycling) of the identifiable materials. The alternative for this *cradle to grave* cycle is to give the three levels of the built environment (excluding urbanism) - materials, components, and entire buildings - several lives before they must be disposed. Different possibilities for recovering materials and components in the built environment can be considerd through (Figure 1) (Crowther 2002):

- relocation and reuse of an entire building - when for example a temporary building is needed that can later be reused elsewhere for the same or similar purpose;
- reuse of major parts of a building - renovation of a building;

- reuse of components in a new building or elsewhere on the same building;
- reprocessing of components and materials into new components - recycling of materials into new materials.

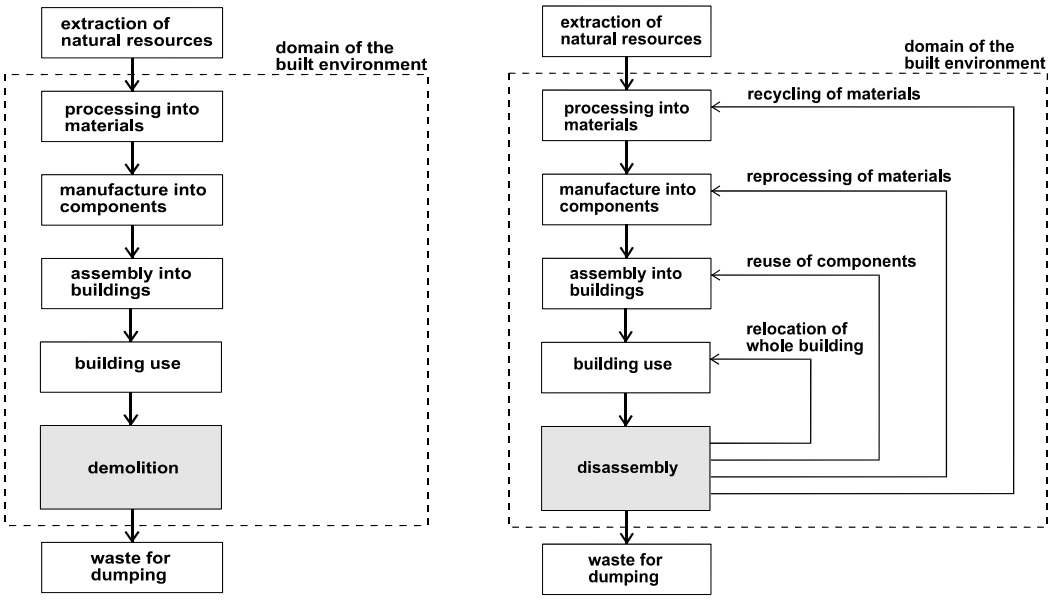

Fig. 1: The *cradle to grave* flow of resources in the built environment against different possible reincarnation scenarios (Crowther 2002)

The 4 Dimensional Design Strategy (Debacker 2007) and the Design for disassembly approach (Crowther 2002) are two strategies that take such an approach into account and can therefore be applied to increase the future rates of material and component reuse. Both consider an individual product as an assembly of functional components with multiple life spans, rather than a specific finalised artefact with singular longevity. These components can potentially be deconstructed and reconstructed into different configurations, shifting the emphasis from 'product longevity' to 'component longevity'. This approach creates potentiality to adaptable, reconfigurable and reusable building systems.

As a result of the fundamentally different nature of these design approaches, to achieve adaptable buildings considering reuse, emphasis lays on particular detailing for easy disassembly in accordance to the choice for suitable materials. Therefore, as an example, a possible 4 Dimensional Design approach for detailing will be discussed in this paper for a case study of existing high-rise buildings in Flanders.

3.2 Design for disassembly

Every building part performs a different function and has a specific life cycle span. "Faster-cycling" components such as, for example, dividing walls in the current building design can experience conflicts with "slower" building parts such as the structure of the building, when they need to be adapted. This explains why much of the construction and demolition waste does not arise from the demolition process itself, but from upgrading and maintenance processes such as refurbishment, organisational changes, and components reaching the end of their service life (Morgan and Stevenson 2005). These processes generate unnecessary amounts of waste, because in most cases not only the component needs to be repaired, but several adjacent and connecting elements have to be removed. Steven Brand (1995) therefore introduces a conceptual framework for dividing a building into different lifespan layers (Table 1), with different

functions, characterised by their anticipated need for modification. The separation of constructions in these six shearing functional layers proposed, allow one layer or system to be changed over time without affecting the other layers (Morgan and Stevenson 2005, Brand 1995):

- The *Site* is defined as geographical setting, the ground on which the building sits;
- The *Structure* is the foundations and load bearing components of the building, those parts that make the building stand up;
- The *Skin* of the building is the cladding and roofing system that excludes (or controls) the natural elements from the interior;
- The *Services* of the building (electrical, hydraulic, data, etc.);
- The *Space Plan,* the internal partitioning walls and systems;
- The *Stuff*, the furniture and other non-attached space defining elements.

Brand also gives an indication of the life expectancies of the different proposed building layers (Table 1). Besides Brand, a range of other writers and researchers have also suggested times for the service life expectancies of different parts or layers of buildings:

LAYER	***Structure***	***Skin***	***Services***	***Space plan***	***Reference***
LIFESPAN	*30-300 (typically 60)*	*20-60*	*7-15*	*3-30*	*(Brand 1994)*
	50	*50*	*15*	*5-7*	*(Duffy 1989)*
	40	*15*	*3*	*5-8*	*(Cook 1972)*
	50-75	*25*	*8-10*	*2-8*	*(Durmisevic and Brouwer 2002)*

Table 1: Life spans of building layers in years

There is significant relevance in these time related building layers to the concerns of design for disassembly. It is at the interfaces of these layers of different service life expectance that disassembly will need to occur. Facilitating such disassembly will allow buildings to develop over time in an environmentally and socially responsible way. An understanding of time related building layers will assist in understanding where and when to design for disassembly (Crowther 2002).

However, the functional levels discussed by Brand do not have consistent life cycles. This can be illustrated with technical installations, mentioned as one of the six main functional levels. There exist six main installation services: electrical supply, water supply, sewage system, ventilation, air conditioning, and heating, all having different functionality and changing rates. As a result, these constitute six additional functional levels (Durmisevic 2006). Therefore, fixing the number of changing functional levels is misleading as a concept for the design of adaptable structures that rely on disassembly of changing physical levels and materials.

The performance of a particular construction with respect to disassembly (and transformation of the structure) can however be measured by two criteria for disassembly according to Durmisevic (Durmisevic 2006): *independence* and *exchangeability* of materials. In other words, a building product can be dismantled if it is defined as an independent part of a building structure and if the interfaces with other parts are demountable. When considering independency and exchangeability of building materials, three elements of configuration design can be optimised

during design process, in order to provide higher disassembly potential of designed configuration (Durmisevic 2006):

- Material levels: This is an element of configuration design that deals with functional decomposition and allocation of functions into separate materials, which respond in a different way to changing conditions. These materials have separate lives, which lead to differential movement, differential durability, or incompatible materials;
- Technical composition: Technical composition deals with hierarchical arrangement of the materials, and relations between materials;
- Physical integration: Physical integration deals with interfaces that define the physical integrity of the structure.

On material level, the hierarchical levels of building composition/ decomposition can be defined as:

- The *building level:* represents the arrangement of systems, which are carriers of main building functions (load bearing construction, enclosure, partitioning, and servicing);
- The *system level:* represents the arrangement of components, which are carriers of the system functions (bearing, finishing, insulation, reflection etc) - the subfunctions of the building;
- The *component level:* represents the arrangement of elements and materials, which are carriers of component functions, being sub-functions of the system.

Therefore, in an attempt to design open/dynamic configurations, effort should be made to separate different building functions by use of separate subassemblies for each function on the building level, system level, as well as component level.

Different strategies have been studied for possible application in designing for disassembly (Addis, 2006, Durmisevic 2006, Crowther 2002, Sassi 2002, Thormark 2001). Examples of principles having relevance to the process of design for disassembly are shown in Table 1. They are divided in *building*, *system*, *component*, and *element* issues (Figure 1).

	Principle	Ref.
BUILDING LEVEL		
structure	- design bearing structures which can be strutted and adapted safely and easily	(Addis 2006, Addis and Schouten 2004)
services	- minimize the amount of mechanical services - strategic routing with a minimum of interpenetration between other layers	(Addis 2006, Morgan and Stevenson 2005, Addis and Schouten 2004)
disassembly	- allow for parallel disassembly rather than sequential disassembly so that components or materials can be removed without disrupting other components or materials	(Crowther 2002)
SYSTEM LEVEL		
transparancy	- building systems need to be visible and easy to identify	(Webster and Costello 2005)
regularity	- buildings systems and materials need to be similar throughout the building , and laid out in regular, repeating patterns	(Webster and Costello 2005)
COMPONENT LEVEL		
durability	- lengthen the life span of building components by patchable detailing	(Morgan and Stevenson 2005)
handling	- design easy to handle components - more easily dismantling can be achieved when structures are composed of a small number of larger members; larger members tend to resist damage more easily during the deconstruction process and can be removed more quickly from the structure - limit the amount of components and fixings - avoid special dismantling tools	(Morgan and Stevenson 2005)
limitations	- minimise the number of different types of components and fixings - this will simplify the process of sorting on site and make the potential for reprocess more attractive due to the larger quantities of same or similar items	(Crowther 2002)
connections	- materials should be easily separated into reusable components: use indirect connectors and dry-jointing	(Morgan and Stevenson 2005, Addis and Schouten 2004)
access	- place layers of elements with more frequent cycles close to the surface connections have to be at reach	(Morgan and Stevenson 2005, Brand 1995, Addis and Schouten 2004)
standardise	- use common, standard shapes and connections; minimize the number of different member size	(Webster and Costello 2005)
materials	- choose materials which allow above mentioned principles	(Addis 2006, Morgan and Stevenson 2005, Addis and Schouten 2004)
tolerances	- provide realistic tolerances to allow for movement during disassembly; the disassembly process may require greater tolerances than the manufacture process or the initial assembly process	(Crowther 2002)

Table 2: Design principles on building, system and component level for disassembly

3.3 Design for disassembly and adaptive reuse of existing buildings

Given that many buildings are being removed from sites due to redevelopment or their inability to remain useful within changing needs of users, the introduction of design for dissasembly in existing buildings prevents economic factors (such as labor costs) to encourage destructive demolition and disposal of buildings.

When considering the designer's brief for a new project, there is a natural hierarchy of waste minimisation to consider :

Hierarchy of Building Resource Management Goals
1. Adaptive reuse of existing building incorporating Design for Disassembly (DfD) for future adaptation
2. Design for Disassembly (DfD) for adaptability and longevity of new buildings
3. Reuse of building assemblies
4. Reuse of building components
5. Remanufacture of building components
6. Reuse of building materials
7. Recycling of materials
8. Reclamation of energy from building elements, components or materials
9. Biodegradation of building materials
10. Landfill sequestration for future resource/ energy recovery

Table 3: Building resource Management Hierarchy (Morgan and Stevenson 2005) (Thormark 2001)

Adaptive reuse of existing buildings, particularly as a result of performance upgrading, has been identified as having an important impact on sustainability of the built environment (Bromley et al. 2005, Sustainable Construction Task Group 2004). Ronald Rover's research (2004) concludes that the existing building stock has the greatest potential to lower the environmental load of the built environment significantly over the next 20 to 30 years. Furthermore, Peter Bullen (2007) adds that older buildings contain many materials that possess lifecycle benefits not originally realised during their initial occupancy. Adaptive reuse of existing buildings bypasses the wasteful processes of demolition and reconstruction, therefore contributing to the environment and becoming an essential component of sustainable developments (Dept. of Environment and Heritage, 2004).

Therefore, it is essential to develop corresponding renovation strategies of waste minimalisation and reuse for existing buildings. The application of principles discussed in Table 2 will be illustrated in a case study of a buildings system design, introduced for adaptive reuse of existing high-rise buildings. This case study will explore the possibilities for waste minimalisation and reduction of materials and energy consumption through disassembly and reuse strategies for renovation.

4. Case Study

4.1 Design for disassembly and reuse for existing (high-rise) buildings

A feasibility estimation of the described design approach for existing buildings is being evaluated through detailing of a fictional renovation project for high-rise buildings in Belgium (Elsen 2007). The Chicago building, a 27 floors high-rise housing building situated in Antwerp (Belgium), represents a large number of similar high-rise housing buildings in Flanders, built to answer the rising prices of the building plots in the 1970's. As a result of the rigid construction design applied on this building, efficient, qualitative and adaptable living has been obstructed after several years of use.

Under the present circumstances, the inability of meeting changing inhabitants' needs will often cause demolition of this type of buildings, although the structural systems would still meet the present requirements. Considering that structural systems generally account for wel over 50% of a building's mass, a renovation approach (reuse of building parts) is more preferable then total replacement of the buildings (Webster and Costello 2005).

To prevent the mentioned waste and energy issues and to answer the environmental concerns in the future, a dynamic concept is being introduced in the renovation intervention. Through design for disassembly a tool is supplied to support the natural evolution of the inhabitants needs, allowing structural changes and taking reuse of building components in consideration. Through a separation of *support* (including the collective facilities) and *infill* two main independant layers are being created. Therefore the originally building is stripped down to the bearing structure, existing of concrete floor slabs and bearing walls. The created empty plots, function as a support for the infill of various dwelling types. Those infilling dwellings can be transformed within the main structure according to changing requirements.

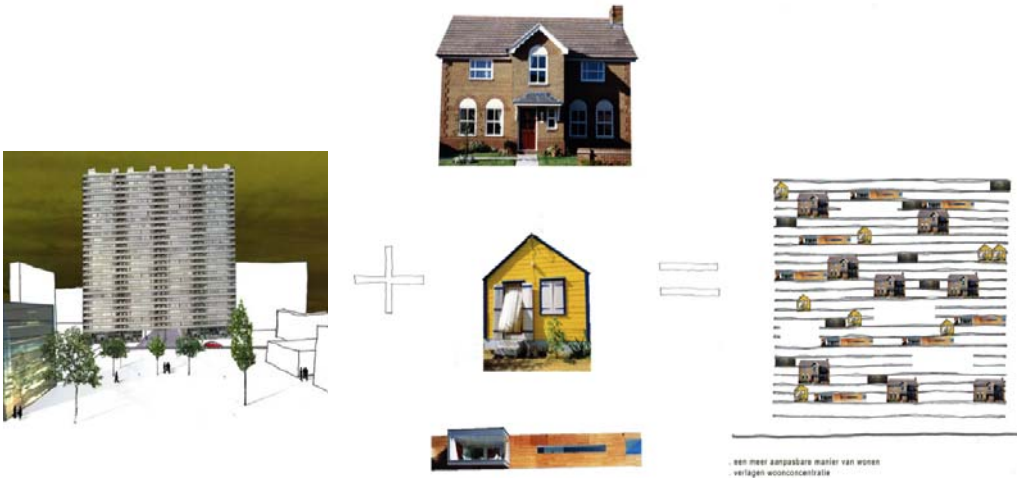

Fig. 2: Dynamic transformable concept for Chicago Building, Antwerp, Belgium (Elsen 2007)

Despite the unadaptable character of the removed ancient infill, it does incorporate a minor level of reuse and recycling. Flooring materials (tiles, floor boards), timber and metal window frames and doors, staircases, sinks, basins and baths, radiators (mainly cast iron), light fittings and miscellaneous furniture and fittings can still be salvaged (Addis 2006).

The new infill proposal includes the described layering using Brand's six S's system of Site - Structure - Skin - Services - Space Plan - Stuff (Brand 1995). This layering enables the different participants of the building to intervene in specific construction levels, without influencing the functioning of other layers. The created levels on scale of the entire building are:

- the bearing structure (floor slabs and bearing walls);
- vertical circulation facilities (stairs, elevators);
- technical services (electrical supply, water supply;
- public space;
- infilling dwellings.

4.2 Proposal for an adaptable renovation building system

The introduced technical *Services* and the assemblies composing the *Skin* layer (thermal insulation, acoustic) of the infilling dwelling construction system can not be combined and may not be fixed to the main existing structure. Indeed, this would obstruct the adaptation or reconfiguration of the dwellings during their operation life. To prevent this, the introduced construction system is characterised by a further layering, inside the existing bearing structure:

- skin;
- services;

- space plan;
- stuff[3].

The *space plan* proposition for the created empty plots structure interconnects adjacent plots, separated by the bearing walls, through introduction of new openings in these walls. These openings enlarge the potentialities of the former structure: larger building plots can be acchieved, allowing houses to expand, reconfigure or contract to neighbouring plots. These reconfigurations can be required when changes occur in the socio-economical situation of the inhabitants.

To allow to answer these various scenarios occuring during an inhabitant's life process and to answer the ecological issues discussed in this paper, the proposed construction system for the infill of the building takes adaptability, disassembly and reuse into account in its initial design. More specific, this construction system allows to built up the '*skin*' layer of the dwellings, by means of combinations of a minimal number of functional basic elements with multiple life spans, applying the 4 Dimensional Design approach. Three types of basic elements can be discerned (Fig.4):

- *line elements* (one-dimensional): steel profiles
- *plane elements* (two-dimensional): insulation and covering panels
- *volume elements* (three-dimensional): corner elements that enable the assembly of a three dimensional frame structure

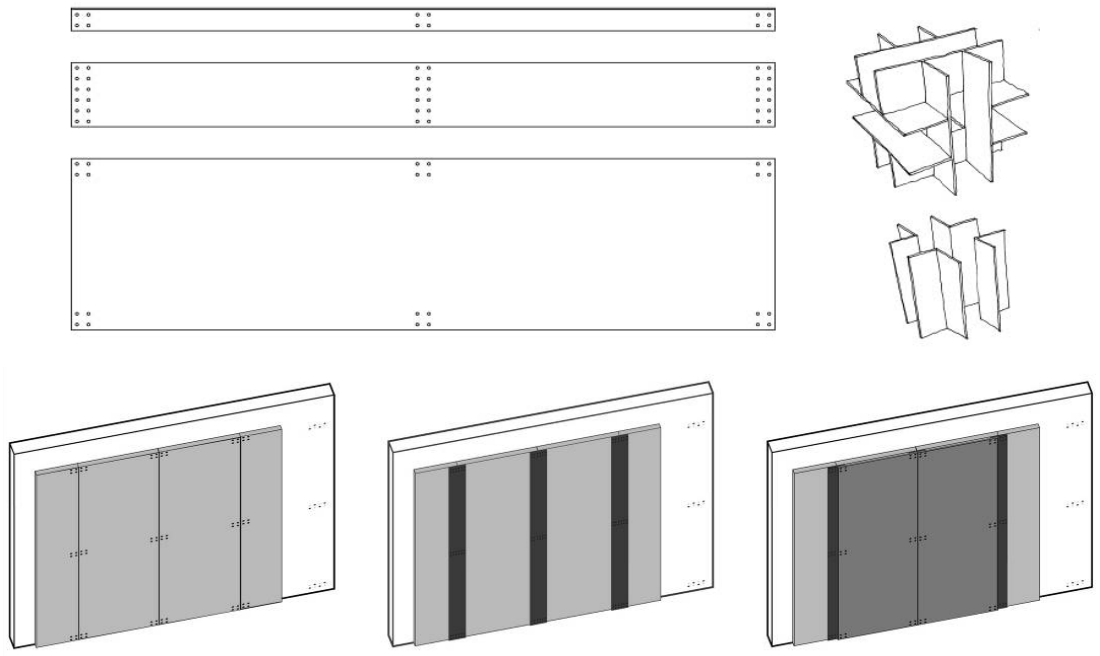

Fig. 3: Basic elements of the renovation construction system composing the *Skin* layer of the infilling dwellings (Elsen 2007)

Although in today's economy steel is hardly ever reclaimed, but rather separated from other materials and recycled, it has a great potential for reuse (Webster and Costello, 2005). Therefore

[3] In this case study, the layer *Stuff* has not been included as it consists of non-built artefacts such as furniture that are not attached to the building system.

the existing concrete bearing structure is combined with steel framing for the infill. To ensure disassembly and adaptability, attention is given to the nature of the connections: mechanical fasteners (bolts) are being used with integrated tolerances to simplify deconstruction and adaptation operations. Through the three types of basic elements a surrounding skin can be achieved, providing satisfying thermal and acoustical quality, comfort and safety.

To prevent technical services to restrict the realised housing flexibility, supply and drainage of water, and supply of electricity and heating also has to be conceived in an adaptable and accessible way. The designed service distributing system takes into account the restricted storey height. A shaft distribution system is opted, providing all services through a specially designed standardised unit (Figure 4). These units are provided on a fixed point on every single plot on the building space plan. As a result, for all possible dwelling plan scenarios possible access is given to all technical services. Also, flexible heating elements can for example, be introduced between the covering panels and the insulation panels if necessary (Figure 4). Those heating elements can also be relocated or taken away if necessary.

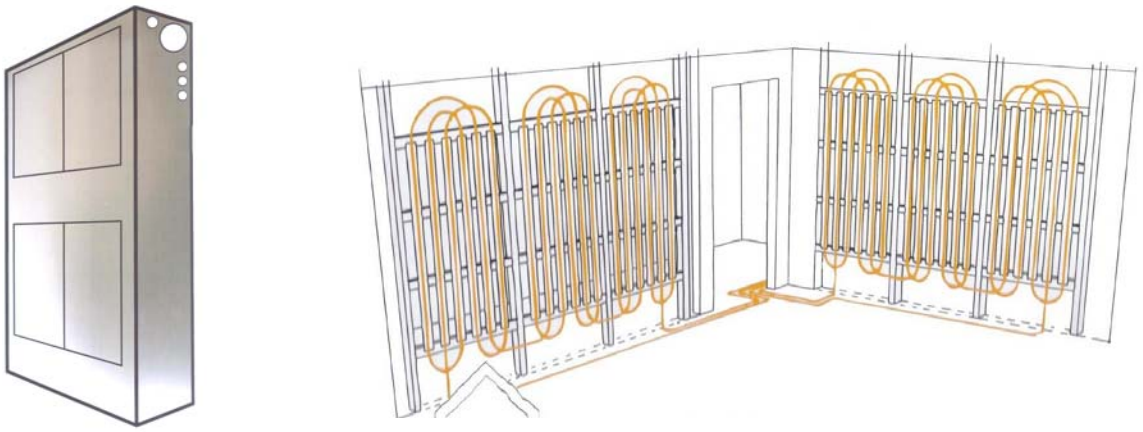

Fig. 4: Technical services: standardised service unit and adaptable wall heating system (Elsen 2007)

4.3 Living as an constantly evolving process through scenarios

The approach for the renovation of the Chicago building, that combines a support - infill system with the use of an adaptable and reusable construction system, endorses transitions of plot and housing configurations. The illustration below (Figure 5) depicts the adaptability of the dwellings and the plot structure through the execution of a succession of scenarios (a quarter of a floor plan is shown).

An initial housing configuration, providing three housing types for family compositions of 1, 2 and 4 persons can be easily converted to new configurations, answering changing needs or dealing with varying number of inhabitants.

Clearly, the introduction of openings inside the building structure considerably enlarges the potential of the existing plot structure that used to be very rigid and unadaptable as a result of its static design. The different introduced space plan scenarios now create the opportunity to answer to changing needs of the habitants in a non- destructive way.

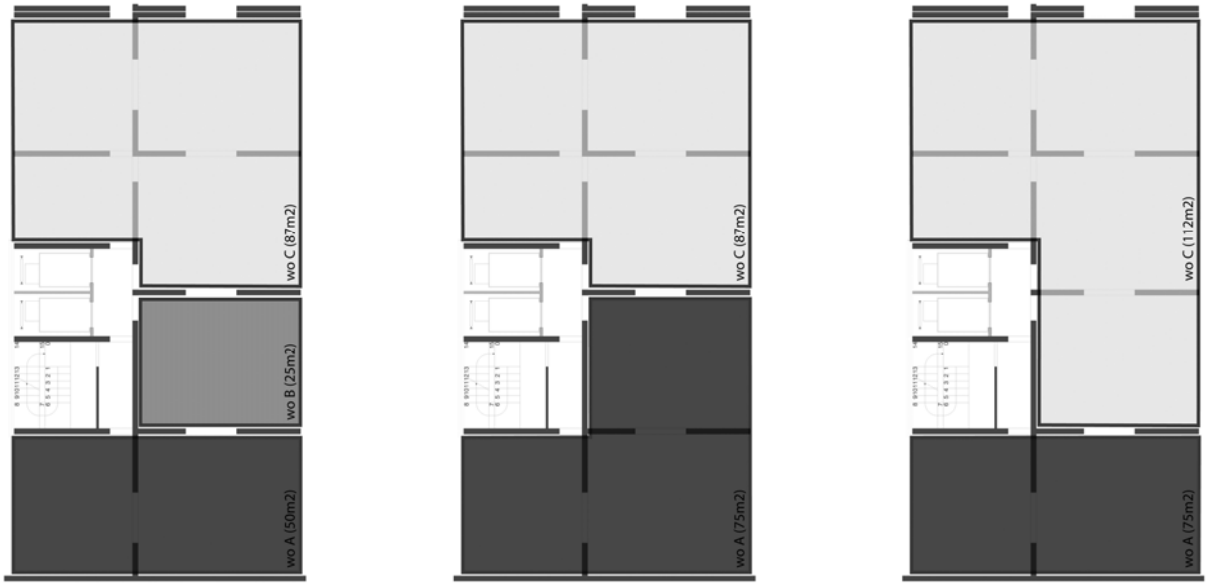

Fig. 5: Adaptive reuse of the Chicago Building: three possible space plan scenarios (Elsen 2007)

4. Conclusions

To allow and to facilitate building transformations in the future, the traditional perception of the building and its structural configuration has to change. Even if buildings can not foresee the uncertainties that the future might bring, social acceptance of failing buildings being demolished and new built without taking reuse in mind has to be undermined.

By adopting concepts as design for disassembly, systems of a building are becoming more responsive to modifications and changes of use. At the same time, the technical composition of a building becomes transformable, which is a precondition for reuse and recycling of building components.

New buildings as well as the existing building stock have to be considered in this research field. Changing housing conditions and requirements concerning quality, comfort and safety of dwellings are always to be expected. Renovation interventions that help to achieve these standards cannot longer be seen as isolated actions, generating great amounts of refurbishment waste after each taken action. The existing building as well as the new interventions and their interrelations have to be assessed, before and after renovation, aiming to provide potentialities for a better use, maintenance, but also further interventions, which will certainly take place in the future.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

NEW ARTISANSHIP FOR NEW COMMUNITIES

Frugal Design as the way of the artisan in the new world

Jogi Panghaal[1]

Abstract

In their practice artisans have managed to not only address the needs of their buyers but also create models of product quality that are distinct and unique from the machine made cheaper products which have stolen their traditional buyers. New projects show that artisans can regain their buyers by clearly understanding the nature and role of craft practice in contemporary world. It is by combining tacit knowledge of the artisan with the explicit knowledge of the designer and buyer that a fresh strategy can be evolved which will ensure that artisan can sustain his practice and maintain his control over the quality of his product and continue to service his buyers.

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1. Context

India has by a conservative estimate about 11 million to 14 million artisans for whom practicing artisanship is essentially a livelihood issue. This community of artisanship is spread more or less evenly across the country with few exceptions. Within the community of this artisanship, though there are wide differences of histories, cultures, social status, skills and levels of prosperity of artisans depending upon their locations (geography, remote or close access to raw material, market) and presence of enabling infra-structure (government policies or NGO liaison offices, Banks).

As much as there are differences and diversities in artisan communities there are also some common threads that connect them. This vast community of artisans has served various needs of communities of India over the years particularly in the rural areas. Even though India is urbanizing rapidly, over 60% of its population still resides in about 600,000 villages. In the course of serving community's needs, artisans have articulated and informed the forms of all the products and services that one uses in a day today life in India particularly in rural regions.

These processes of making and informing a product or service have been born largely in the challenging environments of scarcity of resources and inability to afford and source these from the market. This has resulted in the artisans working closely with nature and its materials, processes and its laws. The form of products and services that have emerged from this engagement with their natural resource fields and sites exhibit a certain quality, of frugality, a 'certain goodness, a certain beauty and a certain search for truthfulness'.

This frugality of form and economy of movements of its making, when situated or embedded in the day today life of a community of users, produces very elegant and appropriate solutions which are often sustainable and also have a great presence of quality in them. These, in fact, do represent an image of a desirable life style that is, both sustainable and achievable.

Artisans engagement with different natural contexts has given rise to development of a huge range of diverse product forms and other cultural artifacts besides development of range of skills and tacit knowledge among artisans. This reservoir of diverse product forms and accompanying skills that addresses our daily needs is not only a local or a global cultural resource but also an essential keeper of quality among the communities that it serves.

This frugal design has a light presence on earth but also a constant reminder to a community of their true calling. It culturally re-enforces a common idea of quality in all its members. It is from their appreciation of this quality that they derive a common idea of identity. What is significant here is that even the poorest person in a community has an idea of quality that is culturally embedded in him and puts him in the same league as a less poor person. It is important to state here that we were not looking to work with poor person for any altruistic reasons as such but investigating the nature of quality as it resides with communities who are at the so called bottom of the pyramid.

In this sense, quality is, perhaps the embodiment of what Prof Ikujiro Nonaka has called in another context, ‘values of truth, goodness and beauty’.

Artisans are part time farmers or the other way around. For most artisans either agriculture or craft is a supplementary income and they cannot do without it. Craft sector is the biggest employer after agriculture in India. With its capacity to create employment with low capital investment and high value addition, it also is a sector that every government wants to promote. India exports crafts worth $3.5 billion a year (2005 figures) with a growth rate of 10% every year since 2000. It is thus a significant sector for Indian economy. But its larger impact is in the local, informal economy of India.

Artisan products are sold in the local haats or local bazaars. With increasing penetration of cheap machine made products into the rural regions, their traditional markets are diminishing by the day. They need to find new markets. In a democratic set up as in India, they have managed to create a stake for themselves as voters and have managed to get governments to initiate several steps to address their situation. Many policy decisions have been affected that address their concerns. Public sector organizations in the sector like the Development Commissioner of Handicrafts (DCH) facilitate design intervention projects among other things.

Artisan communities are largely illiterate but are very knowledgeable. They own a huge repository of tacit knowledge, which is subjective and experiential in nature, and as Prof Nonaka says it cannot be expressed in words, sentences, numbers and formulas. It is this knowledge that has been used to inform the craft forms over the years. Tacit knowledge happens, learns, adapts, adopts and changes with situation but it is very much the product and fixture of that particular place where it originates. It cannot be transported. With tacit knowledge artisan is able to make for the local intimate area and scale but for a distant and a new market he needs to learn to make it differently For that to happen he needs a partnership with explicit knowledge workers who can help him to use his skills, capabilities and sensibilities and reposition these to design a product or services that find new users and new markets.

2. Project

Bastar is a tribal district in the forested areas of Chattisgarh state in Central India. It is believed that Iron forging techniques and bronze metal castings techniques through lost wax process have been practiced there for nearly 2000 years. It’s an area rich with iron ore mines. There are about 1000 Forge Ironsmiths and about 800 Bronze Casters in Bastar.

Objective of my project which I called Designshala (a home to learn to design) was mainly to develop a series of new products for domestic and personal use in Wrought Iron and Bronze Castings that would address the needs of new buyers and also ‘train’ artisans in ways to learn about new users for their products. A total of 70 artisans worked in phases over a year to make nearly 100 objects each in wrought iron and bronze castings. There were both men and women among artisans, men significantly more than women. Two designers worked together with this group of artisans right through the year.

3. Process

We started by inter-acting closely with artisans and their families and experiencing the ‘quality’ of their lives and their self made object forms with them. It meant looking critically and appreciatively into their habitats, their food and drinks practices, dance forms, healing traditions, listening to their stories, songs and epics, watching their performances in theatre and dances, studying their dresses and traditions. It meant participating in their rituals and ceremonies and listening to their mythologies. Above all watching them make craft objects with their tacit knowledge.

Their core values of goodness, beauty and truthfulness seem to be created with this tacit knowledge and in which every body collaborates fully.

We looked at the material of the crafts that we were focusing on and observed closely how artisans played with it to discover attributes and values of sensuality of the material. (In the nature of ‘you make material but material makes you too’) the speed of slowness or haste. Physical movements of the body to make these products was also observed with efforts always to minimize waste of human energy in sloppy movements.

One of the key observations at this early stage of project is to determine the speed at which products are being made. The beat of making of a product can lead to very meaningful decision making. More beat a product has, more time it has taken to make it and slower would be its embedded speed.

Designshala was an open event in a public space that constantly attracted visitors among whom were students, tourists, a large number of them Indians and some foreigners. There was a constant dialogue between them and artisans mediated by designers.

Designs developed in a manner of shared ideas with their tentative playfulness with materials yielding interesting forms, which were than persuaded to lead to a particular agreed direction.
At every stage, ownership of the evolving form rested with them. They did not do any thing that they did not understand. This meant that they were always working as creative partners in this and not as cheap labor.

What seemed to happen was that tacit knowledge did create the initial start of form making in the material after which designers drew on papers and modeled in wax or clay to create a situation where artisans were able to come out of their own thinking and practicing domain and look critically and reflectively at what designers had done.

This led to opening up the whole issue of the craft and visualizing the entire process of making of craft in simple images. This helped to generate conversations on sustainable practices in terms of use of resources and in terms of finding alternatives to some of these unsustainable practices.

Tacit knowledge helps artisans to make products that largely adhere to sustainable production of them but there are problems when disproportionate success of a particular product leads to rise in its demand. At this stage one needs to collaborate with other explicit knowledge workers like designers and determine how much is the correct,

appropriate and sustainable scale of production. Like what has been said before, too little demand is a disaster but too much demand is a disaster too. Here strategic design choices are critical.

Economy of means of doing things has been a major element that has been the bedrock of sustainable practice. With new product development it created new challenges for both designers and artisans. But with practice and experience we were able to create and observe new body movements, as economical as before to make our new products. Their tacit knowledge helped them to relate to designers new challenge and this new series of products also helped them to move to another and a new level of tacit knowledge.

Tacit knowledge seemed to become explicit knowledge even for artisans through the processes of drawing and modeling that designers were using to visualize the product in greater detail. This helped artisan to look at their own creation and practice in a critical and reflective manner, which led to creation of better levels of skills, practices, forms and new product proposals and designs. More importantly it led to creation of new knowledge both in the tacit knowledge domain and in the explicit knowledge domain for both artisans and designers.

This was an interesting process, which seemed to suggest important roles for persons with explicit knowledge skills. By using certain simple communication devices like words, story telling, drawings, sketches, it is possible to co-create products with artisans like co-authorship of a story. Where these artisans can continue to be creative masters of their professional domain and yet be in an evolutionary mode in the manner in which they grow in their own domains.

The ‘site’ or ‘field’ of the body of a crafted product than is where the evidence of transformation of tacit knowledge to explicit and to a new collective tacit knowledge seems to be seen to be happening.

It was the open source nature of the workshops that led to potential buyers being drawn into lengthy conversations with artisans. Their conversations again led to situations where there was an equal give and take between artisan and potential buyer where both moved from their stated positions of maker and buyer to that of joint creators. New knowledge about the role that artisan can play in their lives and for artisan to know that there are new kind of buyers for his works. This was often difficult to navigate for both but necessary for artisan to understand that new buyer demands a different kind of engagement which is that of co-creation.

It is evident that an active play and creative engagement between tacit knowledge workers and explicit knowledge workers would help both. It is important that this relationship survives in a knowledge economy and a knowledge society. Tacit knowledge comes from the bottom of the pyramid communities and it is important that it continues to be valued and used to make innovations that would gain them new market share on one hand and also continue to give them a central role as active participant in their own development stories by continuing to create more tacit knowledge.
It would also help the buyers to exercise the real choice to connect to the real stories of frugal nature of doing things.

Products of artisanship are not just numbers and volumes. These are individual items, each different from the other. Today's buyer has to be open to make major shifts in looking at craft items as they are, distinct from machine made items. Two universes are totally different from each other but they help us to appreciate the other. They help us to locate their boundaries, their property, their attributes. There is a need for a wider social conversation on this so that artisans are not stressed to make things in a manner that can only be machine made and vice versa.

Designers need to be sensitive to their own biases of aesthetic models as their education naturally inclines them towards western sources and perhaps machine made aesthetics more than it does towards hand making aesthetics. The designer's education looks at quality from the industrial shop floor and it tends to ignore the complexity, richness and plurality of the aesthetics of the hand made solutions. Designers tend to flatten and homogenize the diversity of form of artisan's products, texture, color and sensuality that his tacit knowledge has given him to embed in the product.

It is important for designers to be open and work creatively along with artisans to discover the local and tacit elements of design in the craft of a region. This perspective will help to keep the diversities of the forms and visual languages alive. It is also important for designer to be sensitive to the frugal notions of design whereby certain economy of means, materials and methods gives rise to a very distinctive look and feel of the products and services. This is perhaps the core of sustainable design perspective in our communities.

4. Tools

1. Story telling in the local languages was most extensively used to create an atmosphere for all to imagine new characters. Often development of new characters in a spontaneous manner led to new story making.

2. Photos, drawings and models were used as a process to trigger idea movement and also shown as the material of the designer as much as craft materials are materials of artisans.

3. Actual samples from market or buyers or from other producer groups was also used to trigger critical reflection, new ideation and development of new stories

4. Songs, mythological dramas were often used to create a sequence of events where it was needed to know the order of things.

5. Visit to potential users home was most interesting as they could see their/others products being used in actual context for which they had made it. It also leaves them wondering for new product ideas and a new tacit knowledge.

6. Visit to monuments, ancient sites with remains and museum to check on the local vocabulary of form and materials was useful whenever mediated by designers. It was clear that designers were constantly interpreting explicit knowledge to artisans in a tacit manner to communicate subjects better.

7. Exposure to new materials and new tools and techniques was arranged with mixed results. Some ideas were picked up as others were ignored as impractical and inefficient in the context that we were working in. Its possible that in a different context their choice of what they accept and what they reject would be different..

8. A detailed brief was made and the bigger picture of what we were setting out to do in a year was shared with artisans.

9. Workshop was open to visitors and in a public space. This encouraged a whole lot of people to visit us and share their ideas with us even as they observed the workshop.

10. Exhibitions of the final products were organized in a show and tell mode for buyers where skill demonstration and role of artisans was paramount. This was also an open invite for potential buyers to come and co-create products of their concern.

11. Detailed visual documentation was made with still digital camera to share it with future workshops participants.

5. Issues

1. Keeping the **livelihood** of this vast number of artisans intact is one of the biggest challenges. To do this in the face of homogenizing nature of globalization is even bigger challenge. This must be taken on by mobilizing the participation of all who can bring new knowledge and expertise to help mount effective challenge. Fortunately artisans are open to change, open to learning and to creating new tacit knowledge. Like mentioned before, it is perhaps important that we have both, handmade and machine made universes of doing things surviving side by side. Both can inform each other and evolve independently. They provide real choice of quality, sensibility, diversity and sustainability to the world. Perhaps artisan need to reinvent himself as an artisan equipped with new knowledge of sustainability.

2. Artisan practice contains an aesthetic which is very special and different from what machine made aesthetic provides. Artisan is excluded from a creative process if his aesthetic is always marginalized and he has to constantly adjust to the new governing aesthetic of the machine. Designers need to be sensitive to this and they can play a positive role if their visual vocabulary included references to the artisan aesthetics. This would make designers practice **inclusive for artisan**.

3. When designers work with artisans they bring in their **explicit knowledge skills to the domain of tacit knowledge skills** of artisans. In the course of their partnership each domain learns from the other. Tacit knowledge become explicit knowledge and together these two knowledge systems produce another level of tacit knowledge when artisans work with it. This onward spiral of new knowledge creation should be allowed to have its full continuous play. New ways need to be found to harness the movement of tacit knowledge as it contains the native wisdom of a particular community that has been co-created by all its active members over the years.

4. In a scarcity hit regions of the world, creativity has been used to not only develop products and services that are **frugal** in nature but also the manner of their making shows an economy of creation, (in materials, tools, energy including human). When we shift to an economy of easy availability of resources every where, any time there is a real possibility of the loss of economical ways of doing things, of frugal design, which is inherently sustainable and perhaps desirable.

5. Hand made universe is actually handmade, slow and sustainable if scale of production of objects is within the appropriate **scale** of the handmade. If the order of things move into numbers that rival machine made production number, than we have to reconsider the choice of handmade to address that particular order. Real artisanship that produces quality needs time, skills, appropriate tools, appropriate scale of production and discerning users.

6. Finally artisan demands **recognition, respect and dignity** for having first created a physical example of an idea of certain quality in our midst and in our communities and his willingness and eagerness to take that idea further into our common futures.

seven plates for table, in bronze, 10cms dia. Each plate has a boarder from a tribal field.

Six versions of cow on the road in Bronze, size length 14cms, height 7cms

A field in the plate, bronze cast, 30cms dia. Theme was to bring the feel of fields in a plate to an urban household. To be used as a fruit bowl.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Creative Communities for Sustainable Lifestyles

Visions of sustainable ways of living in Brazil, India, China and Europe...

Lara Penin[1], François Jègou[2] and Sara Girardi[3]

Abstract

The project Creative Communities for Sustainable Lifestyles (CCSL) proposed to enlarge and adapt the notions of creative communities and promising cases for new models of sustainable lifestyles at a worldwide scale, comparing some European experiences with ones observed in emerging countries.

The paper will discuss the CCSL results, first regarding the nature of the local initiatives and how they are positioned within the worldwide arena of social innovation phenomenon.

Second, the specific design capabilities useful to the diffusion of these initiatives. A design exercise with design students in the three countries has generated a set of scenarios of localised collaborative services providing valuable insights for the construction of a rough map of need-areas and possible local penetration of promising cases.

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1. Introduction

The EMUDE research[4] has exposed the phenomenon of diffused social innovation, specifically under the form of collaborative everyday life creativity (the *creative communities*) in Europe: groups of active, enterprising people inventing and putting into practice original ways of dealing with everyday problems, and by doing this, offering insights of new possible sustainable ways of living. But could these initiatives of collaborative everyday life creativity be considered a global phenomenon, present not only in the mature industrial economies but also in emerging ones? Can diffused social innovation be considered as a global phenomenon?

This was the starting point for the project Creative Communities for Sustainable Lifestyles (CCSL)[5], being to enlarge and adapt the notions of creative communities and promising cases for new models of sustainable lifestyles at a worldwide scale, comparing some European experiences with others that can be observed in growing urban populations of emerging countries.

CCSL project has proposed to investigate this phenomenon in three emerging countries (Brazil, China and India) focusing on what could be the similarities and differences between those *creative communities* and the ones in Europe. In particular:

- Considering creative communities in different countries: what are the similarities and differences between them? In particular: what can Europe learn from emerging countries, and vice versa?
- Considering creative communities in emerging countries: do these cases indicate a direction for sustainable lifestyles? In particular: do they indicate sustainable lifestyles for the growing urban population of emerging countries?
- Considering creative communities as successful cases of grass roots innovation: how have they been improved and replicated? What kind of specific initiatives have been promoted?
- Considering the issues involved in improving and replicating such cases: could the communication and design capabilities that have been applied in some European cases be usefully adopted in the context of emerging countries?

CCSL has conducted research activities based on partnerships with local institutions[6] through a research process based on the identification and documentation of local initiatives and the interpretation of these initiatives in terms of their *service ideas*, through an open dialogue with local experts in the three countries.

In parallel to that, CCSL has proposed a design exercise, targeted at design students in Brazil, India and China, aiming at the interpretation of local based collaborative services. The aim was in one hand, explore potential new roles and capabilities that designers might develop and apply in this new field, and in the other hand, explore how some service ideas that were found to be recurrent worldwide, could be proposed for replication in these courtiers.

Local cases and previously collected cases in European context (EMUDE) were presented to the design students, who carried out a contextualisation exercise of their assigned

[4] EMUDE has been a Special Support Action promoted in the framework of the 6th Framework Program (priority 3-NMP) of the European Commission. EMUDE was coordinated by INDACO, Politecnico di Milano and developed by 10 research centres and universities and 8 European schools of design. EMUDE was concluded in April 2006.

[5] CCSL project was coordinated by Politecnico di Milano and Strategic Design Scenarios and promoted by the Sustainable Lifestyle Task Force, funded by the Swedish Government within the United Nations 10 Year Framework of Programmes on Sustainable Consumption and Production (Marrakech Process) and endorsed by the United Nations Environmental Program. CCSL ran from October 2006 to November 2007.

[6] CCSL partners were: Technology & Social Development Laboratory (LTDS) at Rio de Janeiro Federal University (UFRJ) in Brazil; SRISTI/HoneyBee, The Society for Research and Initiatives for Sustainable Technologies and Institutions and the National Institute of Design (NID) in India (Ahmedabad); and Institute of Civil Society (ICS), Sun Yat-sen University and the School of Design, Guangzhou Academy of Fine Art (GAFA) (Guangzhou) in China.

service ideas and the development of a scenario building process aiming at creating and visualising potential localised scenarios of sustainable ways of living.

The CCSL research process and its results can be discussed in two levels:

First, the appreciation of the nature of local cases and how they are positioned within the worldwide arena of social innovation phenomena. Exploring the creative communities concept through non-European contexts, has led to the acknowledgement that in these emerging countries, **there are groups of people who organise themselves to solve everyday life problems or to open new possibilities in the new urban environments, and in so doing invent and practice sustainable ways of living,** even though if terms like “community” or “creativity” have different meanings from the ones adopted in the definition of creative communities in Europe.

Results of these initiatives are *collaborative services;* but are they different in emerging countries from those found in Europe? As it will be seen, CCSL has revealed that, in one hand very similar *service ideas* are found worldwide, even if motivations and social meaning can vary from place to place, whilst their results are similar. In the other hand, local conditions and particularities have established a connection between creative communities and their collaborative services to initiatives definable as micro-entrepreneurship.

The second level of the discussion of results refers to partial or complete visions of sustainable lifestyles that emerge in each country resulting from the conducted design exercise. These activities have led to an outline of which kind of service ideas are more likely to be adopted in each of the three contexts; and which instead would not and why. This process allows delineating a (rough) map of need-areas and possible penetration of promising cases in Brazil, China and India.

The nature and quality of tentative visualizations produced by the different scenario building exercises with students in Rio, Ahmedabad and Guangzhou permit to better focus some concrete examples of solutions and picture the way they could be embedded in the current local culture and concerns.

2. Main results

The first level of results, deriving from the experts workshops conducted, are related to the nature of local cases found and how they are positioned within the worldwide arena of social innovation phenomena, summarized here bellow.

Good Ideas Spread Worldwide

Creative communities and collaborative services are deeply rooted in their specific contexts, but their ***service ideas*** can spread worldwide. In practice, this means that, in different contexts, a ***service idea*** can be roughly the same, though its motivations and social meaning may be slightly different from case to case.

C*ollaborative services* are organizations that produce results for all participants, i.e. forms of service. In other words: *collaborative service* is a service that, to exist and be effective requires some form of community. Every creative community, considered in its complexity, is by necessity deeply rooted in a local social and physical context. The same is true for the corresponding collaborative service. But for this service, as for every service, we can recognize and outline a kind of structure that is less context-specific, which is called *service idea*. More precisely, it is the system architecture and the partner’s positions and motivations that characterize a service and enable it to exist and, perhaps, be effective.

The importance of the notion of service idea is given by the fact that it permits to separate what can be reproduced (because non context-specific), if the conditions are given, from what cannot be reproduced (as the creative communities and their related collaborative services).

By comparing creative communities cases collected in Europe and emerging countries we have indeed verified, here and there, initiatives belonging to the same clusters of services, accepting that their motivations and social meaning change, they are:

- **purchase groups**: groups of consumers who organise and manage the purchase of healthy and fresh produce in bulk, directly from producers;
- **community supported agriculture**: direct trade networks between producers and consumers, connecting urban and rural people and helping to sustain small-scale, organic agriculture;
- **urban vegetable gardens**: groups of people who organise urban farming, raising crops in their backyards or in public areas, obtaining fresh produce and greening the city;
- **child socialization:** places for children to meet and play in an open-minded social atmosphere, often favouring interaction among parents and becoming a meeting place and reference point for the entire neighbourhood;
- **local exchange trading systems:** mutual exchange of services, professional and non-professional skills among the members of a community;
- **community care for the elderly:** groups of senior citizens who can re-create their social circles, share everyday life tasks and get involved in productive activities;
- **community nursery**: small-scale home-based nurseries;
- **car-pooling:** alternative use of individual cars organised by groups of people who live or work in the same area, or who use similar routes in town.

Creative Communities in emerging countries are related to micro-entrepreneurship

If in one hand, we observed that the same service ideas appeared equally in both industrialised and emerging contexts, on the other hand, something different, specifically related to emerging contexts has appeared: cases linked to micro-entrepreneurship, revealing a new sub-system of grass-roots social innovation in everyday life.

This finding causes an important change in terms of the point-of-view we have used so far to analyse Creative Communities initiatives: EMUDE has always looked at the cases from the final user point-of-view (*demand*). Now, for emerging countries, we also have to consider the point-of-view of the *offer in order to grasp the complete meaning of the initiative*. While in Europe creative community initiatives are mainly demand-based (emerging from a specific demand for services from the end-user), in emerging countries, a different mix of more supply-based motivations appear, emerging from the offer of specific services that groups of people organise and put forward on a micro-entrepreneurship basis: small, localised, productive activities, which have a direct impact on the quality of life, offering a source of income that guarantees the inclusion of groups of people in the economy.

Collaborative services and micro-entrepreneurship are sometimes even opposed in emerging contexts and regarded as potentially competitive. Groups of people organizing on a private basis to co-produce a service for themselves could be seen as a possible threat to employment. In India for instance, the dynamism of micro services pushed by overpopulation and unemployment in cities tends to discourage enabling solutions.

However, it is important to interpret micro-entrepreneurship within contextual conditions and circumstances. In Brazil for example, it is often connected to existing networks and

supporting initiatives from civil society organisations working through some community-based approach.[7]

Not all cases of micro-entrepreneurship in emerging countries can however be considered as creative communities, opening up a grey area, a blur between near but different concepts. In Brazil, India and China, the expression "creative communities", when explained as *grass roots social innovation*, is often considered as a part of other, existing and relatively consolidated arenas of discussion and fields of actions:

- *The development of under-developed communities*. In this case the common denominator with our concept of creative communities is the collaborative dimension. But the communities being considered here are mainly traditional ones, and the contexts where these actions take place are mainly rural (such as villages in India) or very poor (such as the Brazilian *favelas*).
- *The promotion of new (profit and non profit) enterprises*, meaning the results of creativity and entrepreneurial capacities of individual people. In this case, the common denominator is the high degree of entrepreneurship in solving the problem. But here the focus is on individual capabilities rather than in groups of people who collaborate to solve common problems as it occurs in creative communities,
- *The promotion of charity-oriented organisations*, relating to organisations where someone voluntarily does something for someone else. In this case, the common denominator with is the promotion of social value. But here the relationships mainly consist of someone helping somebody else who is in difficulty, without demanding anything in return. Instead, in creative communities, relationships are based on some form of reciprocity where everyone involved is active in different ways.

The meaning of "community" changes deeply in the different contexts.

In the European experiences the communities we refer to are "intentional communities": new social organizations emerging from a long process of individualisation (and, largely, as forms of reaction to it). *Vice versa,* in emerging countries, the communities we refer to can be seen as a balance between continuity with still existing traditions (families, villages, neighbourhoods, etc.) and the innovation needed to face radically new conditions of life (and the challenges of sustainability, not just environmental, but also social and economical). In each country, this balance can be different, but in each one of them it will result in the up-dating of traditions, i.e. the use of conventional social organisations as building blocks for new forms of social network (in the framework of which collaboration, mutual help, sharing and, more in general, community building can be up-dated and re-interpreted).

The very interpretation of the terms *creative communities*, *social innovation* and *sustainable lifestyles* is key for understanding the different socio-cultural meaning of these initiatives in each context.

Community is the most critical term, appearing in Brazil as to replace the word "favela" (shanty town), for politically correctness purposes (R. Bartholo, UFRJ, Brazil, pers. comm. 05/02/2007). In India, *community* tends to have a connotation of traditional rural communities, as well as referring to one particular religious faith, whereas in China, there are different historical interpretations, including the delimitation of an administrative area by the government (Alice Lau, ICS, China, pers. comm. 24/01/2007).

The discussion of the role of creativity in contemporary society (and in a knowledge economy) is today very diffused worldwide (and in Brazil, India and China too). However, it has to be said that the notion of creativity normally used in the public discussions is quite far from the one we adopted when defining the concept of creative communities. As far as creative

[7] For example social incubators and other initiatives based on the solidarity economic approach have an important role in encouraging and supporting micro-entrepreneurship and community-based solutions aiming at re-establishing social fabric and wellbeing.

communities are concerned, the creativity we are referring to is not the creativity of experts (i.e. workers in creative industry) but it is the *diffuse creativity* that characterizes contemporary societies when oriented towards inventing collaborative solutions to everyday life problems and opportunities[8].

Particularly in India and Brazil, experts have pointed out for one of the possible reasons of this different interpretation, basically related to the understanding of creativity as an individual quality rather than a collective one. In India, (social) creativity is commonly linked to the notion of "juggard" (copy/hack culture) (A. Srinivasan, IIT Delhi, India, pers. comm. 02/03/07), which demonstrate a strong individual creativity but tends to stick to the "fix-it" level (S. Mehta, NID, India, pers. comm. 06/03/2007) and therefore very much referring to grass roots inventors (Honey Bee, India). In Brazil, “the notion of *creativity* has been given recently an individualistic emphasis: *creativity* as an attribute of the individual freedom”(R. Bartholo, UFRJ, Brazil, pers. comm. 05/02/2007).

Cases of social leapfrogging

In emerging countries, collaborative behaviour patterns still exist in different traditional forms (inside families, villages, neighbourhoods, etc). At the same time, main stream thinking on modernization, following the patterns of existing mature societies, considers that these living traditions are condemned to disappear, swept away by an “inevitable” individualization process.

On the contrary, through the *creative communities* perspective, we assume a different idea of modernization, where new forms of cooperative behaviour, creative communities, appear as cases of *social leapfrogging*. That is, as cases of social innovation where groups of people move directly (or, in any case, very fast) from traditional forms of collaborative behaviour to new ones, responding to needs of contemporary everyday life (avoiding the phase of extreme, unsustainable individualisation that characterizes existing mature industrial societies). We have assumed that in emerging countries, creative communities can be seen as a non linear evolution towards modernization, i.e. cases of *leapfrogging in the social development process*. However, these “leaps” require some ideas on where to leap: a new idea of wellbeing that must be perceived as better than the one achieved through a more linear process. If this is true, the kind of wellbeing that creative communities generate has to be perceived as better than that proposed by the normal “modern” solutions[9]. This means that this community-based and context-related wellbeing must be attentively and effectively communicated. And wider visions of what life could be like, if it were widely accepted and diffused must be produced.

In other words: effective communication and scenario building are crucial to give these promising cases the possibility to last over time and to spread. ***New design tools and new sensibilities must be developed to make it possible.***

3. Design Exercise...

One of the questions of CCSL was: considering the issues involved in improving and replicating creative communities cases, could the communication and design capabilities that have been applied in some European[10] cases be usefully adopted in the context of emerging countries?

[8] The EMUDE research has proven that the creativity of professional creatives, and that of creative communities are different. Nevertheless, it proved also that creative communities can generate a favourable context for the development of professional creativities.

[9] We must add here that, today, the perspective of creative communities must also be perceived as better than another (very dangerous) existing proposal: the one based on ultra-conservative ideas on identity and traditions.

[10] In Europe, associated to Sustainable Everyday project and EMUDE research, a number of events were held to promote the social debate around creative communities and collaborative services: seminars and publications and traveling exhibitions. For details, see www.sustainable-everyday.net

Most of these collaborative services observed are deeply local and nearly private initiatives: they are known only by the group of people that organize them. They have anonymously developed among a small community of users/producers who, very often, being quasi self-sufficient, do not feel many reasons to publicise to larger audiences what they are doing. This lack of visibility prevents these cases to be promoted (we hardly notice them around…) and slows down their dissemination (not being seen, they do not inspire replication…).

It results that, in order to promote them and express their potentialities in terms of seeds of possible sustainable lifestyles, it is crucial to improve their visibility. That is: to communicate effectively and to use them as starting points to build scenarios of sustainable everyday life based on the hypothesis of their possible larger diffusion and replication.

New roles for design emerge here: designers can help in giving visibility to creative communities initiatives assuming the role of becoming "project agents" of new sustainable solutions, conceiving and developing advanced solutions of collaborative services.

In this framework, CCSL proposed to design schools in Brazil, China, and India[11], to host a design exercise with students aiming at generating a set of scenarios, (the creative communities scenarios) of how life could be like in a society where creative communities, and the ways of living they propose, could spread in their culture. This design exercise, organized as three days workshops, introduced the participants to the notions of grass roots social innovation and collaborative services in the perspective of sustainable ways of living.

Participants were asked to re-compose these scenarios of sustainable lifestyles inspired by the promising initiatives collected by EMUDE and CCSL. To compose the new scenarios, they were exposed to samples of characteristic solutions, presented through a set of stimulation cards (each card containing an aspect of a collaborative service). This starting material has focused on three clusters of initiatives: new food networks, community housing and neighbourhood care.

The first design step was to "localise" service ideas, translating them into their own socio-cultural and economic structure, articulating these sample of solutions into new services for food (new food networks reconnecting urban consumers to the food they consume), housing (now co-housing models) and neighbourhood care (new forms of living and being in the public urban space).

Participants were asked to experience interaction with a tentative product-service system playing themselves the role of users (act-in) in their own scenarios. For that, they have produced a visual description of their context of life (the city, the neighbourhood, the house, its spaces and artefacts, etc). This process of visual documentation of the context of life of their user was used as a baseline for the following scenario building activity, through the construction of short visual narratives (photo-story) describing a character using a collaborative service. They have questioned his or her personal characteristics, motivations, expectations to take part in the service. At the end the selected narrative should capture the meaning of the service in user's daily life through a series of five to eight scenes. As a final instance, external users were interviewed after observing the results so to investigate in depth the potentialities and barriers for dissemination of the different collaborative services.

The results of these visualizations express in a concise and highly communicative way, new possible collaborative services that reflect contextual cultural norms and socio-economic systems in the countries where they were developed and provide interesting insights in terms of potentialities and barriers for proposing collaborative services in Brazil, India and China.

4. Tentative (partial) visions...

[11] The schools involved were COPPE / EBA Technology & Social Development Laboratory (LTDS) at Rio de Janeiro Federal University (UFRJ) in Brazil; the National Institute of Design (NID) in India (Ahmedabad); and the School of Design, Guangzhou Academy of Fine Art (GAFA) (Guangzhou) in China. In Brazil, a second workshop was conducted independently of CCSL at the School of Design UNISINOS University.

In the light of the main results described in section 2, we propose here a second level of interpretation of CCSL results, through the discussion of what emerges as the main characteristics of the collaborative services proposed by the design students in each country.

The results of these exercises are presented in the form of photo-stories (as described in section 3): a sequence of pictures carefully produced to represent a progression of events that constitute the proposed service (see figures 1, 2 and 3). We argue that the interpretation of the proposed services can provide valuable insights regarding the kind of service ideas that would be more likely to be adopted in each of the 3 contexts, helping on the construction of a rough map of need-areas and possible penetration of promising cases. Even if the photo-stories cannot be interpreted as such, since the solutions developed are too much influenced by the input clusters (the stimulation cards) and therefore do not pretend any generalization, they provide us with insights of collaborative services in each different cultural context.

India: From "service communities" to "promoted participation"

The different adaptation of the three service clusters by the Indian students seems to be characterized by a shift from a community that collectively set services for themselves to a collectivity that is participating to a collaborative service initiated and coordinated by a promoter.

In a 'spontaneous service society' like India where every opportunity to provide services is immediately implemented providing added value and employment, the hypothesis of collaborative services is first seen as a threat to income sources: a food purchase group organized and operated by families living in the same neighbourhood sounds a rather complicated and risky solution when the same service could be very efficiently provided by any of the vendors selling fruit and vegetable on carts in the street. The community most of the time pre-exists. People leaving in the same place, colony[12] or neighbourhood are a *de facto* community and it does not seem to be too complicated for them to become a collective employer, grouping to get for instance an organic food delivery service from the existing streets vendors.

This is the case for almost every aspect of urban everyday life, from food (street vendors, providers at your doorstep), to mobility (abundance of rickshaws and auto-rickshaws in contrast to poor infra structure of public transport), to clothing care (the washing wallahs, collective laundries) and beyond. In the " wallah" culture, there is almost always a service provider at your doorstep (Soumitri, G.V. and Srinivasan, A 2003).

If these services are frequently based on low resource intensity and avoid individual ownership of a range of goods/artefacts such as washing machines, automobiles, etc, they frequently rely on underpaid occupations. In effect, they relate to a severe demand for job opportunities and income generation in the urban environment (considering sheer migration flows from villages to the cities in recent decades, millions of poor and unskilled people moving into urban areas in search of livelihoods).

In solutions imagined by the Indian students, the collective gardens are characteristic examples of an evolution from these "services communities". The general scheme remains the same: a single operator on one side and a community of families on the other side. But the single operator is not anymore an employee performing the complete service: he becomes the promoter animating the initiative within the community. In one of the students' scenarios, an elderly retired man wishes to revitalise the use of traditional Ayurvedic medicine (see photo-story in the visualization section below). His motivations to come out with this new activity are related to the opportunity of regaining social and family acceptance and recognition through a new occupation. For that, he starts planting an Ayurvedic garden on the roof of one of the colony's buildings and involves other tenants in the enterprise. The community around is not then anymore a passive employer: promoting a vegetable orchard (see photo-story on www.sustainable-everyday.net/ccslproject) they collaborate to the initiative guided by the elderly: they take part to

[12] Residential neighbourhood typology in India.

the gardening activities, they help in harvesting, cooking, making preserved food and organising a collective meal... They participate in the solution guided by the initiative of the solution promoter.

In the ayurvedic garden scenario, where the retired man finds an innovative way of animating the community (and creating social value), the street vendor is out of scene. One could argue that in this new scheme, he looses his role as provider and ultimately his source of income. After all, the retired man living in a colony comes from a middle class person, and the street vendor probably comes from a less privileged social position. They are not equivalent social actors, when it comes to having access to similar infra-structure that allows for example the retired man to have a roof top available for his ayurvedic garden. It might not be the case for the street vendor to have access to such a space.

A challenge for the spread of collaborative services in this context derives from the complexity and diversity that characterises the Indian society, notably its deep social inequality. It will have to consider how to reach social actors such as the street vendor. If instead of a private rooftop, he could count with a public space, then it could become a solution that caters this public, favouring social aggregation and generating social value.

Even if challenging in some aspects, the perspective of integrating collaborative services and micro-entrepreneurship opens up interesting opportunities. Another scenario proposed by students proposes a similar situation, but here the social roles are not so marked (as in the case of the elderly wishing to regain his social status). It is just a group of people who decide to organise a purchase group to obtain organic produce. In this new food network solution, street vendors could play an important role, even becoming the promoters of a direct food chain. Their work would gain an improved value and more guarantees since it becomes systematised and part of an organised scheme.

China: From "institutionalized collectivism" to "open collaboration"

The adaptation of the initial set of cases proposed by the Chinese students seems to be strongly influenced by the past forms of institutionalised collectivism that constitutes a positive background for implementing new forms of more open collaboration.

During the past decades China experienced many forms of institutionalised collectivism that at the citizen level induces everyday life solutions based on the sharing of goods, use of collective spaces, local-based forms of organization, etc, experiences thus similar to the set of cases showed to the students, through the stimulation cards. A parallel of the Chinese mindset can be traced with other countries that have also experienced a long period of collectivism such as Central Eastern Europe, that react with some reluctance collective-based solutions (Vadicovic, 2008).

Although China, since the first steps of economic opening, has been showing a massive rush towards western lifestyles, consumerism and individualism, the reaction of the students were fairly positive towards the creative communities cases and their ways of doing. And they have demonstrated a true spirit of 'open collaboration' when designing their new scenarios, by proposing clear bottom-up services: tenants of a building decide to install themselves a garden on the roof terrace of their building (see photo-story in the visualization section below), a young couple decides to share their car (see photo-story on www.sustainable-everyday.net/ccslproject). But the kind of collaboration that emerged is also partly top-down The presence of the state is also required as part of the proposed solutions, for example to incentive (or allow) forms of exchange between neighbours, to subsidize initiatives of public interest such as green roofs or simply to check that installing a garden on a roof top does not threat the security of the building structure.

Even more, the solutions seem to demonstrate both a particular interest and a clear competence in organising part of the daily life on a collective basis. Great part of the motivations mentioned by the students that would lead to the creation of a collaborative solution is related to the lack of socialization deriving from the booming urbanisation process. In the traditional

Chinese society, the family is the ultimate social and economic unit, the main form of organization (Leong, 2008). With economic growth and particular rapid shift from rural to urban environment (migration from countryside to the cities) the new urban population faces a serious problem of social displacement. The disadvantage of comfortable apartments in high-rise buildings is the difficulty to make friends, especially considering that newcomers are often cut from their previous social contexts. Exchanging mutual help between tenants, sharing a car between two families is seen as a way to meet new people and make friends.

More than in the two other countries, the students demonstrated a capability to handle problems raised by collective living or sharing goods: a garden in a rooftop is nice but not all the building tenants can enjoy it at the same time. A chart is placed in the stairs enabling the families to organise its use in turns. In the same way as portrayed other scenarios, the system supporting the exchange of mutual help between the tenants in a high-rise building is part of the building infrastructure placed in the building entrance hall; sharing a car means first to agree and sign a contract between the two parties. The resulting 'open collaboration' is based on both the initiatives and the competences of the individuals to organise collaborative services.

A recurrent bottom-line present in the scenarios/photo-stories developed by the Chinese students can be perceived in the realm of “personal benefit”, in other words, solution addressing physical and mental wellbeing related to problems such as urban loneliness. Virtually all the solutions proposed offer the opportunity of socialization as the main or additional benefit for the main functionality addressed (food, mobility, etc). It emerges that collaborative services’ greatest potentiality in China can be related to this aspect of promoting socialization in urban environment, connected to the “intimate ecology” (Leong, 2008) of the self, as one important potential area in the Chinese context.

Brazil: From "spontaneous sociability" to "structured collaboration"

The adaptation of the proposed set of promising initiatives by the Brazilian students seems to be characterised by profiting from the spontaneous socializing skills of the population to set more structured collaboration and initiate collaborative services in the everyday life. This spontaneous sociability is a fundamental trace of Brazilian ethos and can be related to the notion of the “cordial man” (Buarque de Holanda, 1936), synthesis of the friendly and informal character of Brazilians, where relations of an organic and communal character based on family relations, neighbourhood, and friendship prevail over any form of impersonal or mechanical ordering.

If in one hand, this socio-psychological characteristic leads to an apparent easy and friendly social environment, in the other hand it tends to oppose to anything structured, an uneasiness in accepting and following rules that ultimately determines all forms of organizations and institutions, that after all are present also in the collaborative services. Besides, if a natural socialization seems at first sight to be an obvious characteristic of public life in Brazil to the point of becoming a cliché, it seems to operate mostly at the surface of the social life, outside, in the street. In the private sphere of everyday life, in the setting of the habitat, people tend to live on a more individual basis and even exposed to isolation and alienation.

Many of the solutions imagined by the Brazilian students try to match these two issues and make use of this spontaneous sociability to prompt a more structured form of collaboration in the everyday life. Amongst the different results of the design exercise, the most characteristic example of this attitude is probably the scenario “the sweeping band” (see photo-story in the visualization section below): the natural inclination to meet with friends and play music in an informal way is made functional, instrumental to organise the cleaning of the neighbourhood’s streets. Participants playing the music are entertaining the others sweeping the streets and gardening public green. The result is probably a not very efficient operation: the band goes up and down the streets according to the mood of the music, not cleaning systematically but enjoying a mix of both superficial and structured collaboration.

The other examples of setting up shared spaces in existing housing structures or healthy shopping and cooking groups (see photo-stories on www.sustainable-everyday.net/ccslproject) are also based on the same dynamic. A group of single students rents together a supplementary room on the same floor with the main purpose of creating a collective space or an enlarged living room where to meet and socialise, something they could not afford in their respective flats. The members of the healthy diet network connect and exchange tips through the Internet but this networking is obviously functional to the pleasure of shopping, cooking and enjoying a meal together.

This pervasive mix of superficial and structured collaboration exposes both the potentialities and limits of collaborative services in Brazil, related to the basilar dichotomy of the country's social, cultural and psychological norms. Structured collaboration will work better if at least in appearance it looks more like a game, not a rule. The relational qualities that emerge from this form of collaboration may be of a high level and contribute to the improvement of social fabric, or not. Conversely, for any solution to be successful from the point of view of its functionality and performance (as the resolution of a problem, i.e. the streets need to be cleaned) needs to rely in some form of systematization and organization capacities that depends on each participant being able to assume a certain level of responsibility and commitment.

The historical traces of "informality, innocent liberty, labor as a game, indiscipline, rejection of labor as an obligation, lose sociability and unpredictability" (Ianni, 2005) are considered to some extent, as a myth of the past but also acknowledged as the reasons for a historically weak civil society. These characteristics can however be interpreted also as positive when seen as a fluid and open social dynamic where diffuse creativity can flourish and spread. In fact, a more positive picture may be traced in the face of contemporary transformations, for example, on how society has been appropriating of new technologies and their participative and relational possibilities.

5. Conclusions...

Within the design research framework, the results offered by the design exercised have in great measure complemented and refined what has emerged from the process carried out with experts (researchers from many areas, NGOs, civil society operators, etc) in Brazil, India and China. It has been an effective approach to contextualise some service ideas into social, economic and cultural particularities of the three countries, based in the knowledge of some cities.

In these emerging countries, creative communities are found in a grey area, blurred with other bottom-up initiatives and attitudes traditionally linked with basic needs and income generation. The visualisations produced through the design exercise, have for example indicated fresh perspectives for linking collaborative services with micro-entrepreneurship, expanding the late towards a collaborative and collective model.

They have also pointed other important factors that come to play for the spreading of collaborative services, revealing non-obvious social and cultural aspects. The demand for an improved sociality among neighbourhoods, the sense of belonging to a community and creating social connections are issues normally attributed to industrialised countries, immersed in a deep process of hyper individualisation, as observed in Europe by the EMUDE research. The design process has suggested that these are phenomena that appear to have a significant weight also in the urban environment of emerging countries, even in those that are widely acknowledged by spontaneous socialization.

As in the previous European research (EMUDE), the design thinking has been decisive for the research process in CCSL, founded upon systematic collection of information, production of text and visual results. In CCSL, the design approach was valuable and decisive for contextualising service ideas and communicating them back to society, helping to give a concrete form to visions of well being, essential to promote the desired social leapfrog towards a sustainable society.

Next steps…

The results of CCSL in Brazil, India and China have opened up new opportunities to discuss creative communities and promising cases as new models of sustainable lifestyles at a worldwide scale. The next step to CCSL will be to verify if this attitude exists and is workable in Africa. And if yes, discuss what would be the form and particularities that these concepts can assume in the African continent, with a special focus on its emerging urban societies.

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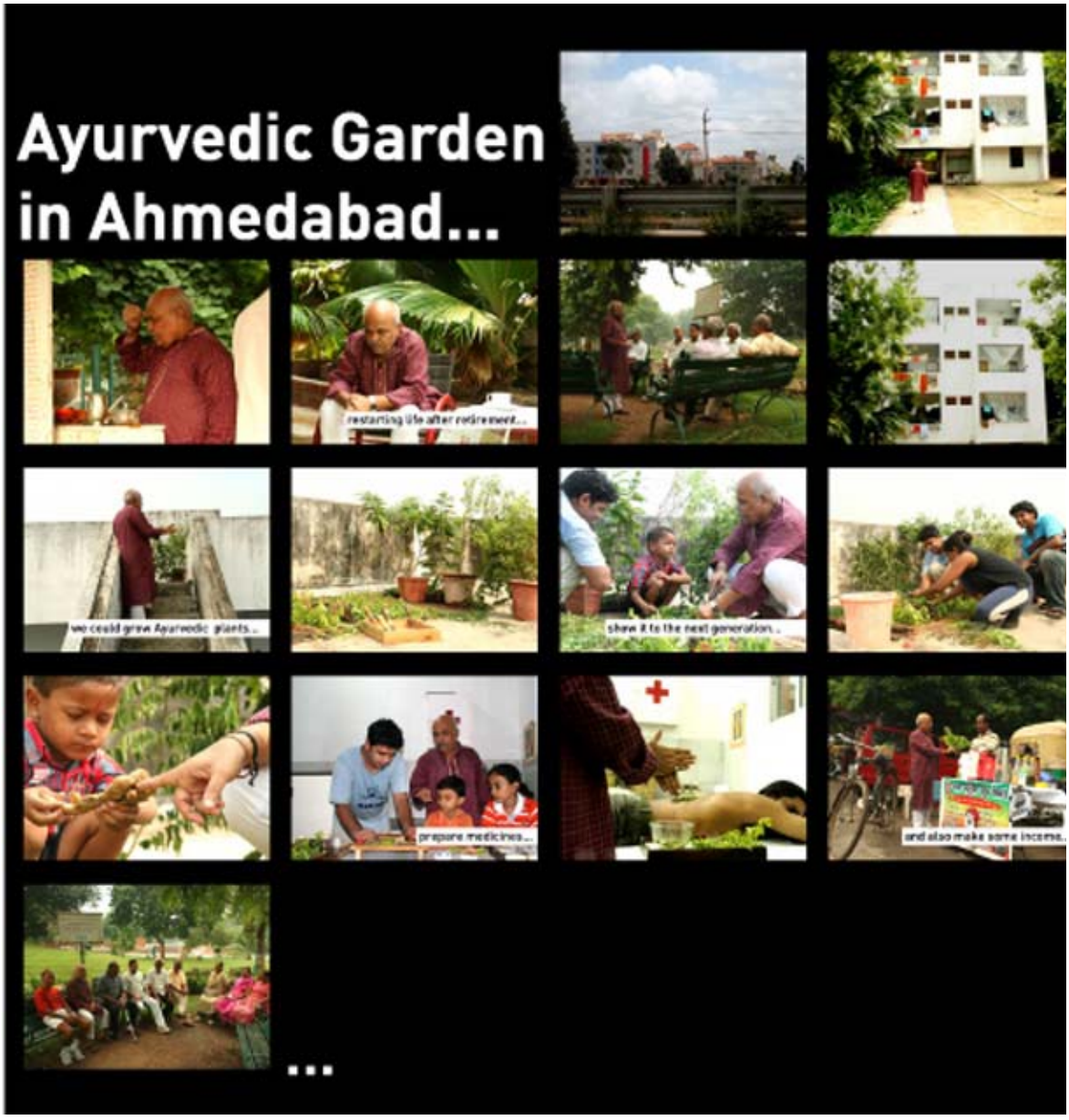

Fig. 1: Photostory produced by students from the National Design Institute (NID), Ahmedabad, India

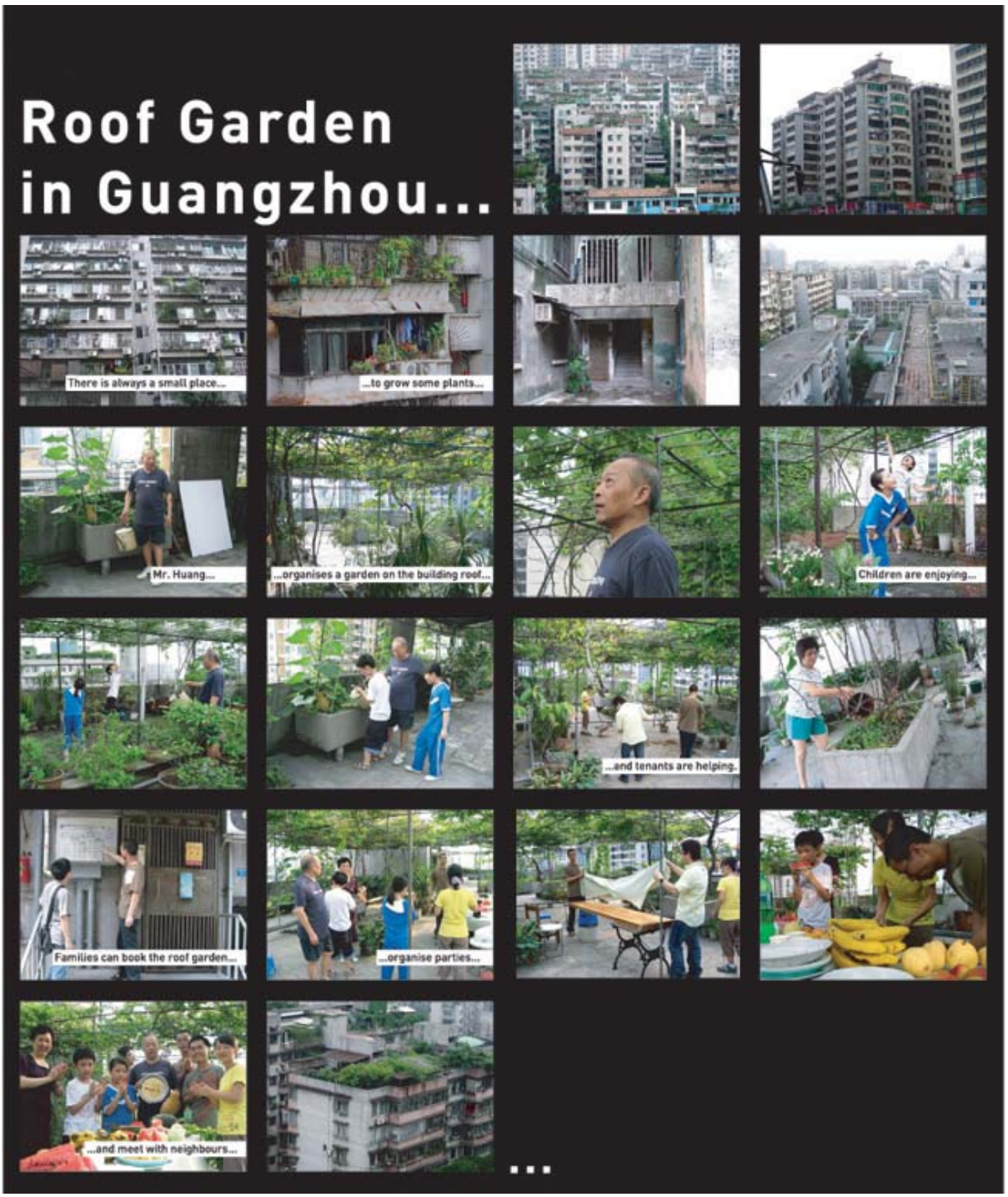

Fig. 2: Photostory produced by students from the School of Design, Guangzhou Academy of Fine Art (GAFA), Guangzhou, China.

Fig. 3: Photostory produced by students of the Rio de Janeiro Federal University (UFRJ), Rio de Janeiro, Brazil.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Transport in a systemic perspective

How can we change attitudes and behaviours in people?

Rebecca Pera[1]

Abstract

The article investigates transport mobility of an industrial area close to Turin (Torino Ovest Produce), which includes 30 enterprises with 2500 employees. The project, financed by Regione Piemonte, aims to reduce employees' private transport by encouraging the use of public and collective transport. The work highlights the need for sophisticated qualitative and quantitative research data as the basis for the implementation of an innovative systemic design methodology.

In specific the present work outlines possible answers to the following research questions: is it possible to change collective transport behaviours? What kind of marketing strategies could encourage behavioural shifts?

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1. Aim and theoretical introduction

The general goal of the work is to propose a theoretical model of alternative transport for industrial areas. The study intentends to provide an answer to a research question which has not played a crucial object for many other studies (Steg et al. 2001): which elements of a mobility system's design are particularly significant in attitude and behavioural shifts? In practice, in relation to the individual component of transport, research usually focuses on needs (depending on age, income, education level, houseld situation, etc.) and abilities-opportunities (depending on people's phisycal condition, etc) and it is generally measured with a utility-based perspective which analyzes the economic benefits that people derive from access to spatially distributed activities. Utility-based approaches assume that travellers respond to initiatives in a strictly rational manner (the increase of the prize in petrol will lead to behavioural shifts). The present thesis focuses on the "softer" aspects of the decision process (mental models, attitudes, needs) which are rekoned to be crucial in changing behaviour. Given the socio-economic population characteristics, people's opportunities and behaviours are co-determined by attitudes. These, in turn, are influenced by both affected-reasond factors (e.g. status, privacy) and instrumental-reasoned factors (perceived costs and benefits of travel) determined by the transport system (Steg et al. 2001).

This approach intends to benefit especially three categories: individual employers, the enterprises of the analyzed area and finally local community. The first will benefit economically and socially, the second will have the chance to communicate the will to be concretely socially responsible, and will have the possibility to enhance employees' belonging feeling to a community and their overall job satisfaction. Adopting a transport plan may lead to tax reductions for enterprises as well. Finally the system will be effective for the community by reducing pollution, road congestion and by enhancing road safety. The general aim is to improve quality of life. The applied outcome of the thesis will be the basis for systemic design, and will focus (this phase of the research has just begun and will be accomplished within a year) on the qualitative relations proposed in this work, which will be developed according to non-linear processes.

The paper is articulated in the following parts:

- Knowledge value on consumer behaviour in design strategies;
- Presentation of a case study (object, phases of the research, presentation of the main outcomes)
- A set of possible ideas to be developed in the design phase
- Needs, attitudes and behaviours referred to transport
- Communication strategies
- Directions for pursuing further research

2. Consumer behaviour analysis

Information and knowledge play a central role in customer orientation and are essential for the design of a product-service. One reason information is valuable is that, in general, we don't know as much we think we do and what we think we know is often wrong. One clear example of not knowing as much as we think we do is overconfidence. Typically when we forecast, we place too small a range around a forecast (view examples in Mahajan 1992). However, to focus on aspects useful for the present issue, what kind of research methods are generally applied to study consumers and gather information?

When using a scientific approach it is essential to start by an assumption: no scientific method is the very best, every research system is functional to its goals. Each research hides a thinking system that should have a scientific base, clearly declared.

Before presenting the methodology that has been designed for this study, it is advisable to synthetically present the key characteristics in quantitative and qualitative research methodologies.

In order do get to know consumers or potential ones, quantitative, qualitative and creative methodologies have been used, each characterized by shortcomings and advantages.

– **Quantitative methodologies** are substantially made of questionnaires with closed-end questions. The aim is to evaluate the presence and the extent of a given phenomenon. Therefore, representative samples of the population of interest are surveyed. Generally, however, they get interviewed on a certain matter only once. The advantages of this approach are represented by the statistical criteria used in order to allow predictive and statistically representative data concerning certain behaviours or attitudes. The limits of this methodology concern the superficial way of data collection, a factor connected with a significant need to simplify the questions in order to be understood that doesn't however allow a deep comprehension of a certain phenomenon.

– **Qualitative research** is an important source of insight and, on the contrary, are represented by in-depth psychological and motivational interview techniques, generally applied through direct meetings with single clients or groups. The advantages of qualitative methodologies consist in being able to survey in-depth a phenomenon, by identifying its causes and providing strategic instructions for planning product/service and communication improvements (these elements cannot be collected through a quantitative methodology). The limits of this approach lay in the fact that it is impossible to represent a phenomenon from a statistic point of view and, therefore, it is impossible to weigh and extend the obtained data to the population of interest (Vannoni 2002, 27).

– **Creative methodologies** are a particular version of qualitative techniques. The aim is to stimulate the ideas of a group of people (customers often) in order to identify possible new services and communication strategies. They represent a very sophisticated strategic tool, although they also have the same limits of qualitative research methodologies (Pera 2005, 177).

3. Case study: research object

Almost 30 small-medium enterprises are based in the area and great commercial and industrial expansion is forecast for the near future. At present approximately 2500 people commute everyday. The study has taken in consideration employees' means of transport and the scripts they tend to adopt (behaviours, habits, routes, stops) analyzing weaknesses and opportunities. Softer aspects have also been investigated such as motivations, beliefs, attitudes towards private and public transport.

Partners of the study

Regione Piemonte has financed a two-year research programme in which our department (Industrial Design – Faculty of Architecture – Politecnico di Torino) is project leader - transport agencies (GTT Spa, Car City Club) and local municipalities (Pianezza, Collegno) are also partners of the project, which has been coordinated by CAA (Consorzio Artigiano Autoriparatori).

3.1 Research phases

The research is structured in two years: the first is dedicated to a quail-quantitative data collection, the second, which has just started, focuses on the application of a systemic design approach to the issue. The first part has been carried out through the following steps:

First year (ended in April 08)

1. Analysis of opportunities and weaknesses of the area considering its accessibility and mobility;
2. Survey instrument: picture of employees' present mobility and propensity to take into consideration public transport and collective mobility.
3. Depth interviews on entrepreneurs and CEOs of the firms based in the area.
4. Qualitative group sessions: creative solution development with employees and transport experts
5. Design of possible guidelines related to the major attributes the system should have

Second year (by march 2009)

1. The next steps of the research are the following ones:
2. transport flows analysis from a systemic approach;
3. strategic multi-modal interchange knots;
4. technological evaluation;
5. *governance* and economic analysis;
6. multifunctional services design (number of vehicles, modalities…);
7. marketing and communication strategies.

3.2 Outcome of the study

The site's description: opportunities and weaknesses

In order to approach the topic of enterprises mobility in the most effective way it is necessary to frame the geographical area in its complex and start to describe its general accessibility. The terms "access" and "accessibility" in the literature are often used indiscriminately. Here, access is used when talking about a person's perspective, accessibility when using a location's perspective (Greus 2006, 22). Focusing on the passenger transport, we define accessibility as the extent to which land-use and transport systems enable (groups) of individuals to reach activities of destinations by means of a (combination of) transport mode(s) (Greus 2006, 201). Although the study focuses on the aspect of transport systems related to accessibility, land-use and urban policy making play a crucial role which should be also taken into account (that would however broaden excessively the present thesis). This would allow an even deeper understanding of why people (85%) use private transport and what could be planned to reduce the number.

The area under study is characterized by a land-use system that mainly comprises factories, offices, and shopping centres. The area is linked to a "nature area" (Parco Dora) whereas locations for houses, schools, leisure activities, etc. aren't present (very low diversity). The area of analysis can be easily located due to its concentration - it is bordered by two major roads (high-ways and free-ways) which allow a positive assessment of its location (studies on the location preferences of entrepreneurs and empirical analysis of firm locations in Europe have indicated distance to road and railway infrastructure as an important location factor (Bruinsma and Rietveld 1997; de Bok 2004). The area is at a 10 minutes from the centre of Turin (Porta Palazzo) by car and it is highly accessible by private transport. Other all a great availability of parking spaces within the area encourage the use of car. High car accessibility and no problems in parking spaces encourage the entry of 2000 cars a day.

Poor connections to public transport

In order to promote change behaviours from the use of car to the use of public transport it is certainly necessary an improvement of the latter.

During each phase of the research this aspect has been perceived as the most critical. The connections between the main areas from which employees come from and from possible strategic changing points (underground final station, bus stops…) to the industrial area appear very poor.

Negotiation has begun with transport agencies with the aim to ask better direct connections to the area.

Problems in pedestrian connections to bus stops

A negative perception of public transport accessibility has also been favoured because of poor pedestrian crossings, lighting, sidewalks… These elements increase risk perception, especially during certain moments of the day.

A flow analysis of the area in order to design different paths would be advisable. These should differ in regard to:

- goods flows;
- cars flows;
- pedestrian flows;
- cycle flows.

The demand of mobility: quantitative data on potential consumers

The quantitative survey intends to synthesize data useful to represent significant elements for the design of the services. Data collection has been carried out through professional interviewers who operated personal interviews, somministrating the questionnaire directly to respondents. A significant sample has been investigated (more than 10% of the universe of reference – 250 questionnaires over a total of 2300 labour force). Service demand is constituted by the following variables, which are a result of the structure of the questionnaire.

The client of the service: the majority of employees are young people: 60% is under 40 and 30% is between 40 and 50.More than half has a high school qualification (60%) and only a small group has achieved a degree (14%).

Scripts and behaviours: more than 60% of the sample arrives from the near municipalities, the remaining live in Turin. 70% takes 30 minutes and 22% less than 15. Average distance between origin and destination is 10-25 Kms. 65% of the sample goes directly to work, the remaining percentage stops during the journey to work because of children to drop off, or errands to accomplish on the way home. 85% gets to work alone with private means of transport; 15% with public transport because without alternative choice (they do not own a car).

Willingness to change patterns and modes: who travels by car perceives public transport insufficient (45%). Car ownership is associated to freedom, comfort, time-saving. Respondents declare a non-use of sustainable transport because of poor infrastructures. Public transport would be a possibility if the area was better served and if they could access to economic benefits on annual fares. 35% is willing to shift to car pooling at the following conditions: if the service is organized by their firm, if the journey takes not more than a time and half referred to the present one, and if the know the people they would share the journey with.

The demand of mobility: qualitative individual interviews on enterprises

As a result of the qualitative interviews carried out by professionals on owners and CEOs of the firms based in the area, a critical aspects seems to emerge: a medium-low perception of the problem. Mobility appears to be a problem, which however has little to do with enterprises. The possibility of perceiving mobility as an opportunity for the firm which has a way to communicate social responsibility to collectivity, to enhance employees' satisfaction and therefore productivity does not occur (with a limited number of exceptions) in the research. An extrinsic further aspect to the theme of mobility and accessibility but however relevant to the general goal of the project, is firms' low sense of being part of a system. The 30 enterprises tend to think individually instead of approaching problems and issues as a system. This is why many problems have yet not been solved (security, rubbish…): the enterprises based in the area are generally small (or medium) and this means that generally speaking there is a lack of competences/organizational/economic power, necessary requirements to approach this kind of topic.

The system in this case should also include:

- public institutions (municipalities and regional government);
- transport agencies;
- employees.

The demand of mobility: analytical-creative group sessions

We have chosen, as methodology[2] for this part of the study, a set of techniques which integrates linguistic cognitive techniques with creative/prospective ones in order to understand

[2] We suggest for further readings, the following texts:

Floch J.M., 1990, Sémiotique, Marketing Et Communication. Sous Le Signes, Les Stratégies, Presses Universitaires De France, Paris.

Greimas A. J., 1983, Du Sens II - Essais Sémiotiques, Seuil, Paris.

Greimas A. J. e Courtés J., 1979, Sémiotique: Dictionnaire Raisonné de la Theorie du Language, Hachette, Paris.

Greimas A.J., 1976, Sémiotique et Sciences Sociales, Editions du Seuil, Paris.

Pera R., 2005, Intuizione creative e generazione di idee, Utet, Torino.

values, expectations, needs, attitudes and mental models of the people under study in relation to the present issue. Participants were a mixture of employees of different firms and mobility experts (14 people). The session lasted 4 hours and it took place in March 2008 in a room offered by TOP – the public company for the development of the area.

The scientific covering laws of this methodology are drawn by structuralist semiotics and by neo-cognitive and neo-functionalist psychology, and refer fundamentally to the fact that mental models produced by respondents in relation to the topic under study, are the base from which the subjects create their attitudes and produce certain behaviours. We cannot think of this methodology as predictive of a certain behaviour, it has, in fact, a descriptive function.

The session has been organized in two phases:

Cognitive and linguistic phase

1. Individual presentation
2. Cognitive map on mobility to the area
3. Analytical discussion on weaknesses and opportunities
4. Discussion on the most significant quantitative data

Projective/Creative phase

1. Creative cards on possible solutions (car pooling, enterprises' shuttle, car sharing)
2. Collage on enterprises' shuttle
3. Collage on car pooling
4. Final discussion over the proposed ideas

3.3 A set of possible ideas to be developed

As it would not be possible to include in this presentation the application of every technique, a selection of the results will be presented. The participants have generated a number of ideas that can be grouped in three main categories: enterprises' shuttle, car-pooling, car sharing. For each category a description of the main attributes (positive values) and weaknesses will be given with a set of possible incentives and possible route flows.

Enterprise shuttle

This way of transport slightly reminds of the traditional school bus. Two versions have been proposed: the first imagines a service that picks employees up directly from home and takes them to work; the second aims to individuate a few strategic points (underground's final stop, a stop in the near municipalities, the roundabout near the area…) and link them to the different enterprises based in the area. The vehicles should therefore be small-medium sized able to be travel easily (stops should be few and not take long) and the presence of added services (air conditioned, tailored lighting, TV, Wi-Fi, possibility to book electronically ones shopping on board…) allows this mode of transport to be superior to the use of private car. The group perceives this service as highly innovative and positive also for its social benefits: home-work-home commute becomes a social moment and the vehicle could provide stimuli to the clients (a selection of books, CDs, audio-books on promotion by the shopping centres of the area). The core aspects of the service must be efficiency and reliability able to build trust. In order to provide a fast and precise service an accurate analysis of routes is required. An other attribute of the service is multi-functionality. The shuttle would benefit cost wise if used flexibly (it could be used

Vannoni D., 2001, *Manuale di psicologia della comunicazione persusiva*, Utet, Torino.
Vannoni D., 1998, *Della pubblicità, mente contesti, mondi immaginari*, Giappichelli, Torino.

by employees at certain hours of the day and to pick up customers of the commercial activities at others). The product-service provides a strong feeling of being part of a community and this element should be emphasized by communication and marketing strategies. A group of aspiration is often represented, constituted by individuals who actively make a choice, different from the majority's one. Employees are part of an ethically important project able to communicate social responsibility and sensitivity to environmental issues. The main barriers to the success of the service can be grouped in two areas:

– Cultural barriers: the object "car" still carries a strong symbolic meaning especially for individuals who have a strong need of status and ostentation.

– Economic-organizational barriers: great problems due to the average size of the enterprises based in the area for which it is not easy to face individually the issue under study. This thesis will theoretically develop the first category.

Possible incentives

A few benefits have been proposed:

– Coupons, free samples to be spent in the shopping centres of the area;

– Flexible working hours (entry and exit times) for who participates;

– Possibility to buy products in promotion by the commercial centres of the area.

Possible flows

In order to efficently design the service a number of strategic pick-up points should be individuated where employees will be collected and taken to work. Afterwords the shuttle could be used to take customers from the near municipalities to the shopping centres of the area under study.

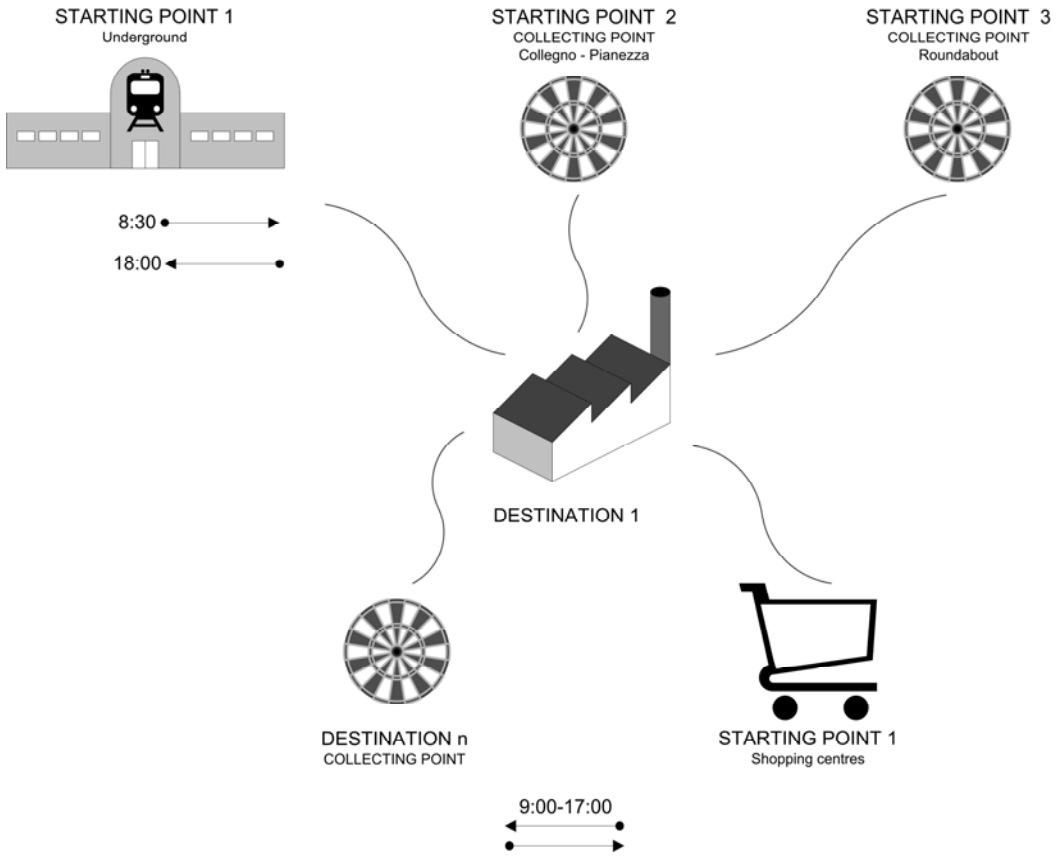

Fig. 1: Enterprises' shuttle flow

Car pooling

Car pooling intends to favour the development of automobile aggregation forms on daily routes. It allows car number reduction and related parking spaces. A cost reduction on petrol and overall pollution decrease is also evident. The goal of the session was to focus on strenghts and weaknessess of the system in order to understand and elicit how to seccesfully apply it to the investigated area. The survey has provided data that has been investigated throughly during the session. 34% would be willing to share the daily journey to work with collegues at the following conditions:

- Knowing the collegues they would share the journey with (39,3%);
- If the firm they work with organizes the service (24,6%).

The group has provided insight over the *present scenario* of individual travelling alone to work:

- Journey in loneliness;
- Higher costs;
- Stress due to traffic;
- Tiredness due traffic jams and accidents risks.

The group has imagined a possible scenario with the following benefits:

- Collegues company;
- Shared costs;
- relax;
- freedom to do something else (reading…).

The group states the need of a coordination unit able to manage the system and provide an answer to the main rigidities (travelilng only with known collegues) and manage also the economic aspects (embarassing for many). The connection between participants could be assured by the following tools: web site, e-mail, call center, sms…

Possible incentives

- Vouchers to be spent in the shopping centres of the area;
- Flexible working hours (entry and exit times) for who participates;
- Vouchers to enhance the category of insurance contracts;
- Discounts for changing ones car with an environmentally friend vehicle;
- Special parking spaces for car-poolers.

Possible flows

A possible flow is here proposed. A car pool car starts its route from a home 1, picks up a collegue at its home 2, and afterwords picks a third member up from an other strategic point (underground, railway station, roundabout close to the area…). The journey goes on dropping off one member at firm number 1, then firm number 2 and finally arrives at firm 3.

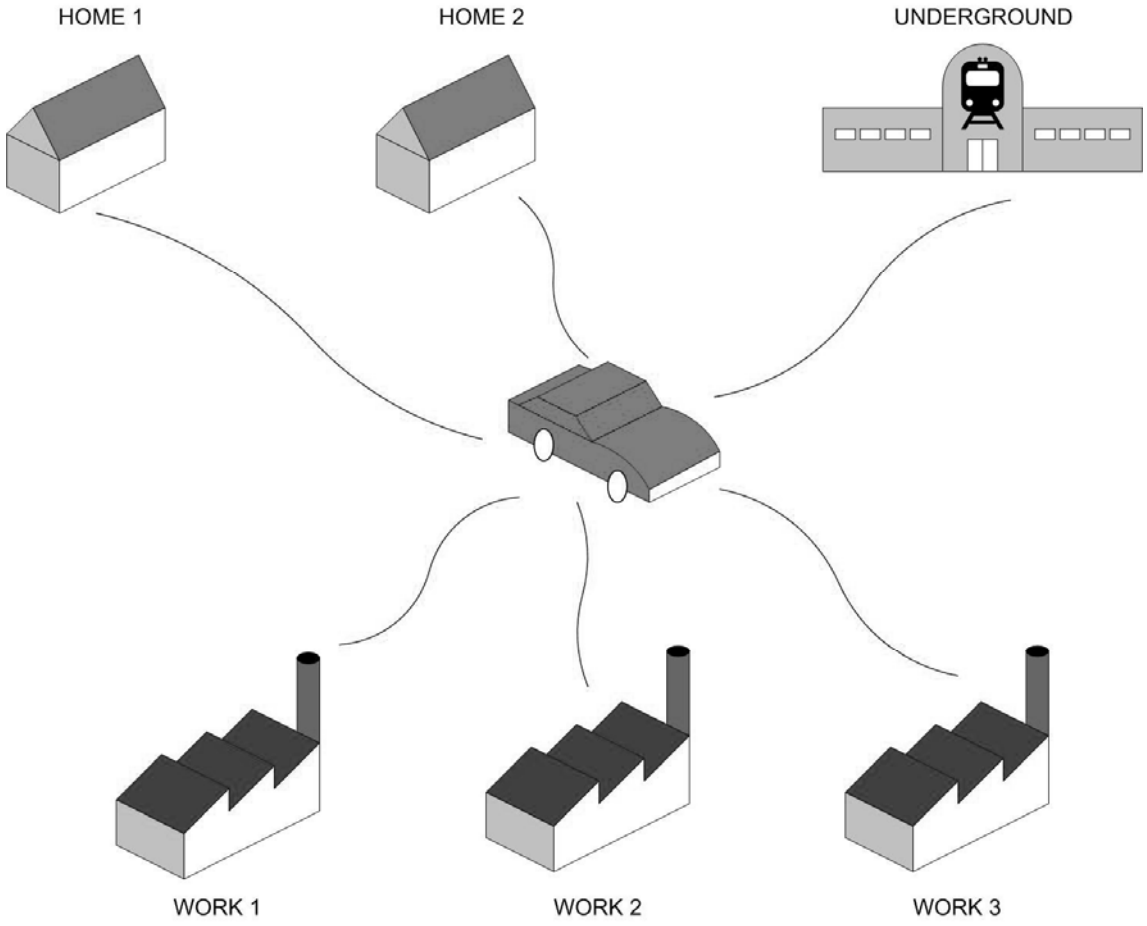

Fig. 2: car pooling flow

Car sharing

Car sharing is a service that permits the use of a car when reserved, picking it up and dropping it in a parking close to home, or work place and paying for the service received. This service is applied within sustainable mobility policies in order to encourage the shift from ownership to consumption. Automobile is no more a good but should be considered a service. Car sharing with environmental friendly cars could be usefull for:

- Professional commutes within firms (dfferent nature errands);
- Employees' work-home-work journeys;

This could be possible with the constitution of new "car sharing" parking spaces near the firms' location and homes.

Possible incentives

- Free CARD for the employees of the firms that have joined the project;
- Free annual fee for the employees of the firms that have joined the project;
- Flexible working hours (entry and exit times) for who participates;
- 20% hourly discount;
- 10% discount in relation to the fee one pays per Km.

Possible flows

A possible flow is here proposed. 1) A car sharing vehicle is used by a firm for professional movements and will be parked at the end of the day at the firm's parking space. Enterprise pays for the time and the kms for the "work-to-work" movements; 2) at the end of the day the employee picks the car up at work and goes home: he/she pays for the time and the Kms "work-home" he/she has used; 3) employee can use the car for leisure purposes during week-ends: he/she pays only the Kms he/she has done; 4) employee picks the car up at home and goes to work: he/she pays for the time and the Kms "home-work" that have been used.

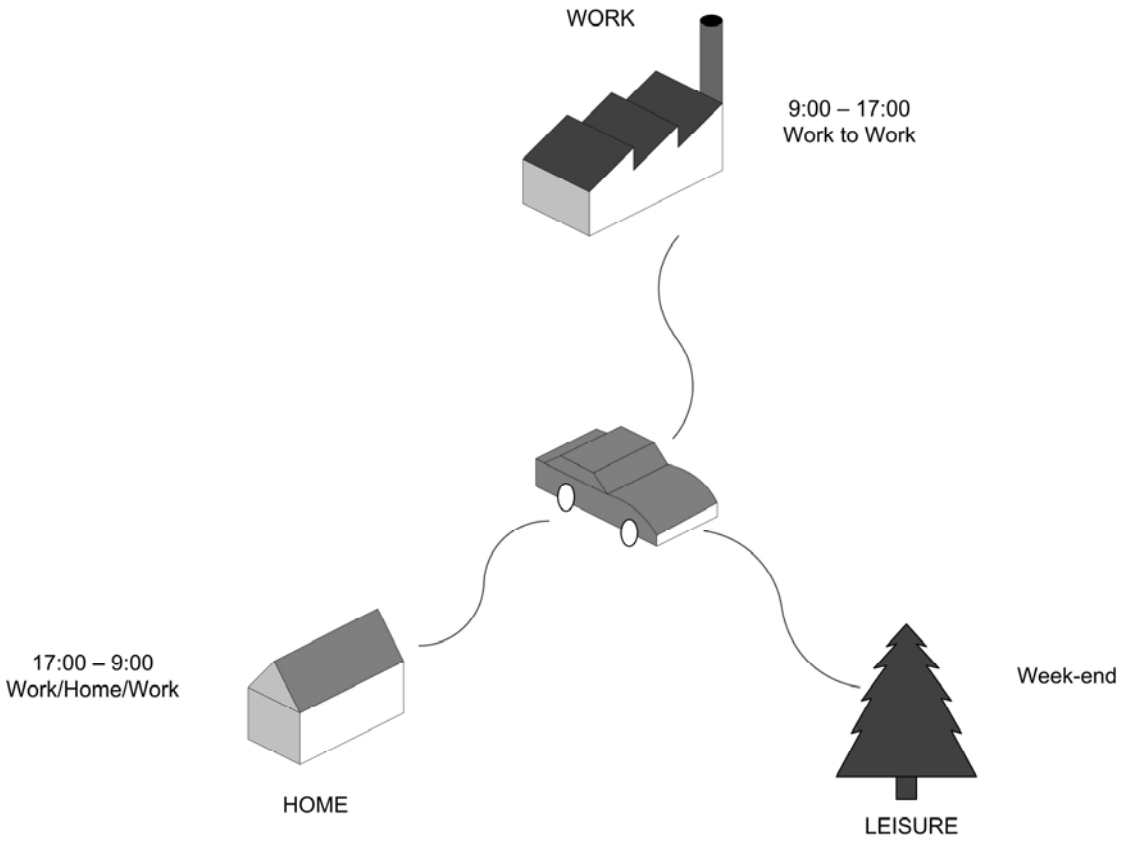

Fig. 3: car sharing flow

4. Needs and attributes of artefacts

It is possible to individuate the most significant attributes the artefacts above described should deliver in order to satisfy a number and level of individuals' needs which have emerged in the study. On one side a basic level of need (*functional-critical need*) emerges and is satisfied when the service is able to guarantee **efficiency** and **reliability** (time saving, cost saving…). On the other side, more abstract and emotional needs are evident: *social needs* that can be satisfied if the service favours a sense of **belonging**, community cohesion, social inclusion. At a *symbolic level* the attributes of the service should give importance to appeal able to create **desire**. The final level, the least tangible, is the one related to *self-fulfilment*, or the possibility to develop a human, very personal side of oneself. It implies an active change in behaviour opposed to the majority's one, endorsing a project that should be perceived as highly **significant**.

4.1 Attitudes and behaviours in transport

From a marketing perspective product-service innovation can follow two different processes: the first defined "technology push" that means that the initial creative process has been

processed within the company (usually r&s department) and then launched or "pushed" towards the market. The second strategy is called "market pull" and it implies that innovation is demanded, generated and defined by consumers (through market and consumer research) (Lambin 2004, 272; Lambin 2008, 12). The system we are proposing stands in the middle of these two processes: it is a "broad" concept of market that is demanding a shift in transport behaviour (stakeholders, public institutions, opinion leaders, green associations…). Strictly speaking demand is not generated by individuals (employees) who are, infact, generally quite satisfied of their private way of commuting. On the other side, potential consumers have been the centre of the system design which will generate its creative process by analyzing and taking into great considerations present consumers' needs, perceptions, values. The company (in this case we are referring to a mixed group of public institutions and private companies) will have to "push" the system because it will not easily be accepted (the main obstacle is defined below). The present approach is defined a societal marketing perspective: according to this concept marketing should be able to deliver superiour value to customers in a way that maintains or improves the consumer's and the society's well being (Kotler, Armstrong 2001, 20).

The major problem the services (enterprise's shuttles, car pool, car sharing), described in the previous paragraphes, could encounter if launched, are strong cultural and psychological barriers which represent a significant obstacle in the adoption and use of the system. And this leads us to attitudes, which can be defined as an enduring organization of motivational, emotional, perceptual, cognitive processes with respect to some aspect of our environment (Petty, Wegener, Fabriger 1997, 609-38). It is learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object[3]. In relation to the issue of mobility it is useful to consider attitudes as having three components: cognitive (beliefs), affective (feelings), and behavioural (response tendencies). All three attitudes components tend to be consistent. This means that a change in one attitude component tends to produce related changes in the other components (Ruth 2001, 99-113). Marketing managers are ultimately concerned with influencing behaviour. But it is often difficult to influence behaviour directly. Let's see which appraoches can be applied in the present case.

– **Change the cognitive belief**: four basic strategies are used for altering the cognitive structure of a consumer's attitude a) change belief – shifting beliefs about the performance of the product-service on one or more attributes; b) shift importance – most consumers consider some product attributes to be more important than others. Marketers often try to convince consumers that those attributes on wich their brands are relatively strong are the most important; c) add beliefs – add new beliefs to the consumer's belief structure.

– **Change the affective component**: it is increasingly common for a firm to attempt to influence consumers' liking of its brand without directly influencing either beliefs or behaviour. Marketers use three basic approaches to directly increase affect: a) classical conditioning – a stimulus the audience likes, such as music, is consistently paired with the brand name. Over time some of the positive effects associated to the music will be transferred to the brand; b) affect towards the communication tools – liking the messages increases the tendency to like the product; c) mere exposure – while controversial, there is evidence that affect or product-service preference may also be increased by mere exposure (exposition on a large number of occasions).

– **Change the behavioural component**: behaviour, specifically purchase or use behaviour, may precede the development of cognition and affect. Changing behaviour prior to changing

[3] Attributes serve four key functions for individuals:

1. Knowledge function: some attitudes serve primarily as a means of organizing beliefs about objects or activities.
2. Value-expressive function: other attitudes are formed and serve to express an individual's central values and self-concept.
3. Utilitarian function: it is based on operant conditioning (reward or punishment).
4. Ego-defensive function: people form and use attitudes to defend their egos and self-images against threats and shortcomings (Katz 1960, 163-204). For discussion on a fifth function, social identity, see Grewal, Metha, Kardes 2000, 233-52.

affect or cognition is based primarily on operant conditioning. Thus, the key marketing task is to induce people to purchase or consume a product while ensuring that the purchase or consumption will indeed be rewarding. Coupons, free samples, point-of-purchase displays, price reductions, etc, are common techniqus for inducing trial behaviour. Since behaviour often leads to strong positive attitudes toward the consumer brand, it is possible to believe that this strategy would be effective in changing transport attitudes.

5. Communication strategies

A guideline for a persuasive strategy is outlined in order to provide possible suggestions to overcome the first barrier category (employees' social and cultural rigidity). Throughout the study three attitude categories appear to be the most significant (a number of others have been proposed in the study but they do not appear as so definite). It would be interesting to focus on these in relation to communication processes[4].

– **The status and ostentation attitude**

Automobile still carries a strong symbolic meaning especially for individuals who have a deeply developed need of *status*, ostentation and power. For this category giving up their car (or limiting its use) has a strong social shortcoming. This attitude is caracterized by low involvement to the issue which is not perceived as relevant and has not been recognized as a problem. Behavioural change appears improbable (a possibility can be thought in the long term). It is the most difficult category to capture. Positive cognitive components of communication strategies would probably have limited effect: individuals in this category will probably avoid messages that are counter to their attitude (tendency to discount them). This attitude leads to 1) an emotional and rational low involvement, 2) limited attention, focused on peripheral service-related features and on feelings; 3) low or nonconscious information processing; 4) persuasion operates through classical conditioning; lattitude toward the communication; and nonconscious belief changes lead to a behavioural and attitude change.

It appears that mere exposure to the system could possibly be a way to change attitude in this category. The system's users should however be perceived as a strong aspiration group whose ability to communicate economic and social power has not been undermined by the use of the system (possibly even enhanced). In relation to a communication process, as individuals in this attitude will probably process information in the following way: affective-behavioural-cognitive, it is advisable the use of an attractive and appealing source of communication with a use of affective and symbolic formats.

– **The freedom attitude**

This category is constituted by individuals who associates travelling by private car to *freedom*, opposed to the concepts of bounderies and constraints, typical of public and collective mobility systems. Although reality seems to disconfirm this stereotype (iadvertising and marketing tend to represent automobile in immense and isolated landscapes, but the realities of large cities is certainly different - the experience of traffic jams is quite common).

This attitude leads to 1) an emotional but low involvement, 2) limited attention, focused on peripheral service-related features and on feelings; 3) low or nonconscious information processing; 4) persuasion operates through classical conditioning; attitude toward the communication; and nonconscious belief changes lead to a behavioural and attitude change.

The freedom attitude will process information in the following way: affective-cognitive-behavioural.

The concept of freedom should be transferred to the new system that should emphasize the ability to provide customers with the freedom to do something else instead of driving (reading, chatting with colleagues, relaxing). The main factual feature of the system should be flexibility

[4] The attitudes categories which are proposed can be considered only as a supposition, qualitatevely relevant but without statistical significance.

and it must be communicated with value-expressive appeals (maybe with humour formats or social representation).

Application: design a trial behaviour project with the goal to select the most desirable elements of the services and package a highly rewarding service (operant conditioning) “trial project” of a short length of time before the real implementation. A group of aspiration could be selected at first (charismatic, innovative, creative opinion leaders) and then extend the process to everybody (two step flow communication).

– **The practical-functional attitude**

This category is constituted by individuals who allready perceive transport as a problem: iit is willing to change travel behaviour if presented with an efficient and reliable service (public and collective modes). Behavioural change is highly possible (even in the short term).

This attitude leads to 1) high rational involvement, 2) strong attention focused on central service-related features and factual information; 3) conscious thoughts about service attributes and use outcomes; 4) persuasion generally alters beliefs, which influence attitude, which influences behavioural intentions.

Individuals in this category carry out a cost-benefit analysis comparing alternatives, therefore comparative formats of information should be provided by a credible source of information. The practical-functional attitude will process information in the following way: cognitive-affective-behavioural.

In conclusion it is possible to state that solutions exist and are able to satisfy a number of needs; they need to create attention, awareness and desire to be adopted. A vertical-logical decision process is not enough to change embedded behaviours. Communication strategies should be able to communicate the idea that he/she who uses collective transport is the clever employee, the one who is the first to experiment and be innovative, the opposite to an old-fashioned and conservative person who needs to show off going to work with a new car.

The tools, added services, interfaces, communicational strategies, social network initiatives should be creative and appropriate in order to encourage the “tasting” of the services by employees and therefore stimulate a further and more permanent shift in attitude and therefore in a stable behaviour.

Directions for pursuing further research

This thesis has reflected several initial steps to help with the design of alternative modes of transport for industrial areas. The many directions in which further research can be pursued will be discussed below.

A first, and theoretically attractive, could fosus the person-based accessibility approach, which could also reveal higher accessibility benefits than utility-based measures, derived from conventional trip-based transport demand models. For example, intensive mixed land-use policy strategies increase the density and diversity of activities of the area (at present exclusively industrial and commercial) and may result in more complex accessibility and travel behaviour patterns, since individuals are then better capable of combining trip purposes and making multipurpose trips.

A second could be directed at examining the potential impacts of ICT on accessibility and mobility of an area. The accessibility approaches developed in thisi study focused on physical mobility and information and communication technology are only proposed rekated to the management of the system. To date, there is little information on how people’s use of ICT affect their individual their individual accessibility and quality of life with respect to mobility and activity patterns and accessibility (Geurs 2006, 221): ICT may for example relax spatial and temporal constriants that limit mobility and accessibility (Kwan, Weber, 2003) or maybe it could erase or decrease the need of mobility (teleworking).

A third direction for pursuit could focus on the social impacts of transport changes (ex post evaluation). In general, relatively little work seems to have been done to develop methods, tools, techniques to rigorously estimate probable social-psychological effects of transport changes. To date, social impact assessments typically focus on accessibility impacts, traffic safety, noise and

air quality, visual impacts. The works which could be taken into consideration could be the manuals on assessment methodologies for transport investments that have been recently developed in the UK (DfT, 2000) and in the US (Forcken and Weisbrod, 2001).

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Designing Innovation collecting Wishes

A method to integrate individual users into the product innovation process

Kohei Nishiyama[1], Pier Paolo Peruccio[2]

Abstract

This paper explores certain phenomena of innovation ascribable to the area of process mediators, those who facilitate and promote consumer access to products. Precisely the mediation processes, acknowledged as having strategic importance in the race toward innovation, are undergoing a trend crisis today: a weak phase that in the broad view includes design culture (Celaschi 2007, 34-38)[3].

In particular the aim of the paper is to investigate applications of the DTO (Design to Order) business model to various contexts. More important, it includes a case study of the company Elephant Design and its website *cuusoo.com*.

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[3] "A trend crisis in mediation processes" is the fitting slogan used by Celaschi to indicate the current weak phase. This crisis involves design as well as all the actors who mediate between production and consumption and regards:
- the economic-cultural system (with a shift in the economic barycentre from Western markets, in which society has slowly absorbed the economic model, to Oriental markets which have transitioned from underdevelopment to hyperdevelopment with an exponential growth of consumer processes);
- communication (experiment new communication processes suited to non-mass markets or SMEs that do not reach the traditional media),
- industrial design instruments (instruments and methods that are inadequate when designing immaterialized goods, services, experiences, anything that does not fall within the traditional way of understanding the discipline of design),
- the cultural growth and competencies of consumers, the creation of hyper-commodities;
- the separation of the global production system into two large systems: one that deals with goods and expendable materials and the other with finance, gold, oil, war. These two worlds will not be able to continue pretending they are not related to each other for much longer. (Celaschi 2007,34-36)

1. Introduction

There are essentially three indispensable actors in the design process of a product: the manufacturer, the consumer and – to bridge the two worlds – the so-called mediator of the process, who facilitates and promotes consumer access to products, working at the "mediation processes" (Celaschi 2007, 31). Acknowledged as having strategic importance in the race toward innovation, this kind of process is undergoing a trend crisis today: a weak phase that in the broad view includes design culture.

The mediator is the designer, which sometimes includes the people who work in advertising or distribution. In more general terms the role of mediation also is played by those who provide services to the design process.

This is a necessary premise for introducing Elephant Design[4], a company founded in 1997 by Kohei Nishiyama and Yosuke Masumoto to create an online network (during the dotcom boom) among companies, consumers and designers. Their purpose was clear: to put themselves in a barycentric position between the three main actors of any given design project. The means they chose is almost too obvious: the Internet and their own website cuusoo.com became a platform for these two worlds to communicate.

2. Aims

Elephant Design is Japanese user-community which since 1997 has been forming a community of users-innovators on the Internet. The result is extraordinary human capital capable of triggering sudden accelerations in the innovation processes of project culture and conceiving objects based on the specific desires of people.

Elephant Design uses the system *Design to Order* (DTO), a concept devised that same year by Nishiyama, for which a patent was registered at the end of the 1990s. In short it consists of the design of objects requested by consumers themselves (Peruccio 2008, Ogawa and Piller 2006). The methodology bridges the gap between consumers, designers and enterprises and fits nicely in the context of crowdsourcing

DTO is an innovative business model through which users express their wishes and the approximate product budget they can afford.

This methodology offers users the chance to get their desired products. Users in this case, are not only consumers, but also those who play an active role in getting what they really want. By using DTO, users innovations are self-marketed by users themselves, until an accumulated number of reservations reaches manufactures' break even point. In this way users reduce new product development risks for manufacturers by demonstrating their purchase commitments upfront. By this methodology users make reservations for product ideas while manufactures choose to invest to produce ideas which are identified as having controlled risks.

From its website *cuusoo.com* (a Japanese word that means *ideal*) Elephant Design listens to the wishes of people, which are almost always objects that have never been

[4] Elephant Design is a community formed by 2300 designer members, 530 companies, nearly all Japanese SMEs, and the users amount to over 23,000 potential buyers. The main office is in Tokyo where 14 people work, and nearly all of them are young (average age 32). They follow the system closely and provide assistance to the numerous visitors of the website.

manufactured. If after a few days – sometimes even weeks or months – the orders for that product reach a minimum threshold, production is started.

On this website users can purchase products that are already published in the catalogue. Up to this point there is nothing new. But these products are made according to the descriptions of the desires of other users. In other words they are described, requested and voted. Finally they are designed and built.

If you don't find what you want or something that satisfies you at cuusoo.com, you can go to a section on the website to describe your object in detail. Your description is examined by Elephant Design and, after conducting an economic feasibility study, it is shown with a price next to it depending on the quantities produced. At this point the orders can be made and may lead to the object being produced.

The *cuusoo index* at the website next to the products indicates the probability (by of percentage) that the object requested on the Web and then designed will actually enter production at a company in Japan, in Italy or anywhere.

Any designer can try out his/her design capabilities by entering a consumer description. The companies can also go online to gauge interest in an object and decide whether or not to produce it and in what quantities. Naturally the price may also vary depending on the demand for the product. In fact *cuusoo.com* is a virtual market.

There are many benefits to this system. Whereas in a traditional process the company sustains an investment and the entrepreneur risks capital, here the dynamic is extremely transparent. There are no leftovers in the warehouse because the products are not mass-produced but only in the quantities requested by the consumers. The consumers can choose not only items that are available on the market but request the design and production of their ideas, wishes and dreams.

Elephant Design gathers this information and forecasts the costs. Then the system finds a company interested in making it and the price is determined.

This system offers advantages to designers too. These creatives rarely ever see the materialization of their works because they often just make sketches, computer elaborations or prototypes. So in this system they naturally benefit, and not only in terms of image and glory. If the objects they produce are sold, the royalties are distributed among the partners who participated in the process.

For certain products today you have to wait a long time, sometimes even a year, before the *cuusoo index* gives the go-ahead for production[5]. One reason for this is the language of the website, which today is only in Japanese. The language barrier has prevented the market from expanding and the platform from connecting the three actors.

Elephant Design is not the only virtual design opportunity out there.

Other companies exist that have used the same principle of DTO or similar systems, e.g. “Custom Mass Production” (Elofson and Robinson 1998).

[5] Some of the more successful products are the sofa designed in 2003 by Fumie Shibata and sold by Muji: besides being quite popular with customers, it is also the most widely sold item at the Muji. Among those waiting to enter the production phase is the bear shaped TV remote control (nuigurumi-kun) designed by graphic artist Hibiki Tokiwa. An attempt was made to change the form of a remote control to make it easier to recognize at home. So here we have the proposal of a little teddy bear: if you rotate its head, it turns the TV on or off; by moving the front legs you regulate the volume and change the channel. The time component is another interesting aspect of the system. It is remarkable that The “Muji Lamp”, a wireless lamp designed by Jun Maekawa in 2002, was transformed from an idea into a product in only 18 days. Cigarro (Personal Computer for CEOs) is the computer designed in 2000 by Masamichi Katayama, manufactured and distributed by ABA-House. As soon as it appeared on the webpage, it product promptly drew the number of orders required to start production. At that time consumers were willing to pay even $4000 to have it, about twice the price of similar products on the market.

Deluxe Washing Machine is the name of a washing machine shaped like a doughnut that was first described on the Internet site, then ordered and designed in 1999 by the architecture studio Klein Dytham. It is a home appliance made of a soft plastic semitransparent material which makes it comfortable for sitting on the washing machine in the living room or the bedroom.

There is also the well-known *threadless.com*, a North American fashion company founded in 2000 by Jake Nickell and Jacob De Hart (Ogawa and Piller 2006, 66) whose DTO principle is applied to the youth fashion sector, more specifically T-shirts[6]. We would also like to mention the British company *BuilderSite* which applies the same principle to the construction sector to promote interactions between builders and users who want to renovate their homes. Then there is the company *iStockphoto* for photographs, *Ninesigma* (an immense creativity workshop for problem solving) and ZERI, a community of scientists founded by Gunter Pauli and committed all over the world to transform outputs from one factory into inputs for another factory with the goal of arriving at zero emissions (Pauli 1999, 247-249).

These phenomena can be ascribed to Crowdsourcing (a neologism formed by *crowd* and *outsourcing*) invented and outlined by Jeff Howe in 2006 in the magazine *Wired* (Howe 2006) to describe the phenomenon of externalization, mainly of creativity, by exploiting the aggregating power of the Internet to build a network of creatives, scientists, photographers, interior decorators, designers, etc.

After all, the strength of the network and its connective tissue eliminates the distance between people and companies and enables the "crowd" to become involved in the creative process. It connects an immense heterogeneous bunch of talents by means of e-mail, blogs, communities and chat rooms. This is the real innovation of the 21st century.

It is an extraordinary human resources tank you can draw from for innovation: "How Mass Collaboration Changes Everything" is the Wikinomics heading (Tapscott and Williams 2006), a metaphor for this approach to economics: new trends have demolished, among other things, the traditional concept of marketing (Kotler 1999). The digital revolution has opened the door of the global market to companies (niche companies and SMEs alike), and the Web has given them access to information. This has accelerated some market processes that no longer require huge investments in market surveys or advertising (see the crowdsourcing case).

This process of bringing companies closer to consumers allows the latter to become the producers (or "prosumers", a term coined in the 1980s by Alvin Toffler). This reflects a change in the role and activities of the "model consumer" thanks to the use of information and low-cost services and it is the basis for democratizing the innovation process as pointed out by Von Hippel.

When I say that innovation is being democratized, I mean that users of products and services – both firms and individuals consumers – are increasingly able to innovate for themselves. User-centred innovation processes offer great advantages over the manufacturer-centric innovation development systems that have been the mainstay of commerce for hundreds of years. Users that innovate can develop exactly what they want, rather than relying on manufacturers to act as their (often very imperfect) agents. Moreover, individual users do not have to develop everything they need on their own: they can benefit from innovations developed and freely shared by others. The trend toward democratizing innovation applies to information products, such as software, and physical products (Von Hippel, 2005, p.1).

Central to these processes is the Internet and its evolution (Web 2.0 or Internet 2.0) with particular focus on the content, information and relations among people and various hardware and software platforms.

Some interesting phenomena, such as *citizen journalism* or the creation of an online encyclopaedia like Wikipedia, demonstrate that there are people in the world who are willing to seriously contribute to a shared project using their own experience, know-how, talent and, last but not least, time. In the case of an encyclopaedia, the high quality standards of the product are guaranteed by responsible users (the majority) who regularly correct the information entered by

[6] Anyone can register at the website and propose their design. Once it is online the design is open for seven days to voting and the opinion of a vast community of prosumers. If it gets beyond this stringent selection, the design becomes a T-shirt, enters the production phase and generates immediate revenue for the inventor.

vandals or misinformed users, much like a living organism defeats viruses with the help of antibodies.

Citizen journalism shows that in our epoch, characterized by an excess of information, the role of some process mediators has become almost pleonastic, like that of journalists. Leaving aside the issue of the authoritativeness of newspapers, we are starting to realize the growing importance of being informed about what is happening in the world in real time. If news of a tragic event arrives while a newspaper is being written, the editorial office sends a reporter and a photographer to the scene. These professionals merely "record" what others have seen or heard or they fixate on a given image of the scene much later than the witnesses perceived and/or recorded their own images.

Eyewitness snapshots or video clips and descriptions are much more interesting and realistic. *Citizen journalism* is booming. Every day the Web, newspapers and TV programs dip into the huge well of new crowdsourced news stories.

There is a short transition from *citizen journalist* to the *citizen innovator* of Von Hippel. Who truly knows a certain product thoroughly? Not the manufacturer …and not even the designer. However, the people who use it habitually have all the information needed to improve it. This mother lode of knowledge should be shared free of charge according to the aforementioned Democracy of Innovation model (Von Hippel 2005).

The Internet has been one of the major driving behind the transition from the mass-production paradigm to the mass-customization model with its redefinition of relations between enterprises and the market. With the approach of mass-customization, companies have abandoned the MTS (Make to Stock) model to embrace a more evolved BTO (Build to Order) production model. This model inevitably entails an approach of companies relating more directly to customers. It also enables personalization and adaptation of the product to specific customer needs (Pine 1993). Customers in the system of mass-customization are at the beginning of the value chain. In other words, the enterprise will produce only what consumers actually need or desire, thus delineating the figure of the prosumer who collaborates in the production process and participates in defining what he/she wants to buy. The result is a tailored product.

With the application of the DTO system there is an additional development and mass-customization is surpassed to arrive at a model that involves the following stages: prepurchase, judgments (the voting process) with the participation of a large number of customers (the Network users). This process clearly goes beyond the traditional system of market surveys which collect and interpret customer needs (Market pull) or introduce new technology into products that are already well-established on the market (Technology push). It innovates the process in a way that goes beyond traditional marketing models, thereby generating (see the *cuusoo.com* case and the *zeri.org* case) extraordinary phenomena of innovation which is not expected from the market. Equally important is the freedom from risk for companies because the products designed on platforms such as *cuusoo.com* or *threadless.com* are wanted, designed, voted and reserved. This innovation process is also called "Collective customer commitment" and it totally absorbs the customer while sparing companies the risk of flops (Ogawa and Piller 2006).

This group of users includes all the user-innovators identified by Von Hippel as "Lead Users" (Von Hippel 1986), i.e. consumers who are particularly competent and sophisticated, with a high degree of expertise, who can develop innovative solutions for companies in full autonomy, but also users from additional user communities for group purchasing as well as more "passive" participants such as ROM (Read Only Members).

This creative approach, indebted to the neo-Lamarckian theory (which says evolution is based on environmental factors (Johnson-Laird 1993)) mainly mirrors the characteristics of a living system: all the desired products are submitted to self-selection by the users themselves and the "negative" ideas are automatically removed from the wishes system. Self-selection occurs when we accept the state of disorder implicit in the fragmentation and segmentation of skills within the community. Therefore the members of the community of online prosumers (virtual) – and this is one of the most interesting aspects from the perspective of sociological dynamics –

make a selection from which the best products emerge.

In this methodology users reserve product ideas, while manufactures choose to invest in and produce ideas which are identified as having a controlled risk.

In the DTO model users' innovations are self-marketed by the users themselves until the number of reservations accumulated reaches the manufacturers' breakeven point. In this way, users reduce new product development risks for manufacturers by demonstrating their purchase commitments upfront (Nishiyama and Ogawa 2008).

Returning to ours case of cuusoo.com, innovation comes from the description of a desire: people who work in the world of design generally neglect the consideration of "generic needs" (innate, natural needs, intrinsic to the characteristics of each individual) and focus on derived or acquired needs that emerge from the ongoing dialectics of needs created by the social environment, cultural context and technological evolution. These derived needs already represent particular technological answers given to generic needs (Lambin 2004, 66-68). The automobile is an example of a need derived from a generic need for transportation: "In the marketing vision, derived needs constitute the base from which consumers develop desires and elaborate their own imagery of the product. In other words, consumers do not dream of new forms of individual mobility but want a certain type of automobile" (Deserti 2007, 99).

Thanks to its potentially vast outreach, and non-invasive means, the DTO model intercepts the demand of generic needs (e.g. sustainable mobility projects and process innovation elements) as well as "hidden needs" which are difficult to determine by traditional market analyses. This enables the DTO model to form a real competitive advantage for the company.

While the first innovative aspect for the company is the conception (and then production) of objects that have already become successful with the public, the second innovative aspect is that the goods have been sold a priori. This weighs significantly on the "trade value" of the goods (usually a concern of economists) in addition to the designer's focus on the so-called "utility value", a term which has been enriched with new meanings over the past few years (Celaschi 2007, 25)[7].

The DTO model postulates the presale of goods in which the relations between producers and final users are changed and the figure of the process mediator evolves. These actors alternate – thanks to the flow of information – and the values in play determine a new trade system.

[7] Contemporary goods nearly always have a "function" needed to determine their "utility value" (bicycles serve to get rapidly from point A to point B). Moreover the well-known "trade value" corresponds to the higher price of money that the consumer is willing to pay in exchange for using or having or owning the good. For more on this subject, see Celasci 2007, 25.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Knowledge cartographies

Tools for the social structures of knowledge

Marco Quaggiotto[1]

Abstract

This paper aims to propose a 'cartographic' approach to the representation of knowledge in its present configurations, with the aim to visually represent not so much a disciplinary partitioning, as the interconnection of the its composing entities, the paths that develop, the thematic and transdisciplinary domains that emerge.

A cartography of knowledge spaces that takes advantage of the experience developed by maps in the representation of complex and open spaces, historically able to hold heterogenous, natural and social elements together in the same picture.

The first section of the paper is devoted to the rhetoric of cartography in its traditional meaning. In the second section of the paper a proposal for a 'knowledge atlas' is discussed.

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1. Introduction

In recent years, the methods of creation, organization and management of knowledge are changing. The causes for this global transformation of knowledge dynamics are multiple, varied, and complex in nature.

On the one hand, starting from the second post-war period, an *epistemological change* has revolutionized the way science is being done by introducing (or at least by revealing), a social dimension in the processes of knowledge construction. The individualistic models of early xx century epistemology give way to models that describe the creation of new knowledge in terms of social processes. Disciplines such as social epistemology and sociology of scientific knowledge, with some contributions from anthropology, describe a convincing scenario that connects knowledge and society, inextricably linking knowledge to the society that produces it and, conversely, proposing a model of society based on knowledge and skills.

On the other hand, *technological changes* brought by the digital revolution in the ’80s and by icts in the ’90s, have transformed channels, tools and methods for the creation, diffusion and management of knowledge. The democratization of publishing, the immediate distribution of knowledge, the emergence of alternative economies for intangible goods, the proliferation of free information and the transformation of the very concept of *author*, revolutionize the dynamics of knowledge.

Knowledge thus assumes the structure of an heterogeneous space, consisting of physical and digital resources, both textual and human, in permanent evolution. Both in the case of new digital forms (websites, blogs, databases), and in traditional formats of knowledge (libraries, books, files), authors and users interact, albeit indirectly, in the management and creation of new knowledge: they classify, link, comment, amend, edit, supplement.

Both in the contexts of scientific research and in everyday life, science and knowledge are changing shape and behavior.

- Besides centralized information collected in books and universities, a new kind of diffuse information (similar in form to once-forgotten oral knowledge), is emerging in forums, blogs and websites, or in implicit form through persons, groups, companies.
- Besides universal classifications defined aprioristically by experts, imperfect categorizations are appearing, emerging from the aggregation of the personal opinions of thousands of individuals.
- Besides rigid and permanent disciplinary structures, dynamic and fluid structures in permanent evolution, are helping describe the thematic routes cross-cutting disciplines and areas of interest.
- Knowledge is less and less manageable in terms of possession, and increasingly in terms of access to information and skills. Knowing means having access to social networks and technology able to provide necessary information and insight at the time of need.

In research focused on knowledge tools, this new cultural shift transforms needs and purposes of research. Today, the challenge is no longer that of looking for the *perfect classification,* a *permanent structure* able to divide and sort disciplines and skills into cultural sectors. On the contrary, the current urgency is trying to *‘keep together’* different kinds of knowledge resources: to gather social and cultural elements, people, research groups,

texts, designs and concepts in a single *knowledge space*. As a direct result, in the Communication Design field, the urgency concerns the creation of tools enabling the exploration, the description and the design of such spaces.

The Changing the Change Conference's main aim is to present and discuss the design research in a sustainable knowledge society. That is, its capability to generate visions, proposals and tools to re-orient the emerging knowledge society towards more socially and environmentally sustainable directions. contribution to the transition towards more socially and environmentally sustainable directions.

2. Knowledge spaces

The space metaphor, increasingly common in research relating to knowledge tools, is anything but random. Unlike the structures used over the centuries to manage knowledge by subdividing it in discrete areas, *space* is a continuous substrate: it doesn't divide culture in sections, it doesn't create hierarchies or define order in absolute terms, but on the contrary, it defines relations, proximities. Space defines groups, creates clusters, identifies pathways and highlights priorities in a dynamic structure, and likewise it allows to locate, to remember, to order.

The use of space as a metaphorical concept is not a recent invention, as it may be considered an ancestral knowledge strategy exploiting sensorial experience and spatial abilities to tackle abstract problems. Confirmation of this cognitive role of space – as reported by Lakoff and Johnson – is found in the lexicon widely used in referring to abstract domains: *"Orientational metaphors give a concept a spatial orientation; for example, happy is up. The fact that the concept HAPPY is oriented up leads to English expressions like «I'm feeling up today»"* (Lakoff e Johnson 1982, 31). The topics covered by the space metaphor are so many, that it can be said to organize, according to Lakoff and Johnson, most fundamental concepts. Unlike most other metaphors, space constitutes an analog based on direct physical experience, and not culturally mediated (Lakoff e Johnson 1982, 34).

Even when referring to knowledge itself, the analogy keeps strong: theories that differ are said to *depart*, researches can be *large* or *small*, students *follow* study *paths*, scientists are *exploring new territories*, going *beyond the frontiers* of research, sometimes even *going too far*. The metaphor of space was used in ancient and medieval times in order to remember and organize orations and texts, creating imaginary *palaces* and *gardens of memory* in which the speaker arranges columns, arches and statues to represent arguments and sections of the speech. Later, during the oration, he would then retrace his steps through the space of memory choosing the most suitable path, dwelling in depth on a subject or jumping whole shares.[2]

Even though, with the diffusion of the printed book, these mnemotechnics have lost much of their usefulness, the use of abstract spaces inhabited by non-geographical concepts and entities has never declined, and with the arrival of post-modernism their victory over has been announced. At present times, since the development of a post-modern society, abstract spaces are taking the place of geographic territories: we are therefore talking about *multiple* spaces, which arrange cultural actors of a society according to systems of values. The same elements can appear close in a semantic space and further apart in a disciplinary space, two authors may be colleagues (relational space) but interested in different topics (thematic space), etc.

In this context, the need is to find adequate practices and tools for complex and multidimensional spaces. Tools able to describe them, to make them navigable, to allow their exploration.

[2] For a thorough discussion of mnemonic devices and 'memory palaces' cf. (Illich 1994) and (Yates 2001)

3. Tools for knowledge spaces

Like any good metaphor, the spatial-territorial analogy applied to knowledge is not a mere *lexical* transfer from a '*literal domain'* to a '*figurative domain'*, on the contrary it allows to transfer *concepts, procedures* and *tools* from a known area to a still unexplored area.

As far as *knowledge spaces* is concerned, metaphors of this kind are multiple and varied: the popular concept of computer *desktop*, mixing the personal space of the desk with the work space of the office, is still dominant and despite the obvious shortcomings still seems to work pretty well. The metaphor of navigation and the spatial terminology used in the description of activities related to the use of the Internet (*website*, site *map*, IP *address*, *to visit* a site, *to follow* a link), although less imaginative than those used in the '90s (*electronic highway, cyberspace, to surf*) remain on par with more 'bookish' analogies (web *pages*, *index* of the site, *to browse*).

Even the *map*, spatial instrument par excellence, is not a recent metaphor. In addition to the famous image evoked by D'Alembert (D'Alembert 1978) in the 'Preliminary speech' to the Encyclopédie, and its appearance in the founding work of Paul Otlet (1934), one of the fathers of information science, in the last 30 years (in connection with the outburst of issues and potentials related to digital information management), we have witnessed a surge in academic research in the field of information visualization and abstract domain mapping. The approach to representation proposed by disciplines like *information visualization*, however, is mainly technical and computer-oriented, targeted mostly at the design of suitable algorithms for the display of enormous data quantities, with a perceptual-functionalist attitude toward representation. The term *'map'*, used quite often in this field's scientific literature, is therefore often a poor metaphor, applied more on an evocative and linguistic level than on a structural and cultural level.

The aim of this paper, on the contrary, is to extend the cartographic metaphor beyond visual analogy, and to expose it as a narrative model and tool to intervene in complex, heterogeneous, dynamic realities, just like those of human geography. The map, in this context, is not only a passive *representation* of reality but a *tool* for the production of meaning. The analogy, in this case, becomes not so much visual as structural and methodological in nature: it rests upon modalities, languages and tools developed by *cartographic discourse* over thousands of years to represent open spaces in constant evolution, both social and cultural at the same time.

The map is thus analyzed as a *communication device*: a mature representation artefact, aware of its own language and its own rhetoric, equipped with it its own tools, languages, techniques and supports.[3] A model that recovers the narrative abilities of pre-scientific maps and presents itself not as a mere mimetic artefact, but as a poetic and political tool: *"Make maps, not tracings.*—write Deleuze and Guattari in 'A thousand Plateaus'—*The map does not reproduce an unconscious closed on itself; it constructs it. The map is open, connectable in all its dimensions, and capable of being dismantled; it is reversible, and susceptible to constant modification. It can be torn, reversed, adapted to montages of every kind, taken in hand by an individual, a group or a social formation. It can be drawn on a wall, conceived of as a work of art, constructed as a political action or as a mediation. Contrary to a tracing, which always returns to the 'same', a map has multiple entrances."* (Deleuze e Guattari 1987)

The map as narration, is thus the expression of a communicative purpose. Just like a text, the map makes *selections* on reality, distorts events, classifies and clarifies the world in order to better tell a particular aspect of a territory, an event, a space. When used with malice, it can hide, conceal, falsify or diminish a reality through the construction of an ideological discourse, in which the communicative aims are hidden to the user. In this context, the term 'map' is a synonym of

[3] Cfr (Baule 2007b)

visual narration of space: a cultural artefact created by an *author* to describe a *space* according to an *objective*.

The map as a tool appears instead as a means that enables the user to reach an otherwise unattainable goal. It allows not only *to do* things better, more efficiently, but also to *create* new realities. As an instrument, the map expects *a user* using it to achieve an end, and similarly a *designer*, who must ensure that the structure of the instrument is as suited as possible for the achievement of the planned tasks.

In this delicate relationship, the designer's responsibility as creator of a cultural instrument becomes clear: operations of abstraction, scale choice and language work together in the narration of a virtual reality which constitutes the basis for potential action. The designer thus assumes the role of co-author of each subsequent action taking the responsibility to decide what exists, what is important. By drawing the territory, he distinguishes the significant from the secondary, the transitory from the permanent, the visible from the invisible.

In this context, the role of the communication designer is to provide methods and tools for designing images able to combine both *narrative* and *instrumental* dimensions. In a time of ever increasing power of the image (even in scientific contexts), the development of a model for the design of 'visual tools' is already a priority. A narrative for the representation of complex systems enabling not only to depict and explain, but also to act and influence the very reality that's being represented.

Beside the development of a scientific cartography, focused on neutralizing and naturalizing the cartographer's point of view, a need for a narrative approach to the depiction of geographic and abstract spaces is emerging: a *rhetoric*[4] as a technique for building visual discourses, strategic tools that enable to see and act in physical and abstract territories.

4. Cartographic rhetoric

Like any discourse, also cartography has its own *rhetoric*. Despite the negative connotations acquired by this term (often linked to operations of persuasion and concealment through linguistic stratagems), *rhetoric* is, in its original meaning, a technique for the construction of speeches.

Rhetoric, in the meaning used in this text, appears as an art in the classical sense, a linguistic technique used to *select* and *processes* elements of reality in order to transform them in an effective speech. With this in mind, the rhetoric nature of cartography shouldn't appear as a novelty: the authorial and cultural character of maps has always been one of the fundamental themes of cartographic literature and criticism, and it still is one of its major worries. The narrative component of the cartographic speech has often been regarded as a sort of unavoidable flaw, a collateral effect of an essential tool: the map. Point of view and narration manifest themselves through the operations that transform the *territory* in *image*. A rhetoric of this kind, applied both to *traditional territories* and to *knowledge spaces* can provide a meta-language, a technique conceived as *method* for the design on the map.

Just like in classical Aristotelian rhetoric, in this cartographic rhetoric it is possible to distinguish operations concerned with the selection of material (*inventio*), with the structuring and composition of speech (*dispositio*), and with language choice (*elocutio*). Obviously, the correspondence between these categories should be regarded more as a guide to the creation of a speech rather than as a deep correspondence between the operations of spoken language and those of visual discourse. In fact, while an excessive stubbornness in seeking matches at all

[4] When referring to multimodal communication models Anceschi (1993) uses the term 'registica' (direction). Nevertheless, despite the involvement of interaction elements, when speaking about the cartographic expression the term 'rhetoric' has been preferred.

levels between the symbolic-linear language of speech and the iconic-synoptic language of images could be forced and misleading, on the contrary the exploitation of the deep structure of the rhetoric discourse underlying the entire Western literature, may be particularly useful to investigate the workings of complex communicative artefacts (such as maps and diagrams) and thus to suggest a methodology for their design.[5]

4.1 Inventio

In Aristotle's *Rhetoric* the *inventio* is the first of the five operations of the rhetorical *techne*: it consists in the '*invenire quid dicas'* (i.e. *'to find what to say'*), the gathering of arguments, evidence and issues to be exposed. The *inventio* as such is not an *invention*, but rather, as Barthes noted, an operation of discovery and selection of the material.

In cartography, operations of selection, collection, classification and simplification decide what to say. They define, albeit in an abstract way, the materials of the speech to be arranged in the *dispositio* and translated into words (or images) in the *elocutio*. In the depiction of an infinitely complex reality, the cartographic narrative makes selections that decide what is relevant and what is not by creating a simplified copy of the territory, retaining only the *useful* features.

The decision of which aspects of the territory are worth showing, allows to highlight important elements of the territory, hidden correlations, significant distributions, or also deficiencies. At the same time, however, the choice is also political and moral, and it interferes in turn on the represented reality: showing something means recognizing its importance, its relevance, and its *status* as part of the territory. In this context, cartography is exposed as an intrinsically *partial* representation model, which has *incompleteness* as its strong point. It allows a narrative of open and complex spaces through the creation of multiple stories that abandon any presumption of completeness in favour of the creation of local stories, valid for limited objectives.

Within knowledge representation systems, the application of a cartographic approach, partial and selective in nature, provides a substantial change when compared to historical and recent models of knowledge representation. If, on the one hand, both linear and hierarchical representation models of knowledge are built on *a priori* categories, on the other hand cartographic representation is based on the definition of local stories, and on the rejection of a totalizing structure.

In this context, selection represents the operation deciding the extension of the research, and the elements of the story that is going to be told: people, publications, conferences, but also professionals, forums, companies, and abstract concepts can be combined in the narrative of a space as complex as the social space of knowledge, or they may be neglected and relegated to irrelevance. Maps resulting from these choices reflect, in addition to the subject of study, the epistemic context of the cartographer. *Showing*, once again, means *giving dignity* and *authority*. Drawing users, next to books, authors and Dewey codes in a library map, means to recognize the users' role in the definition of a cultural area. Drawing websites, *blogs* and forums in a map of academic research, communicates the awareness of the virtual communities' function in the processes of knowledge creation.

[5] This approach stems in many ways from research that analyzed visual rhetoric both as difference between natural and figurative language (Barthes, Bonsiepe, Group μ), and in the broader meaning previously specified (Anceschi, Arneim).
However, unlike these contributions, in this context the focus will be on the *cartographic language* as a model specific to the narrative of space, developing critical cartography research (Wood, Monmonier, Harley).

4.2 Dispositio

In the rhetoric of spoken discourse as well as in cartographic rhetoric, this first phase of speech construction (*inventio*) comes to a conclusion without any use of actual words or pictures: the materials of the *inventio* are abstract, they are *"pieces of language in a reversible state, that must be arranged in the fatally irreversible order of speech"* (Barthes 1972, author's translation).

The creation of the *'oratio'*, the *speech* (or image in our case), is carried out by two other operations: the construction of the speech (*dispositio*) and its translation into words (*elocutio*). The *dispositio* is the placement of the parts of the speech, the composition. Given a series of data elements, facts, and arguments, the *dispositio* arranges, sorts and orders the arguments in order to convince (or touch) the spectator.

The first concrete issue in the construction of the cartographic discourse lies therefore in the construction of the analogy that enables to associate every point in space with a point on the map. The map, in other words, is useful because it constitutes an *analogue* of the represented object, an *icon* that establishes a geometric or human relation between a virtual and a real space.

In case of large-scale maps the transformation of these spaces is trivial: the *projection*, this *rule* that transforms a space in another, simply 'shrinks' the two-dimensional space of the territory in the two-dimensional space of the map. On the other hand, when the analogy concerns spaces of uneven nature or dimensionality (e.g. the projection of a three-dimensional globe on a two-dimensional map), than the projection can not occur without deformation. Being impossible to avoid deformations, the projection must be carefully chosen by the cartographer on the basis of its characteristics. As in a hypothetical 'uncertainty principle' of cartography, it's impossible to simultaneously maintain a correspondence between angles, areas, distances and directions.

Cartography, once again, becomes an art of compromise and partial solutions. From a narrative point of view, however, projection operations give the designer a chance to highlight specific aspects of the territory at the expense of others. Finally, only the users' needs determine the 'better' projection.

This importance of projection operations is not limited to geographic spaces but extends also in the realm of metaphorical mapping of abstract spaces. *To project* an abstract space (e.g. a knowledge space, a social space) on paper, means to identify a transformation that matches elements of a non-geometric 'space' to elements of a two-dimensional representation. The transformation, in this case, is therefore no longer a geometric projection, but a isomorphism that *"constitutes a biunique match of points in space (and we call space also the* virtual space *of content)."*

"The assumption in this case—writes Eco—*is the acceptance of a metaphorical nature of the concept of abstract space, definable through a convention (based on mental mechanisms that make possible to imagine abstract relations in terms of spatial proximity) which stipulates that certain abstract relations are expressed by certain spatial relations."* (Eco 1975, author's translation)

Once again, the transformation between spaces is not trivial nor unique, but on the contrary it appears as an arbitrary process. The convention referenced by Eco's definition of metaphorical space may consist of an unlimited number of different rules, potentially giving shape to unlimited types of space: semantic spaces where physical proximity indicates similarity of content, relational spaces where closeness is determined by the intensity of relations between the elements, temporal spaces in which temporal closeness is translated in concrete proximity.

As with geometric projections, space-creation operations founded on abstract values imply the choice of a criterion to be used for the transformation of space. As for the rhetoric of the speech, a change in the order of the arguments does not leave the content unchanged,

but on the contrary it affects the narrative. These cartographic operations strongly define the nature of space. They show, like the more traditional projections, some characteristics of the area to the detriment of others: the choice highlights a discourse, creates an order, tells a story.

4.3 Elocutio

Elocutio, the third part of the rhetorical *techne*, deals with finding the *form* of concepts, choosing the right words, picking the right images. In semiotic terms, the *elocutio* works on the expressive functions of signs, their denotations and connotations: the aim is on the one hand to express the content of the sign, and the other hand to define a *tone* of the speech and to work on its (possible) connotations.

This third part of the *ars rhetorica* is therefore a technique concerned with words and figures, but not limited to that as, on the contrary, “it defines a field containing language altogether: it includes our grammar and what is called diction” (Barthes 1972, author's translation). In addition to ornamental functions, *elocutio* therefore appears also as an operation of moulding, of *in-formation* of the speech. The speech’s effect on the public depends both on the careful communication of meaning, and on the connotations conveyed by stylistic choice (the greater the openness of the sign, the more powerful the connotations).

In the contexts of a cartographic rhetoric, the *sign types* that can be placed on the semantic space of the map represent almost any mode of visual meaning. The signification mode of each of these signs can be purely symbolic or it can assume a more or less iconic character, reproducing the look of the depicted element. In turn these signs may refer to the denoted entities in many ways: more or less realistically, more or less abstractly, representing a single specific object (a specific lighthouse) or category of items (lighthouses in general) depending on the degree of classifications established by cartographer.

The choice of these qualities defines the overall appearance of the map, and therefore affects the user’s interpretation: the creation of a strongly ‘realistic’ map, for example, contributes to the reality effect typical of the iconic mode of signification, while a schematic and highly symbolic representation will strengthen the technical connotations.

The symbolization activities therefore act on two main levels. First of all, they determine an *order* of the image, a *value* of the represented entities. In traditional and abstract maps, larger and more visible symbols express weakly codified connotations of importance with respect to less visible signs: they become the map *theme,* expressing the author’s intentions and the representation’s point of view. Size, chromatic contrast, brightness, formal distinctions and, in general, all the visual qualities of the image define the figure’s depth, highlighting distributions, emergencies, and exceptions. In short, they define a *tone* of discourse, they raise their voice on some issues and disregard others, differentiating more or less emphatically the various arguments.

On the other hand, this definition of a *tone* together with the establishment of a cartographic lexicon (defined by the symbolic and iconic repertoire), and together with the choice of a *form* which embodies the entities, defines a *style* of communication. The *style* is therefore the result of symbolization choices, the domain of form and figure, however its function is not limited to a generic search for pleasantness. On the contrary the map *style* defines a system of connotations that carries out a meta-communicative function: it describes the communication itself by providing clues for its interpretation.

In geographical and abstract maps, language and style expose the communicative intentions of the author. However, while with regard to geographical maps, tourist maps, and technical plans, over the centuries there has been a codification of *styles* in *genres* that match form to

content according to relatively stable codes, with regard to the *new maps* this process is still being defined, and attention to the map drawing process is rather lacking.

The current look of abstract maps is in fact often an involuntary tribute to technology, exposing the automated nature of the systems that generated them. Forms and typographical elements hardly commit to a precise stance, human intervention is excluded from connotations, and the image neutrality is ensured by the *perfect naivety* of the machine. Just like in scientific cartography, the rhetoric of selection, spatialization, classification and silence is hidden by the 'neutral reality' of language. Well-camouflaged in the database structure responsible for the collected information, in data selection queries, and in layout algorithms, the *human choice* never appears in the visualization's language.

In this context, research needs to develop suitable languages for the communication of dynamic spaces and define both technical and human codes, in order to recognize the cultural role of images and of design processes.

5. Project: the Knowledge Atlas

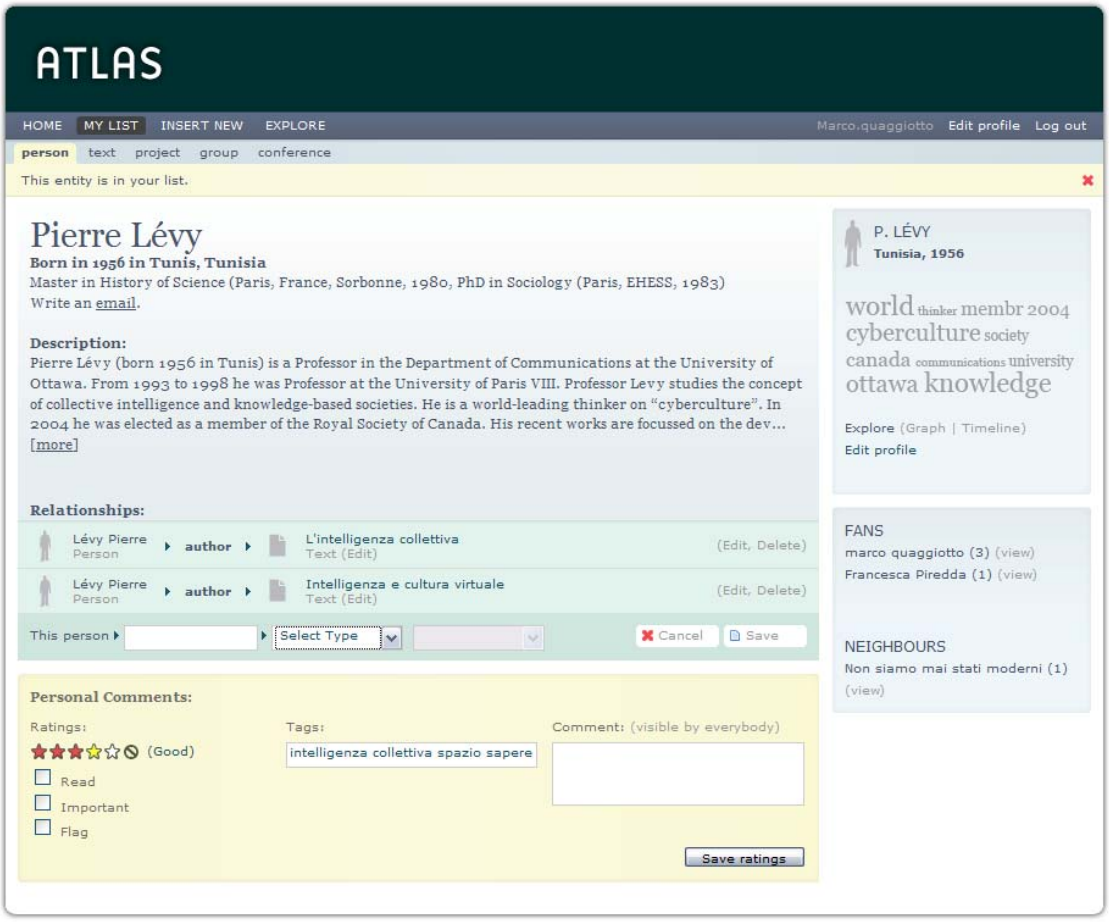
Building on these reflections concerning the use of a cartographic approach in the design of *knowledge interfaces*, during the research a software (*Atlas*) has been developed *to experimentally verify the theoretical assumptions* developed during the research, and *to explore the identified design methodologies* in order to call them into question, and retrospectively improve the theoretical and analytical framework.

From a practical point of view, '*Atlas'* is a software prototype being developed by the *Communication Design Research Unit (d.com)* at the *Politecnico di Milano*, for the management of research systems (i.e. resources, actors and relationships that interact in the creation of new knowledge), designed to support common tasks of research such as survey, mapping and analysis. The software, built on web-based technology, is a social web-application that allows users to build their own bio-bibliographic database by adding five types of resources (authors, texts, projects, conferences and research groups) related to their research. Each resource in the system can than be described *collectively* by the users (as in a wiki) in its essential features (such as date, description, location,…) and *individually,* by each user, through the definition of tags, comments, and through the establishment of relationships between entities (e.g. relating a text to its author, a person to a research group).

The aim of this management structure, expanding beyond classic bibliographic management, is to adapt to contemporary forms of cultural production: to collect non only explicit knowledge, but also implicit knowledge embodied in people, in communities and in objects. Traditional bibliographic models are therefore hybridized with a model for the mapping of social, cultural and scientific contexts.

Using this management structure for the research ecosystem, all the resources inserted in the database are shared at different levels between the users. The entities, in this context, are not limited to their individual use, but instead they represent the nodes of a big network that ties together users, resources, and keywords.

Of course, a naive visualization of *all* the entities stored within the database would be both impossible and useless because of excessive information density. As with traditional cartography, the task of representation doesn't simply lie in the creation of a *replica* of reality, but appears as a cultural process for the narration of the territory. Nevertheless, working on these data through the rhetoric methodology previously explained, it's possible to create an Atlas of knowledge spaces made of maps at various levels of scale, ranging from personal research maps to department-level maps of knowledge, or even collective maps of research areas emerging at university level. In this context, the design of the interface has a fundamental importance: its function is no longer

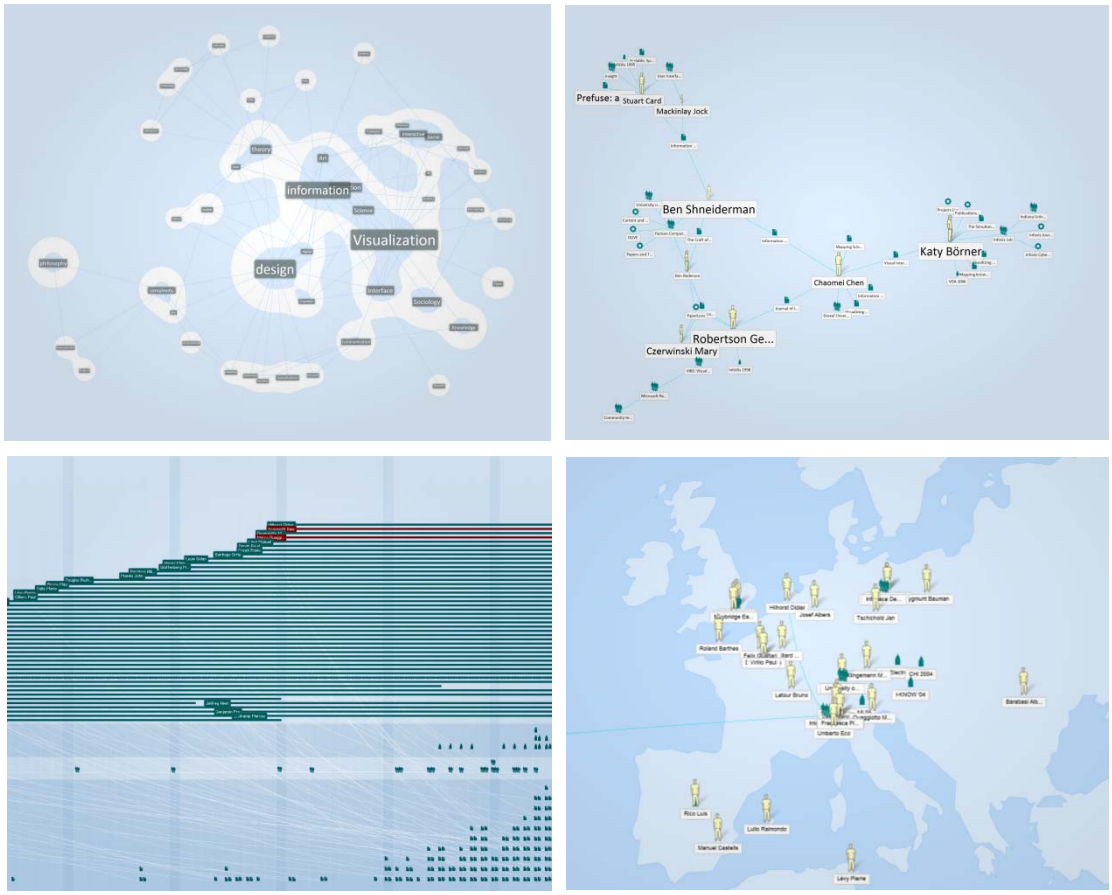


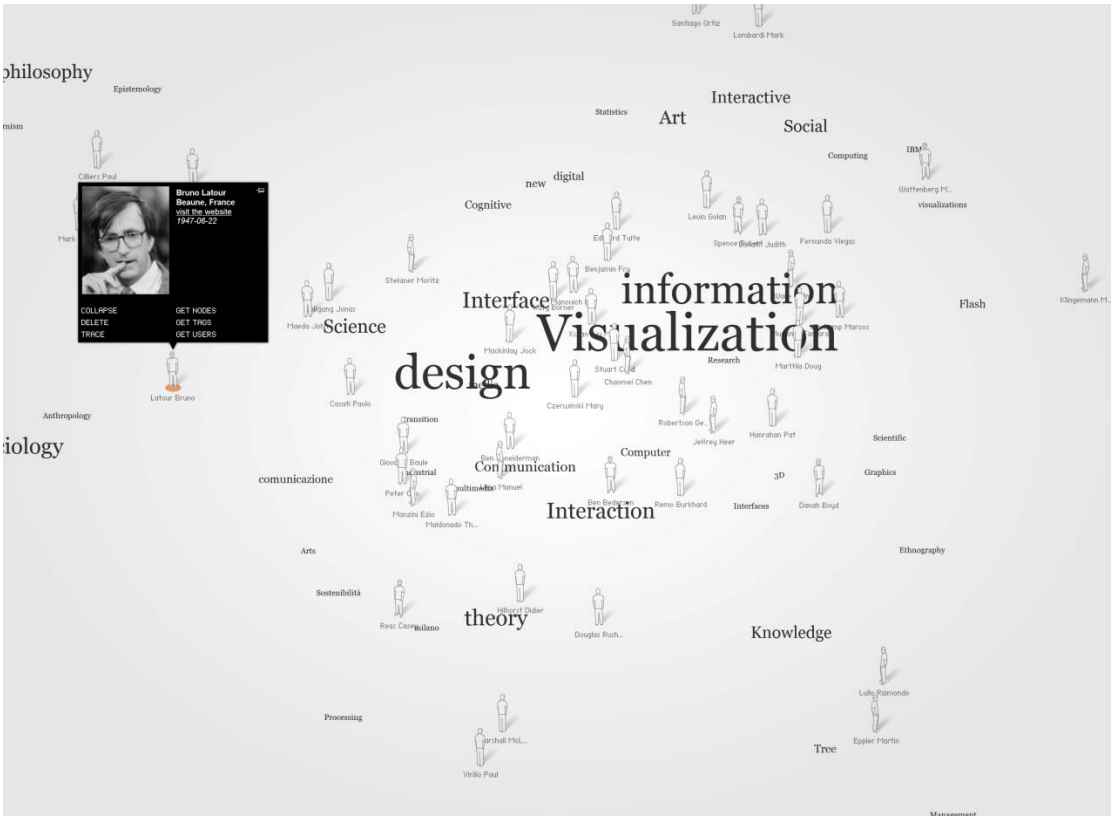
Atlas, resource page: in this page, the user can describe his resources in terms of metadata, ratings, tags, comments and through the definition of relations with other entities.

aimed exclusively at facilitating the recovery of saved entities (as in traditional bibliographic software), but on the contrary it takes on the task of representing knowledge contexts in order to allow their exploration, thus helping in their understanding.

On the basis of a cartographic metaphor, *Atlas* is an attempt at building an atlas of knowledge spaces. The concept of *'atlas'* in this context doesn't depict so much a list of maps, but rather a system for the representation of space, a *communication device* aimed at representing complex contexts through the use of many partial overlapping narrations. A tool combining multiple images with the aim to describe the many aspects creating a space.

Thanks to the design of consultation mechanisms and to the institution of a linguistic coherence, the multiplicity and heterogeneity of the images becomes an explorable system, a story on multiple levels, a mosaic made of many tiles. Just like the map itself, the atlas is a *communication tool* with its own mechanisms, materials and supports, an instrument that enables users to act on space: it allows navigation, exploration, change of scale, comparisons.





Atlas, projection: examples of semantic, relational, temporal and geographical spaces.

5.1 The Atlas

Specifically, in the case of *Atlas*, the 'atlas of knowledge spaces' consists of a series of maps, visualizations and dynamic representations created by the system starting from user-chosen parameters. If compared to the traditional Atlas format (which provides the metaphor underlying the representation system), the number of maps, their type and their arrangement is not directly defined, but they are dynamically generated in accordance to specific needs and directions.

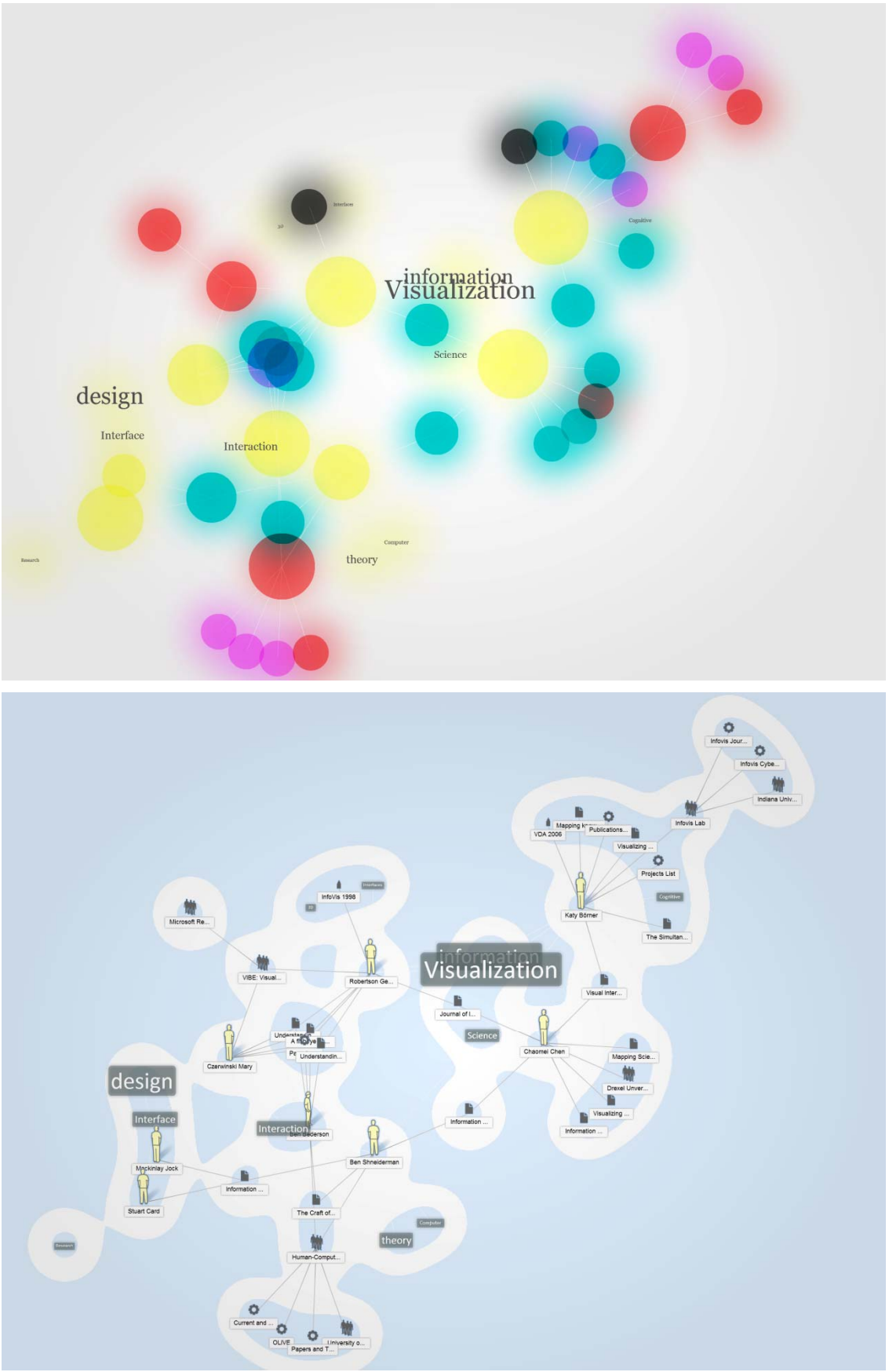
Building on a cartographic rhetoric of knowledge spaces, information and data entered by the users is selected, filtered, prepared, screened and symbolized in order to create *images* of the research. *Selections, projections,* and *symbolizations*, find in *Atlas'* interface model their practical application: the atlas becomes a machine for the production of maps, the embodiment of a theory and methodology in which the elements of a designerly approach are clearly recognizable.

Selection: The selection process distinguishes the elements relevant to the description of space according the map intended use. Depending on the author's choices, *Atlas'* maps can display every kind of resources or only selected types: just books, people, keywords, just items that have been given a certain grade, just texts of a precise historical period. Similarly, links can be shown or hidden depending on the communication strategy. Also the extensive limits of the map are potentially manageable: it is possible to create personal knowledge maps, department-level research maps, or global maps made up of all the users who show affinities between them. As in traditional cartography, the combination of these different selection patterns has great narrative power (for good or evil), enabling the user both to explain clearly and to conceal or falsify data.

Projection: The projection process, just like in traditional cartography, aims at placing the cartographic entities on the map space in order to create the best possible image for a specific activity. In the context of knowledge spaces, the *Atlas* currently provides four main projection modes, allowing the user to create maps based on *semantic*, *socio-relational*, *geographic* and *temporal* substrates.

Symbolization: Finally, the symbolization process on the one hand allows to create a visual hierarchy of resources, highlighting some of them depending on the map's intended function, and on the other hand it lets the author adjust the connotations related to the visual form through the definition of a representation language, a lexicon and a visual style. In *Atlas*, this third kind of operations allows to control aspect and form of each element of the map (including the space). Symbols and icons for the representation of each entity can be chosen, thus deciding graphic abstraction level, degree of generalization, colours, and other visual qualities. Even the space between the entities, the background constituting the *meaningful space* substrate, can be left blank or can be symbolized in order to highlight meaning or relation 'fields' such as clusters emerging in the projection operation.

The design process appears then not so mush as the process of designing an artefact, but rather as a process concerned with the design of a 'graphic machine', a *system* capable of articulating series of individual artefacts as expressions of a previously defined logic and language. This design model, which emphasizes a typical design characteristic, that of designing at a *systemic* level (Baule 2007a), proposes a formal encoding of the concept of *format* or *communication format*: a set of generative rules for the development of communication systems focused on the process rather than on the single artefact.



Atlas, *symbolization* process: Examples of different symbolizations of the same space.

5.2 A new kind of interaction

Unlike the traditional maps and atlases, *Atlas* enables users not only to get involved in the processes of space use (exploration, navigation), but also in the processes of map creation. The static structure of traditional maps is therefore replaced by maps able to change limits and scale level, maps capable of changing their appearance in order to allow deeper explorations. The user can then move in the representation space by dynamically redefining the limits of the map, zooming on areas of particular interest to gather details, or stepping away from the territory in order to obtain a more comprehensive view, heavily focused on the overall aspect of the 'landscape'. Clicking on individual elements, finally, *Atlas* gives a chance to get some details on the selected resource, and to perform operations on it: to have a look at the entity's complete file (as compiled by the community), to add any related resource or keyword to the map, to hide the selected node from the map, etc.

These operations, besides giving some tools to explore one's own research areas, give also the possibility to explore alternative paths as identified by the *Atlas* community. For example, by clicking on an author's icon in one's personal map, the user can interact with the mapping system by asking to see related entities (entered by other users). These elements, even if they haven't been entered by the user, become part of the map and can be further expanded to identify possible research directions. Just like ancient maps, this kind of map which at first is just a guide to known territories, then becomes an instrument of discovery for uncharted territories.

Another kind of interaction, which in the paper atlas is limited to the comparison of maps, in its digital counterpart allows not only to move between visualizations models at any time (allowing comparisons between geographical, semantic, relational and temporal distributions), but it also shares with the user the main operations of mapping rhetoric. The cartographer thus shares his role with the user, who becomes active participant in the creation of his own maps, designing them specifically to communicate the most interesting, or useful aspects of their research. The power of mapping, historically serving power centres (military, political, religious or economic), is then shared, if only partially, with the community.

6. Directions

In the field of interface design and research, this paper aims to make a step towards the definition of an approach for the design of cultural instruments. In this context there is a urgent need for a further exploration of *social interfaces* as means to provide instruments of interaction, exploration and knowledge in the present world. In regard to the interface model exposed in this paper, the aim is to experiment (and refine) its approach in the different spaces of knowledge, such as archives, libraries and research centers.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Towards a Sustainable Design Framework

A Study of Design Methods for Sustainable Innovation

Alex Quinto[1]

Abstract

This paper presents a *sustainable design framework*—a model that embeds sustainability criteria into the design process of material and strategic outcomes. Two criteria for developing such framework are required. First, organizations that document design processes are in a better position to articulate the value of design to stakeholders. Second, the framework calls for the use of assessment tools that measure an organization's social, economic, and environmental impact. The presented framework forms the basis for a future study that will be conducted to determine the barriers and determinants for adopting a sustainable innovation strategy inside organizations. It is informed by three case studies from the Work Worth Doing design consultancy as well as design research literature.

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Goals of this study

By doing this study, the founders of Work Worth Doing would like to strengthen the discourse around design for sustainability by proposing a framework that allows designers to accelerate the adoption of common terminology around design for sustainability and promotes the sharing of best-practices in design methodologies. A later study based on this framework will investigate the barriers and determinants iof instilling a framework that allows organizations to embed sustainability criteria into their design processes.

Introduction

Design is beginning to be understood as an activity that can address a variety of issues beyond the design of singular products. Terms such as business innovation, eco-design, social design, interdisciplinary design, among others, have become part of the terminology used by designers, business leaders and social entrepreneurs. The extent to which design methods are developed and used in practice remains to be better documented. A common viewpoint—a *sustainable design framework*—is needed.

A *sustainable design framework* would create a common platform that compares design methods being used in various types of organizations. Such *sustainable design framework* would address the social, environmental and economic dimensions of sustainability during the entire process of a given design challenge. This paper presents the methodology being used to carry a study on the use of design methods that can address sustainability. The *sustainable design framework* presented in this paper is based on the methods and experience of the Work Worth Doing design studio in Toronto, Canada. The methods presented in this paper may directly correlate to those used by other small to medium-sized design studios. It is hoped that this study will serve as a point of reference in similar organizations that are developing their own sustainable innovation strategies. Once the full study is complete, similar frameworks could be developed for other industries and types of organizations.

The research method being used for this paper is based on Dawn Chandler and Bill Torbert's definition of action research, based on first, second and third person positions. Our first person position is based on reflections of the author's experience as a founding partner and designer at Work Worth Doing. The second person position is based on a number of interviews with organizations that are documenting and applying design methods in their practices. The third person position research is based on a review of literature: how various organizations describe the work they do, as well as a review of existing design research literature (Chandler, Torbet, 2003).

This study was born out of the interest of Work Worth Doing, a design studio that applies design to social and environmental challenges, to better understand how the studio can be more effective in using design to address sustainability.

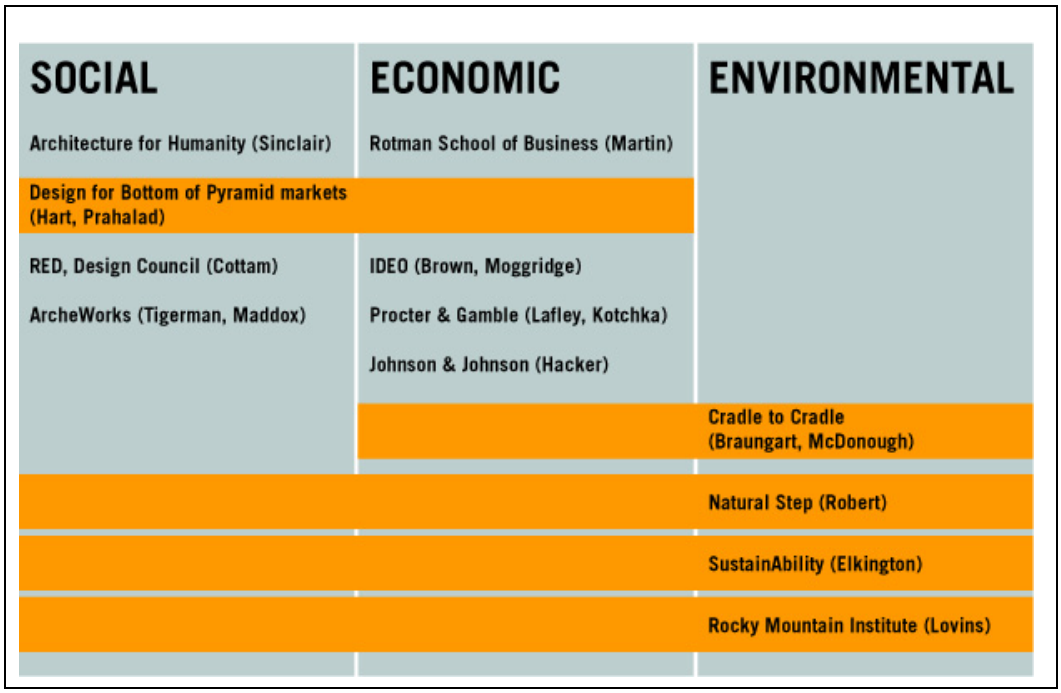
The Sustainability Challenge.

In the last half century or so, the world has gained a broader global conscience in hopes of addressing issues that threaten life on the planet. From futurists, to scientists, numerous experts have raised flags as it is more evident that human activity has detrimental effects on the environment at large. Two early wake-up calls were the books *Design for the Real World*, (Papanek, 1971) and *The Limits to Growth*, (Donella, Meadows, Randers, and Behrens, 1972).

Based on a systems dynamics simulation that factored in future uses of natural resources, the latter authors estimated the world would run out of key natural resources to sustain human life by the end of the 20th century. Although their model was far from accurate, their point about the interdependence between nations was captured in this statement: “no country, no matter how big, can solve its own internal problems before solving the problems threatening the global system.”

By 1992, world leaders started taking notice. Government representatives from 172 countries gathered at the Earth Summit in Rio de Janeiro to define a global partnership that would address the environment and development. Agenda 21, the resulting document, became a global plan for governments to begin practicing sustainable development. This document reinstated the 1987 United Nations Brundtland Commission’s definition of sustainable development as one that “meets present needs without compromising the ability of future generations to meet their own needs.” By 1994, John Elkington and his peers at SustainAbility coined the term “triple bottom line”, refering to the three dimensions of sustainability—social, economic and environmental (Elkington, 2004). This paper proposes the understanding of design for sustainability based on those three areas of sustainability. See Figure 1 for an example of organizations using design along the lines of the triple bottom line.

Fig. 1. Examples of design-driven organizations and their advocates, seen through the triple bottom line perspective.



Anticipatory and interdisciplinary design methods can address sustainability

Studying the process of designing has become the interest of the design research community. While some design processes and tools remain in the domain of trained designers, a basic definition of design, understood as a plan to achieve a desired outcome, is broadly used by many professions. Design methods are used knowingly, or not, by a wide range of professionals. This is confirmed by various authors (Brown, 2005; Buchanan, 1995; Simon, 1996). Design used in this paper is referred to as a *verb*, rather than a *noun*, a process, rather than a tangible outcome (Boland, 2008).

It is now a well-known fact that humanity's current patterns of production and consumption are contributing factors to global warming and climate change. The challenges brought about by climate change are complex and need to be tackled from a systems perspective since environmental conditions such as water shortages, greenhouse gas emissions and energy-intensive industrial process are interrelated. Furthermore, social factors brought about by poverty, government corruption, aging populations and fluctuating migration patterns, require interdisciplinary and anticipatory approaches if design is to make a contribution to these issues. This study focuses on those two aspects of design: the ability of design to synthesize solutions out of an interdisciplinary process and the anticipatory aspects of the design process. Some examples of those skills will be illustrated later through case studies.

The anticipatory qualities of the design process, or the ability of designers to portray more desirable states of being, is an important skill of design thinking that is well-suited to address sustainability dilemmas. Design provides a different type of value from other activities such as science or management. In contrast with science's concerns with understanding how things are, design is concerned with how things could be.

The benefits of such anticipatory thinking could result in the design of material and immaterial outcomes. The design of sustainability strategies, for example, could prove to be better solutions than technical fixes. "A change in worldview, intention and lifestyle, facilitated by dialogue and education, may be a far more effective way of problem-solving than the creation of more artifacts and technical fixes." (Christian Wahl, Baxter, 2008). Similarly, the World Wildlife Fund (WWF) supports the need to re-think existing approaches to socio-technical solutions. In its Climate Solutions: WWF's Vision for 2050 report, the WWF mentions that "it is technically possible to prevent irreparable damage to the world's biosphere, economy and society if significant action is taken today using existing technologies and simply scaling up what we already know how to do." What is needed from designers is new articulations of compelling systems that take advantage of existing technologies.

In order to better address climate change, for example, policy-makers could use the advice from designers to inform their decision-making process. It is commonplace for governments to receive advice from the scientific community on the need to stop greenhouse gas emissions—what not to do. Designers could provide "what to do" advices, complimenting wisdom with vision (Owen, 2005).

Leading design firms are well equipped to address interdisciplinary and anticipatory issues. It is commonplace for design departments in medium-to-large companies to be staffed with professionals from diverse backgrounds such as psychology, anthropology, ergonomics, management and economics. Interdisciplinary design tools such as charrettes, dialogue processes, anthropological studies, ergonomic studies are common practice among designers. Designers are well skilled in anticipatory design tools, such as visualization and prototyping of material and "immaterial" outcomes. The design of products, strategies and experiences in design firms using these types of tools are commonplace. However, an increasing demand for sustainable innovation strategies would require design groups to address sustainability criteria (a practice that is just emerging).

A common viewpoint is needed

Understanding design inside an organization.

One key criteria that is required to better design for sustainability, is the need to document design processes that can be improved upon. Some companies are accustomed to documenting their own design methods.

The British Design Council, in their study of eleven global companies, mention the use of 'methods banks' to improve the performance of design teams inside companies (Design Council, 2007). "The capture and re-use of best practice design methods in 'banks' or programmes are considered to encourage best practice in design, avoid re-work and improve robustness and efficiency of outputs." The report also mentions the value of documenting design methods when assessing the contribution of design in a company's products or services: "Documenting [design methods] in a formal tool shows the designer and the company that their work is valuable, appreciated and has tangible outputs. Design methods help to define the project that will prove a product or service's business potential and bring it through development and implementation phases. Having a resource that advises on this helps process planning and management."

Documenting methods can help an organization identify typologies of design processes. Such typologies could indicate which methods are successful in reaching specific goals, whether they are financial, social, or environmental. Documentation can also pinpoint methods that need to be re-designed, or invented.

Articulating a shared framework in an organization.

Between 2003 and 2006, the Centre for Sustainable Design at the Surrey Institute of Art & Design hosted a number of conferences under the theme 'Sustainable Innovation'. The conferences reached a number of conclusions, including the need to:

- Articulate a common design framework that deals with sustainability. Although "there are a range of eco-design and Sustainable Product Design & Development (SPDD) tools and methodologies starting to emerge, there is no common viewpoint."

- Promote more systems-based thinking skills. “SPDD is different from eco-design, in that it takes account of social and ethical considerations alongside more traditional environmental and financial aspects.”
- Define a framework that recognizes the designer within a broader team of participants, and recognize the issues beyond the control of a team working in sustainable innovation.
- Understand the limits of a designers’ skills/contributions and acknowledge what others might bring to the table.
- “Make better connections between stakeholders in the development of Sustainable Innovation Systems (SIS), e.g. investors, inventors, entrepreneurs, academia, etc.”

The *Sustainable Design Framework* presented in this paper is based on Martin Charter’s definition of sustainable innovation understood as “a process where sustainability considerations (environmental, social, financial) are integrated into company systems from idea generation through to research and development (R&D) and commercialization. This applies to products, services and technologies, as well as new business and organization models” (Charter, Clark, 2007).

The proposed framework

The *Sustainable Design Framework* is a model that embeds sustainability criteria into the design processes of an organization. The framework calls for establishing a common vocabulary among designers and other professionals on the implications and potential benefits of having design capabilities within an organization, as they can contribute to an organization’s sustainable innovation strategy. It is based on systems thinking in the context of designing social, economic and environmental outcomes. Having a *sustainable design framework* in place can educate stakeholders in an organization on the required steps needed to address sustainability. It is informed by J.P. Guilford’s models on creativity (Guilford, 1967) and other design processes used by other organizations.

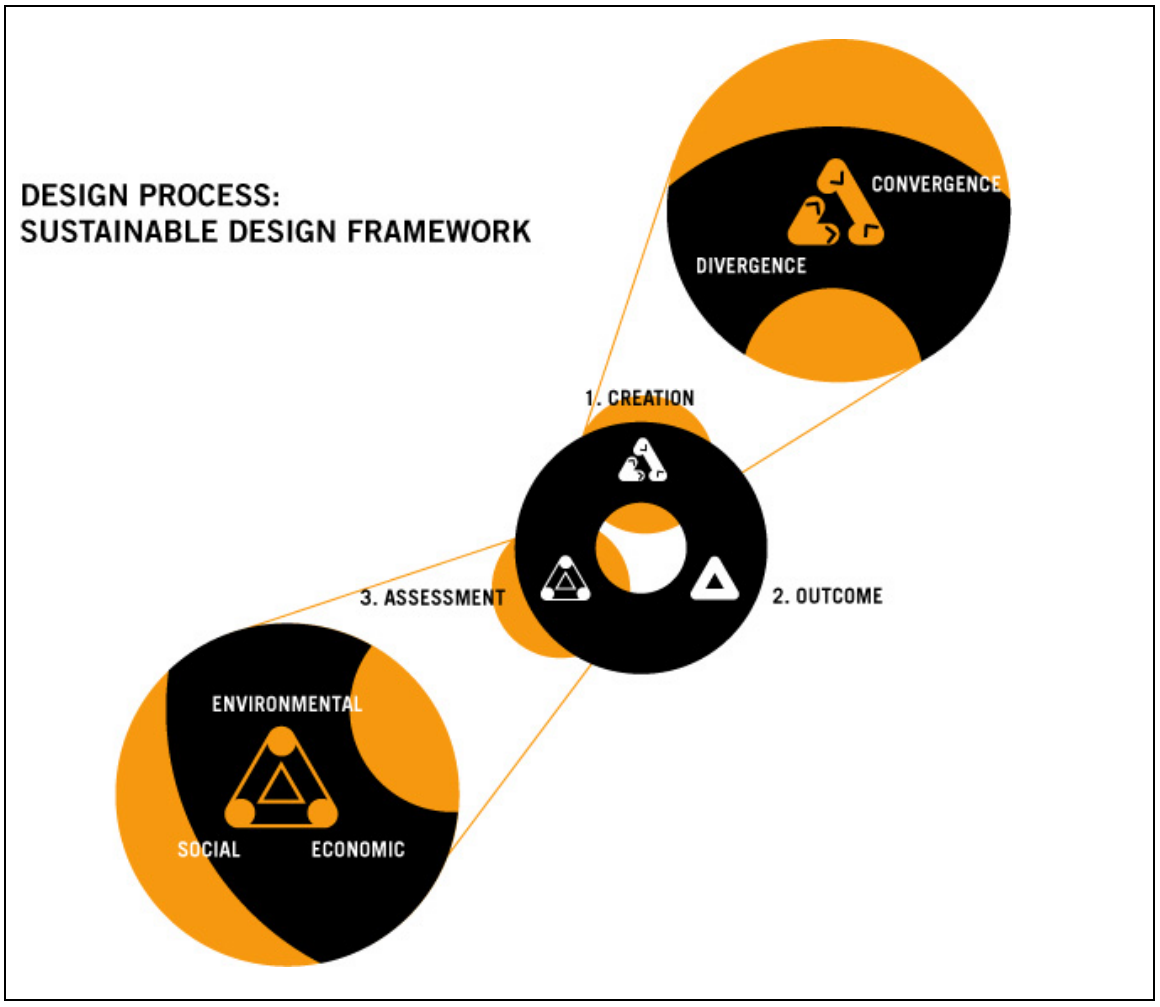
Similar frameworks exist that address sustainability during the entire life-cycle of development, such as Cradle to Cradle and the Natural Step. Cradle to Cradle embeds the Hannover principles of waste reduction, longevity, natural energy flows, among others, which perform particularly well on the environmental and economic dimensions of sustainability. On the other hand, the Natural Step can be applied to social, economic and environmental dimensions of design processes. It is based on scientifically-proven methods that can move communities, companies and organizations towards a sustainable path. A more diverse pool of similar frameworks informed by the experiences of organizations are needed to enrich discourse around design for sustainability.

The *Sustainable Design Framework* presented in this paper promotes:

- a documentation of design processes that advocates for:
    - a shared language and understanding among stakeholders inside an organization as all participants move towards sustainability.
    - an understanding of design's contributions to an organization's sustainable innovation strategy
- the use of assessment tools that:
    - assess an organization's social, economic and environmental impact
    - benchmark an organization's progress on developing sustainable practices.

The *sustainable design framework* is composed of a creation phase and an assessment phase (see figure 2).

Fig. 2. Design process of the *Sustainable Design Framework*.



Creation.

The creation phase is composed of two sub-phases: an exploration period (divergence), followed by a period of decision-making (convergence) that generates outcomes in the form of material and strategic solutions.

In the divergence period, designers often use tools and methods that allow them to ideate possibilities, prototype solutions and gather insights. Some examples of tools used in the divergence sub-phase are listed in figure 3. Although many of the tools and methods mentioned are generic, some specialized tools are becoming more widely used. Social interaction methods such as Open Space, World Café, Appreciative Inquiry and Engagement Continuum, are examples of specialized methods used when designing for social groups.

Fig. 3. Design Tools and Methods used in the creation phase.

Ideation processes - brainstorming - hypothesis-forming - theory-forming - scenario planning
Prototyping - model building - storyboarding - sketching - mapping - visualization
Insights gathering - anthropological studies - ethnographic studies - ergonomic studies - surveys/interviews on stakeholders - research - data analysis - testing - trend forecasting
Social interaction - dialogue processes - workshops/charrettes - strategic conversations

Designers usually play an important role in the divergence period, while managers are more likely to play the convergent role. Richard J. Boland, quoting Herbert Simon, mentions the three factors in decision-making processes: design, intelligence and choice. Boland highlights the different management styles that result in different combinations of these factors. The framework presented in this paper is similar to the management style that Boland describes as a process that begins with Design, applies

Intelligence and ends in Choice. Design shapes things and is followed by a sensemaking process. Boland explains that “during sensemaking, intelligence is applied to order [elements] in ways that make the situation meaningful, aesthetically pleasing, and morally acceptable. This intelligence is followed by a choice of which meanings and sensemaking structures to carry forward into future enactments” (Boland, 2004). This decision-making process is referred to as a convergence period in the *sustainable design framework*.

Many companies that emphasize design have iterative design processes in place that promote creative thinking, while companies that emphasize management over design, may be driven by previously-tested strategies for reducing costs and lowering risks. In the creation phase of the *sustainable design framework*, design and management teams could create a shared vocabulary, as suggested by Boland, that promotes a mutual understanding of design and management processes and articulates a shared process of creative exploration and decision-making. When faced with the need to implement an environmental strategy, managers managers might turn to the ISO 14000 protocol to gradually reduce waste and energy use in a company, therefore reducing costs and increasing productivity. Designers, on the other hand, would take a different approach. Rather than gradually lessening the environmental harm, they might prototype new services that have no impact on the environment.

Documenting design methods can educate designers and managers on the need for a shared design and management process. This documentation can provide supporting evidence that an organization’s process is in need of disruptive innovation, a need that designers could meet. It can also highlight processes that only need linear improvements. Numerous classes of processes used in an organization could emerge as a result of such documentation. The methods bank inside an organization could catalog methods that could range from the repeatable to the disruptive. When addressing sustainability, companies are challenged to develop new areas of expertise. Having an on-going documentation process helps organizations understand the role of design in unfamiliar territories. When designing for communities, for example, designers might play the role of ‘facilitators’, co-designing with a diverse group of stakeholders (Manzini, 2004), an atypical role for designers who are used to being the sole authors of their designs.

Assessment.

The triple bottom line can serve as the basis for assessing the impact of design on sustainability issues. Measuring the impact of organizations on the social fabric of communities, their economic development and natural habitats, are crucial tactics that designers are just beginning to understand. The role of assessment tools, metrics, and certifications are particularly important in informing the design of sustainable solutions.

Many assessment tools, metrics, and certifications are already in place (see figure 4). Having assessment metrics informs the design process in the creation phase of the *sustainable design framework*. Metrics provide evidence of the state of an organization’s sustainable innovation strategy, signaling the need for design thinking when progress is not being made.

Fig. 4. Examples of existing assessment tools and certifications.

Social	Economic	Environmental
Social Footprint Index, Global Compact, The Natural Step, Corporate Social Responsibility (CSR) policy, Universal Design principles.	Global Compact, The Natural Step, Integrative Thinking Process, Six Sigma, TRIZ, cost-benefit analysis, ISO 9000.	Cradle to Cradle, ISO14000, Life-cycle assessments/ eco-indicators, LEED, BREAM, Green Globe certification, The Natural Step, Environmental Management Systems (EMS).

A later phase of this study will necessarily have to learn what impact assessment methods have on an organization's design processes. It will also be necessary to better understand the positive feedback loops that take place in the triple bottom line. A company that has an Environmental Management System in place, for example, reduces operating costs, thus increasing productivity and profit inside a company—an example of how the environmental bottom line has a positive effect on the economic bottom line. Similarly, companies provide social services simply by employing personnel, thus keeping unemployment and inflation rates down in the local community where they operate—a positive social effect resulting from the economic bottom line.

The Work Worth Doing experience

Work Worth Doing (WWD) is an interdisciplinary design studio employing anywhere between two and five designers at any given time. It was created in 2004 for the purpose of applying design to social and environmental challenges. WWD believes there is a business case for creating projects that benefit the environment, communities, and organizations. Because the studio's mission is to create positive social and environmental change, it has a need to measure the impact of its projects.

The studio takes on client-based projects and also generates its own projects. Initiating its own projects allows the studio the flexibility to experiment with various methods, development processes, interventions, timelines, and potential solutions.

Client-based projects tend to be more outcome-driven, and the end-results are determined by clients from the beginning of a project. Examples of these client requirements are: research and innovation documents, exhibitions, and publications.

The studio's approach to design and sustainability.

Based on a review of WWD's previous projects, the author identified two themes that capture the studio's approach to sustainability: Knowledge and Action. Knowledge projects create or promote knowledge about sustainability, while Action projects implement sustainability practices through measurable results. Initial projects that the studio embarked on dealt with educational products, tools, and experiences. Two case studies of Knowledge projects are included in this paper (see Case Studies I and II). This paper is also an example of an Action project, as it promotes ideas, and knowledge around sustainability issues.

Case Studies I and II
Knowledge: Tools to Think With

Case Study I
Greenland: Too Perfect. What if Greenland was Africa's Water Fountain?
This exhibition project was developed in collaboration with Bruce Mau Design and commissioned by the Danish Architecture Center to demonstrate how designers could operate in 'new areas'. Through design thinking, a system was developed that promotes capturing glacial meltwater in order to prevent the disruption of ocean currents in the Atlantic. Taking advantage of the captured melt-water, the proposed design includes a water-shipping system composed of massive ocean-going water bags that transport Greenland's pure melt-water to water-stressed regions of Western Africa. To finance such a system, the design includes a program for bottling Greenland's iceberg water and exporting it to affluent markets, thus diversifying Greenland's economy. The project also identifies a variety of partnerships between Greenland's government, African communities, and water companies. This project is an example of how designers could articulate disruptive innovations, in this instance, for Greenland's government.

Case Study II
Hyperborder: The Contemporary U.S.-Mexico Border and Its Future.
This publication project was developed in collaboration with Fernando Romero and his LAR architecture studio in Mexico City. This research-based book project had two parts. The first part contextualizes the current challenges found in the U.S.-Mexico border region with other examples of collaboration and conflict found in other international boundaries. It is complimented by an extensive mapping, and visual analysis of Mexican and U.S. political systems and economies as well as infrastructures. The second part of the book presents future scenarios—both positive and negative—that both countries are likely to face in coming decades. The scenarios are designed from the perspective of complex issues such as security, narcotraffic and corruption, economic development, health, aging and migration, among others. Such comprehensive presentation is a useful tool for decision-makers in both countries as well as educating broad audiences in both countries on the need for a systems approach to designing binational solutions.

The projects presented in Case Studies I and II can also be considered as “tools to think with”. They engage broad audiences and clients around issues related to global warming and water shortages as in the case of Greenland: Too Perfect, or around complex social, political and environmental issues between Mexico and the U.S. as in the case of the Hyperborder project. They both make use of anticipatory skills since they present potential solutions or future paths of action, rather than technical fixes to solutions. They were also developed using interdisciplinary approaches. A team of young professionals with backgrounds in sociology, anthropology and international relations was assembled to develop the Hyperborder project. Similarly, the Greenland project was informed by a diverse pool of experts. Both case studies were presented to decision-makers in government (Greenland, and Mexico) for consideration. The use of design for political decision-making processes is an area that the studio would like to continue exploring.

Since the studio’s founding, WWD has been developing a project called Now House which the studio considers its first Action project, since it embeds sustainability criteria into the project’s social and environmental outputs (See Case Study III). It also makes use of anticipatory and interdisciplinary design approaches.

Case Study III

Now House™: One Small House, One Million Opportunities.

Now house will turn a 60-year-old WWII house into a near zero energy house—one that produces almost as much energy as it uses. Now House is one of twelve winning teams from across Canada in a competition organized by the Canadian Mortgage and Housing Corporation (CMHC) that called for housing designs that are healthy, affordable, sustainable and energy-efficient. The Now House retrofit design will reduce greenhouse gas emissions by 5.4 tonnes annually. Solar photovoltaic and solar thermal panels will reduce the homeowner’s energy bills to zero on an annual basis. The demonstration house, located in Toronto, will be open for tours once it is completed in the summer of 2008. WWD has also started a community project inspired by the Now House project. Work Worth Doing is working with a community of 200 wartime house owners on a community-driven project that promotes energy-saving campaigns in the community with the goal of reducing energy use by 25% against a benchmark. With one million similar wartime houses across Canada, the team is starting with one house, then a community of wartime houses, then a million houses across the country.

The Case Study III project, unlike the Knowledge projects, introduced the use of metrics to measure the project’s impact on the environment. The studio is currently applying the knowledge acquired from retrofiting a house to near-zero energy into a community project. The studio wants to use similar metrics to measure its environmental, as well as social impacts in this community as the studio shares its knowledge and experiences with that community. A key factor that required the studio to begin using metrics around sustainability was a requirement by the competition organizer (CMHC) to ensure the Now House project met the competition entry criteria. Competition parameters required the team to conduct an integrated design charrette and use energy modelling tools to predict measurable results.

The charrette was attended by engineers, architects, product manufacturers, students, urban planners, graphic designers, and economists. They had to work together to design the retrofit in such a way that it would reach net-zero energy on an annual basis. Through a modeling exercise, the team was able to simulate the amount of annual energy reductions, meaured in Joules, and greenhouse gas emissions reductions (measured in CO_2 emissions) that would be achieved with the proposed house retrofit design.

The studio's Knowledge projects (case studies I and II) are similar to the work of universities and non-profit organizations that promote knowledge and new ideas. An Action project, like the Now House, is comparable to the work done by private-sector companies and non-profit groups. This evolution in the studio's practice from Knowledge into Action is consistent with a review of how other organizations use design for sustainability, by talking about sustainability, and implementing sustainable practices.

The fact that the studio has Knowledge and Action projects, which are comparable to the work done by universities, companies, and non-profit organizations is in line with the vision of the founders of the studio. In 2004, the founders stated that WWD would be a mix of an innovative enterprise, a philanthropic NGO, a research lab, a cultural institution, a think-tank, a production house, and an entertainment company. The studio is in itself an evolving organizational design that is learning how to best use design to create positive social and environmental change. Figure 5 contextualizes the studio's methods in the creation and assessment phases of the *sustainable design framework.* This framework will inform how the studio approaches future projects.

Fig. 5. A *Sustainable Design Framework* applied to WWD projects.

Project	Methods used in the Creation Process	Design Outcome	Results Assessment
Greenland: Too Perfect	Prototyping, Mapping, Visualization, Interviews with stakeholders, Research, Data analysis, scenario planning, hypothesis-forming	Exhibition	Social and environmental criteria were used when designing, but no measurable criteria can be assessed.
Hyperborder	Prototyping, Mapping, Visualization, Workshops, Interviews with stakeholders, Research, Data analysis, scenario planning, Trend forecasting	Publication	Social and environmental criteria were used when designing, but no measurable criteria can be assessed.
Now House	Dialogue processes, Workshops, Charrettes, Model building, Theory-forming, Scenario planning, Surveys and interviews with stakeholders, Data analysis	Housing retrofit, Community project, Business model	Environmental metrics: Greenhouse gas emissions, Energy use reduction and energy production measured in Joules. Social metrics (qualitative and quantitative): Number of new community social networks will be counted; Interviews in the community will measure positive impact as a result of the intervention.

Going forward

The *sustainable design framework* mentioned in this paper forms the basis of a methodology to be followed in a later part of this study. WWD will conduct interviews in organizations that have design policies in place and that are in the process of developing a sustainable innovation strategy. This second phase will study study the barriers and determinants in adopting a *sustainable design framework* inside organizations.

Numerous challenges in attempting to implement a *sustainable design framework* in an organization can be identified already, including some of the following:

- Allowing time for design groups to catalogue their design processes is not a common practice and is often considered as non-essential to the financial goals of companies. Companies that use repeatable design methods for 'repeat' client work often have implicit methods that are developed through experience and are not formally articulated.
- Establishing a common vocabulary that describes the methods used both for creation and assessment phases of development is a challenge, as management and design groups are trained using different terminologies. There is a need to promote generalist and specialist approaches of design. The need for interdisciplinary and anticipatory approaches in design can be traced back to Buckminster Fuller, who in 1964 called upon designers to be comprehensive and adaptive professionals (Fuller, 1964). However, many companies and organizations only hire specialist designers. Staffing organizations with designers with knowledge of management, and managers with knowledge in design should be promoted.
- The study of design methods used in different industries will require the acknowledgement of specialized terminology. Some methods used in one industry may not apply to other industries. Specialized *sustainable design frameworks* that acknowledge an industry's terminology might be necessary.
- Encouraging private-sector design groups to share their design methods with the design community at large remains a challenge, since it can compromise the competitiveness of some companies. Cradle to Cradle and The Natural Step serve as points of reference to instigate this question. The former has both for-profit and non-profit organizational models (McDonough Braungart Design Chemistry, LLC and GreenBlue), while the latter is solely a non-profit organization.
- Establishing a shared understanding of the design processes among diverse stakeholders in different sectors, such as government, communities, and organizations would require increased promotion of design's value. Design organizations might play a valuable role in this regard.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design for all

A co-design experience in rural India for healthy indoor cooking

Simona Rocchi[1] and Yasushi Kusume[2]

Abstract

For many women in rural India spending several hours a day cooking over an indoor open stove is the norm. What these women fail to realize is that there is a dangerous killer in their kitchen: burning biomass fuels causes almost 500,000 deaths every year in India alone.

What can creative design do to help these women continue with their traditional culture, while empowering them to select a way of cooking that does not endanger their lives?

This paper illustrates an initiative built up within Philips' global design community, where employees used their capabilities to face important current social and environmental issues and, in the paradigm of open-innovation, to provide a concrete context-specific humanitarian answer to one such issue.

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1. Background

We are currently living in an increasingly complex, inter-connected and fragile world characterized by population growth, globalization, political instability, social and economic inequality, and environmental degradation. These trends are transforming our society and our economy: sustainable development is no longer an option, it is imperative. Companies with long-term economic ambitions must find new ways to continue being competitive in the saturated markets of advanced economies, but they also need to learn how to flourish in emerging and developing markets that represent a growth opportunity for the coming years (Prahalad 2005: 3-21).

In order to address the 'un-met' needs of low-income people in emerging and developing economies, creative thinking, system views and open innovation seem essential nowadays. Standard process and product related eco-efficient practices cannot, on their own, provide competitive and valuable answers (Hart 2005, 85-104). The challenge is to create accessible and affordable solutions that match local infrastructural and economic conditions and socio-cultural preferences, without expanding the current use of environmental resources. To face this challenge, new and appropriate business and design practices are necessary to define effective and sustainable growth trajectories.

Within this search, a promising path is emerging: a mutual value creation process between companies and local stakeholders who have a deep understanding of specific contexts, issues, and opportunities; an 'intensive listening' to the 'voice' of potential target communities, families, and individuals (Simanis, Hart, Enk, et al. 2005, 5-13). Pioneering activities of this type are initiated in various ways. Companies that aim to become truly sustainable, and develop propositions for 'underserved' people, often use social investment budgets while on their journey of learning.

The tendency is to replace traditional cash donations - to organizations that deliver a variety of social and environmental benefits - with activities connected to internal competencies and with specific actions carried out by employees. The conviction is that humanitarian projects, conducted with a business-like approach, can generate both value to society and competitive assets (Porter and Kramer 2002, 1-14). They can support socio-economic and environmental causes, but they can also serve as laboratories to develop new, sustainable solutions, new insights into resolving societal problems, and new ways of working.

2. Introduction

It is against this background that this paper intends to illustrate how to leverage design and research capabilities to create a common vision of sustainable development, and to translate this vision into context-specific humanitarian solutions. To do so, it draws on the experience built up within Philips Design[3], one in which employees worked together in a large-scale design workshop, and on a local follow-up activity.

Using this experience, the paper aims to:

[3] Philips Design is the design service unit of Royal Philips Electronics. It covers 11 locations around the world, with a total of 550 professionals from more than 30 nationalities. Its creative force embraces disciplines as diverse as product, interaction and web design, sociology, anthropology and socio-cultural trends research.

- provide an overview of the design process and tools used to inform, inspire and engage the creative 'sustainability' thinking of 275 designers and researchers challenged to confront global sustainable development issues, and a variety of 'quality of life' topics affecting people on very low incomes;

- describe the open innovation approach adopted for the implementation - in rural and semi-urban India - of one of the design concepts generated during the creative phase: the 'Chulha', a stove for healthy indoor cooking co-developed with various local stakeholders and end-users. The stove is designed to combat sickness and death due to indoor air pollution from cooking with biomass fuels, but also to stimulate the formation of local groups of entrepreneurs to produce and distribute it.

The paper starts with a summary of the initial design workshop, defined in terms of scope, structure, participants and type of research input. It continues with a description of the methods used to gather information, generate users' insights, and consolidate knowledge. It then illustrates the design tools and criteria used to generate ideas.

Along the way, it moves from concept-design to concept-development and piloting by describing: the approach used and the stakeholders involved in carrying out the project in India; the current project status; achievements/obstacles; next steps, including scaling-up activities.

It concludes with a few reflections on the learning from the project, and on a few thoughts regarding the specific contribution of design towards sustainable development.

3. Raising awareness, stimulating creative thinking

In September 2005, the Philips Design global community came together in Eindhoven for a one-and-a-half day workshop entitled 'A Sustainable Design Vision - Design for Sense & Simplicity', in an attempt to rethink charitable donations beyond financial sponsorship. The workshop, which followed the Philips' themes of social investments (Philips 2005) – access to healthcare, wellness and education – aimed to explore directions and opportunities for innovative humanitarian propositions that would express our company's mission[4], and would consider:

- internal competencies, technology and know-how, combined with external, complementary expertise;

- people's needs and aspirations manifested in various regions of the world, and more specifically, in their contexts-of-life.

The aim was to come up with products and services able to support Non-Governmental Organizations (NGOs) in relieving the suffering of people in emergencies (resulting from natural disasters), or enhancing individual empowerment and the socio-economic development of local communities at very low income level.

In preparation for the workshop, a core project team, comprising design innovation, environmental science, user's research and socio-cultural trends capabilities from headquarters and a few regional branches, was assembled to conduct six months of extensive research and organizational activities. To create enthusiasm within the Philips Design community for the coming event, three packages of material designed to promote communication were distributed several months in advance. The material introduced the setting, aim and ambitions of the event and provided examples of innovative companies' humanitarian actions to tackle environmental and social challenges. Such challenges were brought to life at the opening of the workshop

[4] Philips' mission states: "*Improve the quality of people's lives through the timely introduction of meaningful innovations* ".

through speeches given by representatives of three international Non-Governmental Organizations (NGOs): Médecins Sans Frontières, Save the Children and Light Up the World[5]. They described the problems encountered in their work, using touching, real life stories.

During the event, the 'Design Times' internal newsletters, which offer additional informative and inspirational input, were used to guide the creative process towards the specific challenges to be faced. The users targeted in the creative brainstorming sessions were representing the most fragile categories of our societies, including children and women living in remote rural areas, elderly people living alone in urban spaces and low-income workers in suburban areas of highly populated cities: all affected by specific diseases / mental wellness issues, or with learning and educational access problems. Such issues were identified by desk and field research, and by the NGOs that participated in the workshop. Gaining the insights of real people was the primary task in preparing for the event. It was our belief that only through a deep understanding of people's real needs and aspirations in their physical and socio-cultural environments would it been possible to create a solid opportunity for meaningful and sustainable design interventions.

4. Gathering people insights for a human-focused design

Qualitative and quantitative data gathering focused mainly on emerging and developing socio-economic contexts in which Philips operates: Latin America; Eastern Europe; Russia; India; China. Issues that came under the spotlight included, for example, malnutrition, pneumonia, malaria, sanitation, water purification, air pollution and environmental degradation, energy consumption, lighting, and illiteracy. The selection of issues to be tackled was defined by their urgency, as indicated by the quantitative data collected from various sources. Methods used for data and knowledge gathering included:

- desk research into the databases and reports from international aid organizations, scientific environmental institutes, and sustainable development trend-watchers (UNESCO 2005; UNICEF 2005; WHO 2005; WRI 2005, etc.) to gather global figures;
- interviews with NGOs working in the field[6] to understand both their daily challenges and how they deal with such challenges;
- field visits conducted by our user researchers and designers to observe and/or interview people in their communities and homes, and so gain direct insights into people's life experiences and true stories from specific environments.

More precisely, the information from the NGOs covered questions concerning their work-related problems, as well as their experience of people's living conditions, any infrastructural and technological constraints, solutions currently used and their limitations. Research into individuals was also addressed via face-to-face interviews, observations and focus groups, where possible to leverage the informal regional networks made available by our designers and researchers in the various branches. Knowledge and data collected in the regions were then conveyed to the Philips Design headquarter where they were consolidated into common 'digestible', informative and inspirational formats.

Consolidating informative and inspirational input: 'personas' in local contexts

[5] Workshop speakers were: Derryck Klarkowsky of Médecins Sans Frontières (MSF), an international humanitarian aid organization that provides emergency medical assistance to populations in danger worldwide; Meredith McWade of Save the Children, an organization that provides opportunities for the world's children to live safely and healthily; Dave Irvine-Halliday of the Light Up The World, a foundation that provides white LED lighting solutions powered by renewable energy to the world's poor in remote rural areas.
[6] In addition to the three main NGOs previously quoted, UNICEF should also be mentioned as an initial useful source of information.

Qualitative and quantitative information was matched and compiled into 'personas'[7]: flexible design instruments used to provide insights into 'a-day-in-the-life' of the targeted individual or community. In total, 19 'personas' were created to be used as specific design briefs for the creative session. These 'personas' were delivered in A3 format newsletters: 'The Design Times'. Their aim was to summarize relevant statistics on key issues, together with related informative and inspirational knowledge such as case studies on context-specific technological challenges and emerging opportunities, testimonials, individual or collective stories reflecting people's needs and aspirations, interactions with products and services, and their socio-cultural habits.

In the workshop, 'personas' were key tools in thinking of people-focused solutions. They helped participants to experience the main issues faced by their protagonists in certain geographical and socio-cultural conditions, and they stimulated the imagination of designers when it came to forming possible answers to such issues. In total, 33 healthcare/wellness and education related issues were addressed in compelling stories used as design briefs.

5. Ideation: design process and tools

The workshop participants, representing more than 30 different nationalities, were divided into 46 teams comprising designers and researchers with different backgrounds and capabilities. The teams, made up of five members each, received a specific 'persona' brief to work on, under the guidance of a facilitator[8] assigned to steer the discussion and the design activities. The overall process consisted of four main phases. In the 'opening' phase, employees got to know each other and familiarized themselves with the key global social and environmental challenges. In the 'analytical' phase, they learned about and analyzed the specific issue/s and contexts to be dealt with. In the 'thinking and creative' phase, they explored design ideas and they dealt with their conceptualization and visualization. In the 'promotional' phase, they were asked to market the value of the concept(s) generated to the Philips Design community.

Guideline design tools and templates were made available, but they respected the necessary freedom of thinking and creativity of the teams at all times. Two tools in particular – the 'chain reaction' exercise and the 'design-for-sustainability' design orientation criteria – were used to increase the prospects of envisaging environmentally and socially effective product and service ideas.

'Chain reaction' exercise

With this tool, the teams were invited not just to solve the problem(s) raised by their assignment, but also to understand them by examining related people's socio-cultural values and behaviors, as well as the consequences of these. The teams therefore analyzed every issue through a mental framework linking values/behaviors > problem > consequences, to understand how to break this vicious circle and introduce solutions able to stimulate a new, positive chain to improve quality of life. For example, to understand the problem of indoor air pollution in rural India, the teams connected with:

- its causes - the use of wood and inappropriate stoves, the enjoyment of tasting food cooked on wood, the lack of knowledge regarding possible health-related effects, etc.

[7] 'Personas' are defined here as fictional characters that encapsulate global issues in regional contexts. More precisely, they are representations of certain categories of individuals and groups of people dealing with various issues and quality of life concerns in specific geographical and socio-cultural contexts.

[8] The facilitators were trained beforehand to use a series of supporting design tools and exercises (included in a facilitation notes booklet) specifically developed for this workshop.

- its consequences - respiratory and eye-related diseases, children's healthcare costs, children's time spent in collecting wood, women's time spent cleaning the kitchen, etc.

Then, to overcome the problem, the teams tried to come up with actions that would deliver direct healthcare benefits, together with positive parallel environmental and socio-economic advantages, both at the individual and the community level. For instance, by introducing a smart cooking device, it was hoped that children would have more time to study because they had to spend less time collecting wood, CO_2 emissions and wood consumption would decrease and healthcare awareness in the family would increase, all of which might result in healthcare cost savings and more efficient work activities.

'Design-for-sustainability' orientation criteria

This tool was designed to take into account both environmental and social criteria 'up-stream' in the concept creation phase, and to stimulate a 'system thinking' approach, one that moves beyond technical product changes towards a more holistic concept of innovation. Its aim was to prompt designers with principles and criteria that could support innovative design strategies to influence patterns of production, distribution, marketing and use. Indeed, only by contextualizing technological opportunities, and considering regional and local community requirements is it possible to aim to deliver truly sustainable solutions (Manzini and Jegou 2003, 36-68).

The 'design-for-sustainability' tool made use of five main clusters, and further specific design orientation criteria:

- Design for longevity: aesthetic and functional up-grading; modularity and scalability; durability; recovery in its various forms; etc.
- Design for dematerialization: miniaturization; integration and multi-functionality; virtualization; biodegradability; etc.
- Design for efficient and clean energy: solar / wind power; human power; hydrogen power; hybrid systems; etc.
- Design for cultural diversity: local resources; technologies appropriate to the context of application; traditional smart practices; individual and community empowerment, etc.
- Design for sharing: common use of space, assets, time, knowledge, etc.

A few of these criteria were selected by the designers so that they could set up their own design strategy and specify the potential of their concepts in terms of environmental and social performance.

6. Value co-creation: a 'chulha' for healthy indoor cooking

The intensive burst of focused creativity generated approximately 80 design ideas for products and product-service-systems. Following the workshop, these ideas were filtered by criteria such as their fit with the Philips strategy and social investment policy, their technological feasibility, and their fit with the Millennium Development Goals[9]. The screening, carried out with

[9] In September 2000, all 191 United Nations Members States pledged to meet eight socio-economic and environmental goals by the year 2015. The goals, stated in the Millennium Declaration, include: 1. Eradicate extreme poverty and hunger; 2. Achieve universal primary education; 3. Promote gender equality and empower women; 4. Reduce child mortality; 5. Improve maternal health; 6. Combat HIV/AIDS, malaria and other diseases; 7. Ensure environmental sustainability; 8. Develop a global partnership for development (UN 2000).

various stakeholders, narrowed the number of potential solutions to 20, re-grouped into seven promising clusters considered to be opportunities for intervention. From the various opportunities available, a couple of design ideas were chosen for implementation. The first one to come to life was a low-tech stove that would tackle the respiratory problems affecting the health of millions of people (especially women and children) in the developing world who still cook indoors using biomass fuels[10]. The aim was to design, develop and test an appropriate solution for local cooking habits in rural and semi-urban areas of India. The goal was to provide a wood-burning solution that was:

- easy to access (easy to distribute/install/use/maintain)
- locally produced
- able to reduce indoor pollution
- low cost for replication and scalability.

Within eight months, a three-person design team from Philips Design Pune evolved an initial design idea into a concrete solution tested in the field. In a collaborative effort with local social stakeholders, entrepreneurs, and a few families, they produced two versions of the 'Chulha' stove in an attempt to satisfy people's cooking needs more healthily and, at the same time, stimulate socio-economic activities for local business development (Fig. 1).

Input from various local social stakeholders included a solid contribution from SEDT (Socio Economic Development Trust) NGO for rural development programs and people mobilization in the field, Dhanalaxmi Bachat Gat and Mahalaxmi Bachat Gat, two SHGs (Self-Help Groups) that empower local women to become entrepreneurs.

Particularly instrumental in this humanitarian design project was the cooperation of ARTI[11] (Appropriate Rural Technology Institute), an NGO with considerable expertise in the smokeless cooking domain. ARTI helped the team to scan available technologies and benchmark current smokeless and non-smokeless solutions; identify specific challenges and opportunities for design interventions and scalability; and carry out technology development and field tests.

7. Field research in rural and semi-urban areas

The research previously carried out (for the 'Sustainable Design Vision – Design for Sense and Simplicity' workshop) on indoor air pollution in India was sufficient to provide a basic understanding of the issue and its context, and to feed the initial creative process. However, at this stage, additional knowledge was necessary to develop a truly effective solution: knowledge of people's purchasing power; specific culinary habits; cooking behavior and user interaction with available devices; information on local production and distribution channels, etc.

The design team - with the support of Green Earth, a local sustainable development agency dealing with grass root behaviors and social studies – gathered deeper, more specific insights into people by carrying out research in the villages of Kerwadi, Phaltan, Maltan and Karad, all in the state of Maharashtra. The research consisted of an initial 3-day visit and introductory meetings with people from the villages, followed by one week of observations and in-depth

[10] Total world deaths from indoor air pollution due to burning solid fuels are estimated at 1,619,000 each year. India alone accounts for 25% of such deaths. Almost 500,000 of the victims are women and children (WHO 2000).
[11] ARTI develops and promotes the diffusion of innovative rural technologies to improve the quality of life and standard of living of India's rural inhabitants. It operates in various areas and acts through its training centre located at Phaltan, 120 km north of Pune.

interviews targeting four rural and two semi-urban families[12]. The interviews, conducted in the local language (Marathi), were kept quite informal. All the family members were observed, with particular attention paid to the women who were carrying out cooking activities. The findings were then synthesized and consolidated in 'contexts-of-life cards' describing the women's profile and related cooking activities, the families' way of life, and their environment.

Infrastructural conditions, production facilities and distribution channels for stoves currently in use were investigated using the ARTI network. A needs analysis of stakeholders already active in the business of smokeless and non-smokeless stoves was performed by organizing various focus groups involving local entrepreneurs and self-help groups, in order to understand the major issues they face with regard to current solutions and the replication and scalability of their activities. Focus areas regarding logistical transportation constraints and maintenance were extracted and consolidated in the same format used to summarize the findings from users.

It soon became clear from the results of the research that the key local design requirements called for a cooking solution able to fulfill the following physical and socio-cultural conditions:

- adaptability to different biomass fuels (from wood to cow dung), available in different seasons and locations
- adaptability to people's needs when cooking 'chappati' (bread), steaming rice, boiling water
- adaptability to the use of different, non-standard cooking vessels
- adaptability to various vehicles and distribution channels.

8. Concept development and testing

In both the concept development and the concept prototyping and testing phases, there was a collaborative effort to provide a meaningful response to the product requirements identified. Users' insights, and the findings relating to stakeholders' needs were used in a local workshop involving the various players engaged in the design process (ARTI, SEDT, SHGs, two local entrepreneurs and two users). The workshop, intended to define the key product features desired, involved 16 participants who were invited to share their viewpoints and concerns in informal dialogues. The dialogues were then followed by a session to conceptualize ideal stoves and their expected performance within the contexts under investigation. During this phase, several pages of insights (context-of-life cards) offering a stakeholder's needs analysis - including end-users' needs - were circulated among 'experts' in the production, distribution and use of wood-burning stoves, for their feedback and refinement.

At the end of the workshop, key design features were pinpointed and prioritized as 'easy-to-use and maintain', 'context-specific', 'flexible', 'able-to-radiate-value', and 'accommodating'. These features were visualized into design sketches. In the next step, a fine-tuning process conducted by the design team proposed the following major design innovations:

- modularity to facilitate distribution, installation and reparability of both the stove and the chimney

[12] The rural families had an average of four adults and three children, with a monthly income of between 73 and 184 Euros. The semi-urban families on the other hand had an average of two/four adults and two children, with a monthly income of between 92 and 184 Euros.

- mechanisms to ensure the chimney could be cleaned safely (currently, where chimneys are available, they are monolithic blocks which can be cleaned only from the roof)

- improvement to construction (the weak bridge in current stoves is a common problem)

- flexibility of use for roasting and steaming, additional functional features and appealing design format.

These innovations were incorporated in two versions of our 'Chulha': 'Sampoorna' and 'Saral'. In collaboration with ARTI, both versions have been translated into real applications. The 'Saral' is a double oven with a hotbox which costs between 9 to 10 Euros. The 'Sampoorna' offers a more sophisticated solution, including a steamer, at a cost of around 14 Euros. The stoves and their chimneys are mainly made of concrete modular components, covered with clay. Their modularity facilitates the replacement of broken parts over time as well as transportation (Fig. 2). The stoves can be packed in recycled woven polypropylene bags, which are by-products of waste from agricultural storage, etc. The moulds are made of FRP - fiber reinforced plastic - at a cost of 183 Euros, with the capacity to turn out more than 3,000 pieces.

Prototyping at the ARTI training centre in Phaltan, and testing in rural and semi-urban homes, involved SHG representatives and stove users. Feedback regarding improvements suggested a few modifications to the initial versions of the stove. Design interventions included technical changes related to the manufacturing process to optimize gas flow within the stoves and improve their thermal efficiency, an easier way of assembling components such as self-locking pieces for do-it-yourself assembly, the introduction of a soot collector, and a solution for fixing chimneys to the wall. Modified versions were then installed in 12 homes for further trial and to evaluate their technical performance.

9. Achievements and obstacles

The value co-creation process undertaken during this journey of understanding and learning has resulted in a stove that makes indoor cooking healthier when compared with traditional indoor open cooking fires - a stove that also claims to be simple to use, easy to maintain, produced and distributed locally, relatively cheap, and suitable for different culinary habits. It also helped to go one step further. According to Dr. P. Karve of ARTI, the overall research and design contribution has helped in proposing a "*Chulha that has a better chance of succeeding than other concrete smokeless stoves because it is more attractive, and has improved functional features*" (Karve 2007). It has helped to shape a stove that is easy to handle, from manufacturing to installation and maintenance. "*The 'Chulha' and its chimney are easy to transport thanks to their modular design. They are quick to assemble and broken parts can be easily replaced over time*" (Karve 2007).

The route to reaching these results was not without obstacles, however. Initially, we faced a communication barrier that slowed down interaction with the key stakeholders and end-users, and therefore the entire design and development process. We had to learn to speak a 'language' able to:

- create convergence of different (political, social and economic) interests;

- give 'voice' to 'vulnerable' end-users, bringing their viewpoints into the dialogue with multiple stakeholders with precise, and often consolidated, opinions.

Such a 'language' could be developed only through a long and patient process of 'intensive listening' and engagement. An effort that, in the end, paid off.

Indeed, it should be noted that, among the various cooking solutions already available for low-income people, the 'Sampoorna' and 'Saral' seem to be competitive: their original objectives - adaptation to local culinary habits, use of available resources and infrastructural conditions; value chain optimization; economic affordability[13]; reduction of indoor air pollution – have been reached through careful improvements. With regard to environmental aspects in particular, it has been estimated that, in theory, the 'Sampoorna' and 'Saral' stoves could reduce indoor air pollution from smoke by up to 90% in comparison with indoor open cooking fires. What's more, technical evaluations conducted by ARTI shows that exhaust gases and carbon monoxide emissions were reduced in comparison with other concrete-based indoor smokeless stoves. Specifically, a deeper evaluation of our stoves' technical performance, made by the College of Engineering in Pune, reveals:

- better heat distribution, fuel and thermal efficiency (time and fuel required for boiling 1 liter of water is 11.5 min. and 255 gm for Saral and 14 min. and 315 gm for Sampoorna, in comparison with 22 min. and 415 gm required by traditional stoves)
- higher retention of soot (100 mg for Saral and 80 mg for Sampoorna, in comparison to 20 mg for traditional stoves).

However, no official quality standards of reference are currently available to judge the technical performance of concrete stoves. Various NGOs use different criteria to evaluate performance and different values for acceptable emissions. As a consequence, it becomes difficult to scientifically prove the added value of the 'Sampoorna' and the 'Saral'. At the moment, our intention is to go beyond evaluating the technical performance of our stoves, to fully assess their economic and social performance over the long-term, in order to verify all the benefits they claim to deliver. Current plans include an impact study that will run from October 2008 to July 2009 to monitor a few cases where final versions of the stoves are in use (Fig. 3).

10. Replication and scalability

So far, to facilitate replication and diffusion of the 'Sampoorna' and 'Saral' stoves, design innovations have been recorded in sketches and technical drawings. A comprehensive package of communication and training materials, including posters and videos, has also been created to explain how to produce, distribute, install and maintain the stoves. With the support of local NGOs, the intention is to allow Self-Help Groups and citizens to use this knowledge for free. The hope is that this will create not only better living conditions for the end-users - women and children - but also stimulate local entrepreneurial activities centered on the production and distribution of safe and healthy stoves.

ARTI will continue to play an essential role in all of this. It has included our solutions in its portfolio of stoves ('gas-fired', double wood-burning stove, simple concrete stove) for rural and semi-urban communities, and it trains local stakeholders to produce and distribute the most appropriate solution for the selected target audience, according to income level and infrastructural conditions. The current production and distribution model proposed for the 'Sampoorna' and 'Saral' stoves can easily be adapted as a decentralized model, in which a trained entrepreneur invests in a mould that is able to cover the demand of a couple of villages, with 50-60 households each. However, the aim is to shift to a semi-decentralized model where localization takes place at district level: with this model of scalability, the new entrepreneur will be able to serve up to 30-40 villages, with 200-250 households each.

Besides the activities carried out by Arti, another NGO, already approached us with the intention of stimulating the broad diffusion of the 'Sampoorna' and 'Saral' stoves in the rural areas

[13] Cooking solutions currently available in rural areas cost 2-3 Euros for an open non-smokeless stove made by local craftsmen, and 8 –12 Euros for basic indoor smokeless solutions made by NGOs and local entrepreneurs.

of Karnataka state (Southern India). Knowledge transfer from our side is currently running and scaling up activities from the NGO[14] will start in July-August 2008. Our ambition is to answer requests from NGOs spread throughout India, but also in countries such as Pakistan, Bangladesh, etc., where these stoves can provide appropriate solutions to very similar people's needs and culinary habits.

11. Conclusions

How have design and creativity contributed to sustainable development in this overall humanitarian experience? What are the major lessons learned? Although it is difficult to provide a complete evaluation of an experiment still in progress, when we look back at our original workshop and at the project in India, it is possible to outline certain considerations about the approach used and the results achieved to date.

From the very start of the experience, adopting a process in which designers and researchers operate in a multidisciplinary team, in open dialogue with NGOs bringing knowledge from the field, was essential in ensuring that people's real needs and true aspirations (life stories and user insights) were integrated into the initial creative 'thinking'. This was done not only to raise the level of understanding about sustainable development challenges and quality of life issues, but also to set up ideation sessions related to specific locations and infrastructures, ways of living and socio-cultural habits, to help our work force to envision effective human-centered solutions.

By using design skills and competencies to face crucial social / environmental problems affecting the most fragile categories of our society, employees felt motivated and empowered to make a difference through their own work. The 'momentum' created with this event has resulted in a practical and effective way of pushing forward our organization's social commitment. Since that time, a few employees have started to make use of their free time and training time to do some more work on ideas that came out of the creative workshop. The management has established the 'Philanthropy by Design Initiative' in order to continue the collaboration with some of the NGOs[15] involved at the beginning of this experience.

Along the journey, design capabilities have demonstrated their full range of potential when it comes to contributing to the creation of sustainable value: from the power of creativity in generating a common vision outlining directions for specific humanitarian opportunities, to the importance of design skills in articulating this vision, and even to translating this vision into concrete humanitarian answers. By utilizing a tangible design application, we were able to bring our Philips brand to life and, consequently, establish conditions for a return on brand equity: either by putting an appropriate solution to the problem in place directly, or by enabling local players to replicate and diffuse such a solution autonomously. We have, as a matter of fact, used our design knowledge to go beyond traditional tasks of technical product design. Our designers, often used to working in different domains and across various businesses, have demonstrated that it is possible to assume a steering role in organizing a proper network of competencies, connecting multiple players with complementary expertise, and facilitating a value co-creation process right up to its implementation.

All this has resulted in what M. Porter defines, in one of his articles, as capacity building, organizational learning and input for long term business strategy (Porter and Kramer 2006, 1-15). More specifically, we believe it has generated innovative ways of working that can stimulate

[14] The NGO is setting up a plan with the ambition to reach 250,000 families in five years time.

[15] Beside the 'Chulha' project, we are currently working on a concept to support Médecins Sans Frontières in their task of diagnosing infectious diseases in remote areas, and in training local healthcare workers. It is a solution able to better capture microscope images of the malaria parasite and facilitate quality control of diagnosis in front line health stations and medical camps. The solution can also be used to support educational activities for malaria parasite identification.

social innovation on the one hand, while supporting business innovation on the other. Indeed, this humanitarian project offered us the opportunity to discover new insights when it comes to resolving societal problems within non-familiar realities, triggering the identification of innovation spaces for business growth.

Operating in contexts of developing and emerging economies, we have certainly learned some basic ground rules that should be considered in future projects, especially when addressing 'underserved' people.

First of all, we have realized that an understanding of the local physical infrastructural, economic and socio-cultural conditions is imperative before making any technological choices. The challenge in coming up with an accessible, affordable and sustainable solution for local needs is to evaluate the best technological solution at a given moment in time, rather than opt for the best available technology (which is typical of a technology push approach). With our 'Chulha' for instance, insights from the targeted users and local stakeholders helped us to understand current barriers to cultural acceptance, as well as constraints on replication and scalability. It is on the basis of these insights that we were able to decide on the most feasible and appropriate technological answer to achieve our objectives.

Another thing we learnt is that the design phase should be treated as a continuous and iterative process, which goes backwards and forwards in relation to the feedback received when the solution is tested in the field. Any change and adjustment made to the initial proposition needs to be evaluated in the field, not only in terms of technical performance, but also in terms of possibly wider-reaching effects. For instance, feedback from evaluation of the 'Chulha' gave us information to inspire improvements beyond product and usage performance, to include instructions for easy and cost-effective installation, distribution and production - aspects that have stimulated new design interventions which could result in the optimization of the entire value network.

Last but not least, it should be noted that the co-design approach resulted not only in a way of delivering a solution that better fit the context of application, but also enhanced the potential benefits of the stakeholders involved, democratizing the value creation process, and therefore increasing the chance of implementing valuable solutions for all. Indeed, with this approach, users and stakeholders worked together in a participatory process where they all put their own interests on the table. Key, in this regard, was to go beyond the 'intensive listening' principle described by S. Hart in 'Strategic Initiatives at the Base of the Pyramid. A Protocol for Mutual Value Creation' paper (Simanis, Hart, Enk et al. 2005), to include a 'true engagement', where users were even empowered in the decision making process.

The question facing us now is this: how do we capitalize on what we have learned? Our hope is that we can continue make use of our imagination. It is our belief that imagination, creativity and 'holistic thinking' from design communities - if they are underpinned by solid research to help understand people and their socio-cultural and natural environments - can become important assets to break down boundaries and help move sustainable development forward. After all, at the end of the day, sustainability is, and remains, a collective creative process of change.

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Fig. 1: Overview of the research, analysis and development steps carried out in India. A joint effort for value creation based on user and stakeholder insights (Philips Design 2007).

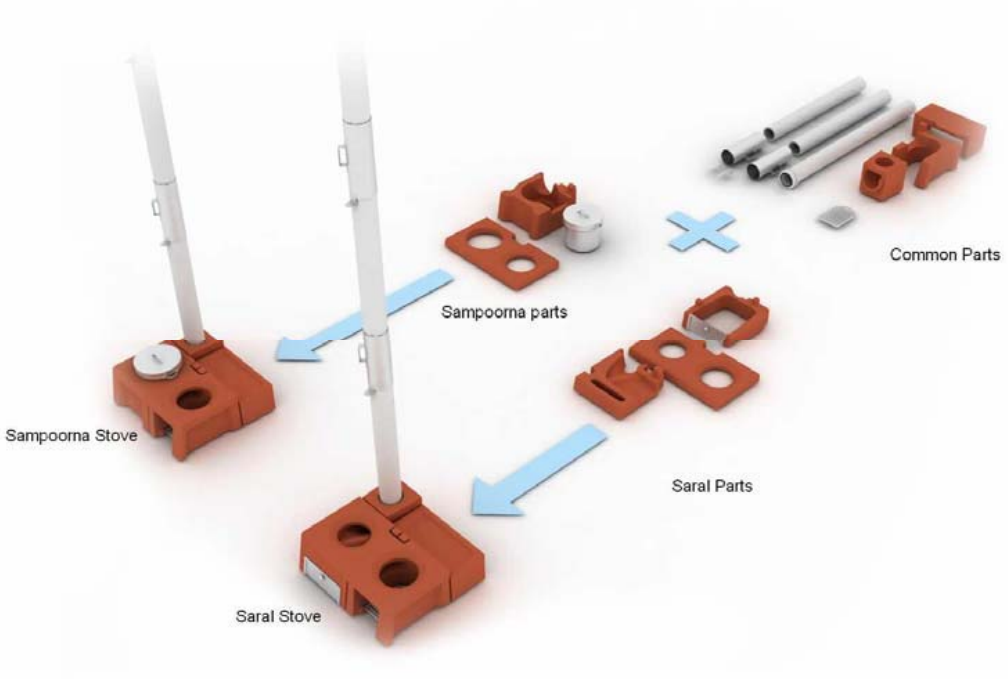

Fig. 2: Visualization of the ‘Saral’ (basic) and ‘Sampoorna’ (complete) wood-burning stoves, and their modular components. Both stoves and their chimney are made of concrete components covered with clay.

Fig. 3: Users of the ‘Saral’ stove in the rural village of Shivri, Maharashtra State, India.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

P-KIT, picture listening for community planning

A simple and effective design research tool for facilitators and habitants in participated urban processes.

Liat Rogel[1]

Abstract

This paper suggests a new possible role for designers in participated urban processes: the creation of tools designed for the facilitation and improvement of communication between stakeholders in urban participated development.

P-KIT is a new and effective toolkit used in six different phases ranging from expressing problems to creating future scenarios. With this kit, problems are discussed using photos made by the inhabitants. It is designed specifically to ensure effective communication in urban areas with a high concentration of immigrants.

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1. Introduction

The idea for this paper and project came about during community planning workshops in the city of Pioltello in the province of Milan. The research unit DIS, design and innovation for sustainability in 'Politecnico di Milano' have been collaborating with Pioltello on social networks for several years. One particular district in Pioltello has a large concentration of immigrants. It is a very interesting and multicultural area with, however, many economical and social problems. The municipality has decided to deal with these problems by using a participatory process that involves the inhabitants. The inclusive processes described below have a lot of advantages, but are hard to perform. "Participation, like democracy, has meant many things to many people. The opportunities for participation are there to be grasped but only if all those involved have a common understanding and share a common language". (Batson 1994,1) When many people are involved, new ways of communication are needed that will allow and stimulate the collaboration between experts and laypersons. In situations where there are language and cultural gaps, circumstances prove to be especially challenging. Understanding and communication between all stakeholders is extremely important.

Facilitators are people that work especially for that aim. They are professionals, usually psychologists, social workers or educators that have a large experience working with people. Interviews with several facilitators, as well as the opportunity to also work as a facilitator, have shown that there are certain communication difficulties that arise during the process. These are solved with the application of certain methods and tools. Research about existing methods for urban participation was thus necessary as the first step of this study. This research has revealed that there are many established theoretical methods created especially for this purpose or taken and readapted from other disciplines. These methods are very helpful, but most of them are also complex. To make them more visual and simple, the facilitators tend to invent tangible tools, for example: questionnaires, opinion-boards, video boxes etc. Most of the facilitators however, have no professional background in visualisation or tool creation and often have no time or resources to develop such skills. These findings have lead to the central question of this project:

How can designers significantly enable the communication between inhabitants and facilitators in order to obtain the best project results?

This question has led to a new toolkit for participation called the P-KIT. The motivations to create it as well as a detailed explanation on how it works are the focal point of this paper. Hopefully, this toolkit could be an inspiration for a whole range of new opportunities for designers.

2. Short background

To better understand the reasons for this paper it is worthy to note some details about urban participation.

In social scientific theory, participation is an umbrella term that includes different means for the public to directly participate in political, economic, managerial or other social decisions. Ideally, each actor has a voice in decisions directly proportional to decisions that affect him or herself personally. Participatory decision making infers a level of proportionate decision-making power and can take place at any level of human social activity, including economic, political, cultural etc.

It is hard to say exactly when citizen participation in urban development began. Many consider two important initial experiences in England and the United States. In the eighteenth and the nineteenth centuries in England, there were major developments in urban studies, caused by the industrial revolution. Very innovative views and actions can be found in the works of Patrick Geddes (1854 - 1932) and Peter Alexeyevich Kropotkin (1842 -1921). Unfortunately their ideas could not overcome the negative effects of industrialisation at the time. In the United States,

participation has had a long history, from the early beginnings of nation's formation. Thomas Jefferson's model of self-help, the early community barn raising and others, clearly prognosticated the 'Community Design Centres' of the XIX century. (Lorenzo 1998,39-45) With protest movements of 1968 in Europe, the 1970s began as a fertile period for participation. Many architects embraced citizen participation in different ways. Renzo Piano's work in Ottranto and Carlo de Carli's in Terni are good examples for understanding the character of that moment in Italy.

A crucial step took part in the 1990s. Participation was integrated in urban development programs as part of the agenda 21 and contributed to the diffusion of this practice. In certain countries, participation has become obligatory on some levels. Different urban development programs like CdQ (contratti di quartiere) in Italy, or URBACT on a European level include citizen participation as their main concern. That means that the ideas of citizen involvement are not left to the idealism of a few but are becoming an integral part of urban decision-making procedures.

3. Participation - circumstances and difficulties

To participate means to take part, share decisions and influence processes towards achieving solutions. This is a non-innate capacity, but one that must be gained through study and practice, or in other words, through an educational process. Consequently, the choice to work with inclusive processes is a significant decision wherein one must consider the difficulties and benefits. According to Rymond Lorenzo (Lorenzo 1998,72) the most important characteristics of a participatory process include:

- Sharing the nature and aim of the process with all stakeholders from the beginning;
- Adapting customs, tools and timing to the personal and professional characteristics of the involved subjects and to the context in which the process takes place;
- Evaluation of competences and locally available resources;
- Systematic and continuous involvement of all participants in analysing and evaluating the process itself and its final results.

The participatory process involves dealing with a relatively large number of people, the heterogeneity of the group and the integration of non-specialists. The most common difficulties that arise in this situation are:

- Different views of problems
- Communication difficulties
- More conflicts

A participation strategy should be decided on from the beginning. Various occasions must be created with ad-hoc tools that facilitate the practice in the best possible way, with consideration of context, age, attention capacity, willingness and responsibility (contratti di quartiere II). To achieve this kind of strategy, it is extremely important to provide a comprehensive education for social operators, facilitators, technicians, politicians etc. The effort of using an inclusive process has many advantages in the short and long-term:

- Creating relationships and networks between all stakeholders - individuals that can become part of an independent teamwork in the future;

- Achieving sustainable results and therefore avoiding NIMBY[2].
- Creating a strong emotional involvement within the community and the neigborhood;
- Building a collective awareness of joint responsibility

Of all the stakeholders, those who work most of the time “on site” are the facilitators and habitants. Facilitators find themselves in various situations, dealing with many different kinds of communities. In order to build a participation strategy, they use certain methods and tools. Luigi Bobbio (Bobbio 2004, 55-56) divides the methods in 3 major categories:

- Methods for listening: techniques that help in understanding the problems and needs of the stakeholders. This can be used in the preliminary phase of participation to understand the most important issues and identify the most important actors.
- Methods for constructive interaction: techniques that assist the participants to communicate and produce interesting conclusions. These are used during the whole process.
- Methods for conflict solving: techniques that are made to confront controversial positions, and are applied when conflicts arise.

To make these methods easier to use, facilitators tend to invent tangible tools. Tools can also be divided depending on the function they fulfil, the principal functions are:

- Expressing opinions: about the situation or about participation
- Expressing problems: talk specifically about existing problems
- Expressing needs: what is missing, needed, or desired.
- Making Decisions: choosing which problems to approach
- Giving priority: making a strategic plan out of the choices
- Planning: the actual planning of solutions. It is a very vast role that can be divided between many participants.

With the exception of ‘planning for real’[3] the other tools are not ready-to-use toolkits. Descriptions of these tools exist, but one should address them individually. Furthermore, only ‘planning for real’ covers a large range of activities. One can work through the whole process, using only ‘planning for real’. Facilitators could benefit from more “ready to use” toolkits. The creation of such toolkits belongs to the repertoire of abilities of a (good) designer.

4. Design and participation

Participation is not new to design. In usability and human centred design disciplines, for example, final consumers are often involved in all phases of the (commercial) design process. Designers have some special abilities that are beneficial for participation processes. On the one hand, there is a general consideration of many factors and actors before approaching solutions. On the other hand, designers have an ability to invent new ways of communication and visualization. In urban participation, where everyone is called upon to design, designers cannot be

[2] NIMBY is an acronym for “Not In My Back Yard.” The term is used to describe opposition to a new project by residents, even if they themselves will benefit from the construction. Often, the new project being opposed is generally considered a benefit for many, but residents nearby the immediate location consider it undesirable and would generally prefer the building to be "elsewhere".

[3] "Planning for Real®" is a whole process of community consultation. It begins with contacting the local community networks and reaches a conclusion with the formation of an Action Plan for taking forward the decisions made during the process. It was created and distributed by NIF - The Neighborhood Initiatives Foundation.

seen as the ultimate solution-inventors. They can however answer the need for new tools to sustain the communication between non-specialists. Those tools could be placed in the hand of inhabitants and facilitators, providing them with some of the designer's capacities to work with and towards the best project results. What follows is a personal experience that has led to the invention of such a tool.

5. Project brief

Fig. 1: moodboard, Cimarosa 1

In February 2006, a community-planning workshop took place in Cimarosa street number one in Pioltello (province of Milano). Cimarosa one consists of five residence buildings that perform as one. 800 people, from 30 different countries live at Cimarosa 1. Most of these people have, for different reasons, severe collective debts. The idea of the workshop was to create some services that could help them overcome their economic problems. To achieve this goal it was necessary to involve as many people as possible and to get their opinions and ideas. It was a difficult task because of the heterogeneity of the group and the fact that most of them didn't speak Italian. People with linguistic difficulties have many worries when it comes to participation. On the one hand they feel that they are not able to understand enough. On the other hand they cannot sufficiently express themselves. Some of them, therefore, will decide not participate at all. Embarrassment and feelings of inequity are frequent problems of foreigners in participatory settings. From the beginning, there was a clear need for new communication strategies. A new tool-idea was invented to facilitate the listening phase, and cover a wide range of roles.

The first phase in participation is listening. It is very important, not only for the determination of aims and actors, but also for building a trust-relationship between the habitants and the facilitators. This is a very difficult phase for foreigners since most of the used techniques are based on verbal language. The new tool was conceived for facilitating the process and alleviating stress during interviews and discussions. This tool covers the roles from expressing an opinion to building a small strategic plan. These roles are particularly related to the listening phase. It was important to cover a large number of roles and create a progression by using the same tool.

The apparent linguistic problem in Cimarosa 1 led to the choice of a particular visual language - photography.

6. Photography and participation

Several reasons had led to the choice of photography:

- Facilitated expression: Photography is used for tangible/visible problems. It is extremely easy to show a problem and not to have to describe or explain it. Sometimes one picture can lead to a constructive conversation about other similar problems.
- A testimony of existing problems: Photography is considered by most of the people as an objective way of expression. This detail is useful for dealing with diffidence problems, often found in a situation like Cimarosa 1.
- An international language: in contrast to other visual languages, photography can virtually overcome cultural differences. “Photography is the only language understood in all parts of the world and bridging all nations and cultures, it links the family of man...” (Gernsheim quoted in Sontag, 1973,192).
- There is a strong relationship between the photographer and what he/she photographs. The person that chooses to photograph a problem immediately begins to resolve it. From the moment one photographs, one immediately becomes a part of his/her surroundings. Feeling a part and a sense of belonging, are essential for long-term results. “To photograph is to appropriate the thing photographed. It means putting oneself into a certain relation to the world that feels like knowledge --and, therefore, like power ” (Sontag 1973, 4)
- In the new participation tool, photographs have different meanings. First they provide evidence of the problems in the eyes of the inhabitants. In the second phase they act as conversation stimulators or discussion initiators. In the last phase, every participant has the opportunity to imagine something different for the future. The pictures represent something in the present the must be changed for the future.

7. P-KIT

With the above brief in mind, a first version of the toolkit was created. The first version of the P-kit was created with a priority board and photo cards. The cards represented major problems in Cimarosa 1 and were made with photographs taken by the facilitators[4]. On the board there were six numbered spaces for positioning the cards. During an interview, the facilitator would take out the kit in order to stimulate the conversation and concentrate on concrete problems. After that, the person interviewed was asked to choose six pictures and position them on the board. At the end of the interview, the facilitator photographed the board and kept the results for further work.

Several advantages and problems were identified. Using the kit did help break the ice between the facilitator and the occupants of Cimarosa 1. It helped the habitant express him/herself better and focus on concrete problems. The kit looked professional and thus inspired trust.

Nevertheless this was not enough. Some doubts arose about the different activities and who must accomplish them. Below, the activities and their distribution in the first p-kit:

[4] The pictures were taken after an information exchange between the facilitators and people from the municipality who were associated with Cimarosa 1 for a long time.

Activity	Facilitator	Habitant
Take pictures	X	
Choose pictures for the kit	X	
Conversation	X	X
Choose 6 main problems		X
Give priority		X

The first two activities, taking photos and making cards, were initially carried out by the facilitators alone. Using the kit showed that the early involvement of the inhabitants in those activities could be very helpful. Taking photographs, as mentioned above, cannot be seen as an objective activity and therefore should not be left to people from the outside. Another critique that arose was the identification of a missing activity. The first kit ended by making a small strategic plan but neglected to give the people an opportunity to talk about their desires. It is very important to discuss problems, but this inevitably concentrates on the negative side of the situation. A positive point of view was crucial in order to open the way for a successful planning project.

In the end it was important to involve as many people as possible, and so another board was added to the kit - the collective priority board. The final version of p-kit had the following activities:

Activity	Facilitator	Habitant
Take pictures		X
Choose pictures for the kit	X	X
Conversation	X	X
Choose 6 main problems		X
Give priority		X
Imagine a future scenario	X	X
Catalogue and exhibition	X	X

To achieve the final requirements, the definitive kit is made up of the following elements:

1. Facilitator's handbook
2. Photo cards
3. Individual priority board
4. Collective priority board
5. Future scenario card

Fig. 2: The components of the p-kit

Each element of the kit is explained below, followed by a step-by-step explanation of the whole process.

Facilitator handbook: Instructions for use and explanations of method**.** This is the only part solely dedicated to the facilitator. In this small handbook there are instructions for use, detailed descriptions of every part of the kit and explanations about the methods that are used during all phases. This last part is particularly important, as it opens a wide range of new ideas for facilitators. There are references and reading suggestions about the methods. The six phases of the p-kit, together with the methods that go along with them, act as guidelines for participation. Depending on their personal experience in the field, facilitators may choose to integrate other methods, to follow some or all of the steps offered in the p-kit.

Photo cards: Photo cards are made of rigid paper, on which one can position a picture and cover it with a transparent sticker. The choice to not simply use printed pictures can be argued in two ways. On the one hand, a technical or official look inspires trust. This aspect has been considered for the whole kit. On the other hand, the act of making the cards (see step 2) is important for the overall process. The cards are made to contain standard 10x15 pictures.

Individual priority board for one-on-one interviews: The individual priority board is similar to a game-board. On this board there are 4 numbered positions in the size of the photo cards. There is also a designated space for the person's name and a general title.

Collective priority board/poster for a public meeting: This collective board is made in order to involve multiple individuals in prioritizing their problems. It is a big poster that is divided in 4 columns. Above each column there is a space for a picture card. Only the public can decide which one of the four is more important and mark it with a sticker.

Future scenario card: The importance of this card is the passage from real to desirable. In the upper part there is a space for the chosen picture and bellow it a space for a future scenario. Participants can use any method they want to describe the future scenario. They can write, draw, make a collage etc. When competed, this card becomes a desired “before and after” picture.

8. Using the kit step by step

The kit is made to guide the participants in a few important steps. Following these steps helps to achieve important solutions, but it is also helpful for the facilitator-habitant relationship. The path these two actors walk together will deepen their relation and subsequently their trust in one another. This will be very helpful to the process that follows the phase of listening.

1° step: The first thing to do is a neighbourhood walk[5]. In this walk, the facilitator has the occasion to learn from the inhabitants, directly on site, and to find out what their main problems are. The facilitator learns new things about the area and the inhabitant experiences the first feeling of empowerment. He/she can teach someone about his/her neighbourhood. He/she is the expert (Sclavi, 2003). The active participation of the local residents in this phase is crucial for the rest of the process. During this walk, the inhabitants will take pictures of what they recognize as problems. There are no choosing criteria in this phase. Each participant is free to decide what he wants to photograph.

2° step: During a Focus group[6], the inhabitants are asked to choose no more than 20 pictures to transform into photo cards. The most important thing in a focus group is the interaction between participants. It is important in this phase to involve other stakeholders like politicians or businessmen and women in order to stimulate a discussion about all kinds of problems from different points of view. The first choice of pictures is significant. It is also possible that during the discussion, a lack of some pictures may be perceived. In this case they should be prepared for the next phase. There shouldn’t be a real conflict in this phase because of the great number of pictures.

3° step: This step is built from a series of personal interviews. The facilitators dedicate around 40 minutes to each participant. During this time, the participant may express his/her needs and problems and finally chooses four precise problems and gives each one a priority number. In these interviews there is a unique opportunity to get to know the inhabitants in depth. One has enough time to talk, and by not having anyone around, he/she doesn’t refrain from expressing everything he/she thinks. It is an excellent chance to collect stories and thoughts. Furthermore, the inhabitant is now directly involved in making a strategic plan for the solution of his/her own problems. The power to choose is directly in his/her hands. Even though he/her is not the only one to decide, in that moment someone is interested in his/her personal opinion. The facilitator has the freedom to decide when to pull out the individual priority board and ask the participant to give a priority. Using the board will help break the ice, concentrate on particular problems and remind the inhabitant of others. When the interview is over, the facilitator will take a picture of the complete board in order to conserve the results.

4° step: ‘Collective priority giving’ establishes an important channel between individuals and the group. After the facilitators have carried out the personal interviews, they are in a position to choose 4 pictures and ask the public to choose the most urgent one. It is important to create this occasion in a public place, for example in the neighbourhood community centre or the local market. The collective priority board will be positioned there and a facilitator or an active citizen will give each participant a sticker in order to express the most urgent problem. In this way there is a good chance that new people will get involved. A central location is also important in order to stimulate discussion. The best results of this step are the discussions the board may impart. Indifference is one of the behaviours that participation tries to avoid. At the end of this step there

[5] This is a method in which the stakeholders go to explore the area on foot. All participants are equal in this walk and are there to learn and teach about important elements of the neighborhood.

[6] A focus group is a form of qualitative research in which a group of people is asked about their attitudes towards a product, service, concept, advertisement, idea, or packaging. Questions are asked in an interactive group setting where participants are free to talk with other group members.

will be one or two problems with which to continue on to the next step.

5° step: The fifth step is called ‘from reality to a desired situation.’ In this phase, one finally has the opportunity to express his desires regarding the future of actual situations. This step will be handled as a brainstorming[7]. Many people are encouraged to participate in small groups. Every group will discuss a future scenario for the one or two pictures previously chosen. As a result, the future scenario card will be complete with a description of the group ideas. The group can write, draw or use any technique to explain their idea. They can also make several cards. As with any brainstorming, the basic rules are: focus on quantity, avoid criticism, welcome unusual ideas, and combine and improve ideas. The solutions should not be thought through all their details. These are just first ideas and wishes. Even if they seem to be too imaginary or unrealistic, they might lead to real solutions. This step remains optimistic and positive and people should be ready to express their dreams about where they would like to live. When every group has completed one or more cards, everyone can share the ideas with the other groups. The facilitators will act as moderators for each group and will take care that every card is completed and clear enough to be presented in a small exhibition.

6° step: The ‘before and after’ cards are presented in an exhibition in a central location. The exhibition should include other materials such as pictures documenting the whole process, videos or other items that explain how the process was carried out and who was involved. The exhibition is important in order to valorise the work of all the people that have taken part. It is also an occasion for convincing other people to participate. The exhibition itself is a result of the p-kit process but is only part of a greater participation process towards reaching valuable solutions. One can use the exhibition for collecting further opinions from the visitors. Encounters with various stakeholders can be held during the exhibition too.

9. Results and Conclusions

Using the kit in its final version has had successful results. In addition to the advantages of the first version, the local citizens were involved from the very beginning, while each step encouraged more people to participate. The pictures that the inhabitants took, expressed some problems that the facilitators would not have identified on their own. Problems were discussed in a serious and responsible way during the focus groups and interviews. There were many discussions about the most urgent problems to choose from. These discussions were eventually positive, as they created an opportunity to discuss different issues and showed that there can be many different approaches towards finding solutions. It was also clear that the choice of only one or two problems did not mean that the others would not be approached. The most important results were the relationships created between the participants. Even those that spoke accusingly about particular neighbours in the beginning were able to establish partnerships with those same neighbours. Some independent initiatives took place right after the p-kit process. For example, two “enemy neighbours” decided spontaneity to collaborate and paint the entrance to their building.

The main deficit the kit has is the representation of non-tangible problems. Most of the problems in ‘Cimarosa 1’ were easy to show. But what can be photographed when the problem is not visual, like people’s behaviour or organisation difficulties. This problem was initially solved with written words, but a different solution could be developed as an additional step for improving the kit. Other elements that could complete the kit are small exhibition and catalogue tips. Moreover, it would be very useful to try and use this kit in different contexts.

In a situation in which everyone is called upon to design their own solution, new definitions and discussions about the designer’s role are important. In participation processes, the creator of the solution is not usually the designer. P-KIT represents an effective design research tool that

[7] Brainstorming is a group creativity technique designed to generate a large number of ideas for the solution to a problem. Alex Faickney Osborn, an advertising executive and one of the founders of BBDO, in a book called Applied Imagination, first popularized the method in the late 1930s. Osborn proposed that groups could double their creative output by using the method of brainstorming.

can be placed in the hands of inhabitants and facilitators, providing them with some of the designer's capacities to work with and towards best project results.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

A Study on the Framework Development for Context Analysis in Smart Home Environment

With emphasis on user's intention and behaviour

Sumin Ryu[1], Yuri Kim[2] and Jiwon Song[3]

Abstract

Designing smart home means designing system, object, and services for the future homes to improve user's life. To design a smart home to support user's domestic life, understanding the context of the life is crucial.

The purpose of this study is to analyze domestic context and develop a visualized framework of it so that a designer can apply the analytical framework for future smart home research and design. The analysis and the framework in this study are particularly focused on user's intention and behaviour. We belive that this understanding on user centric-context could provide fundamental clues in designing smart home fit to user's reqirements.The framework is visualized to provide clear understanding on complex domestic context which has dynamic feature. We expect that the visualized analytical framework would help the future domestic design by assisting in selection of appropriate service for certain context.

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1. Introduction

1.1. Background and Aims

Computers are everywhere, all around us in modern society, and becoming part of a ubiquitous networked environment. This change as it impacts upon the environment of a smart home is part of an active study currently underway. The smart home environment exists in a surrounding environment, using information from a wide range of consumer information and present user behavior patterns. Designing a smart home means designing for the future systems, objects, and services intended to improve the user's life. In order to design a smart home that supports its user's domestic life, understanding the context of that life is crucial.

To begin, the needs of smart home users and the life patterns of those users at home should be recognized in order to advance smart home study. The behavior of users can be analyzed as part of the method. Behaviors, as expressed on the outside, can be divided by many kinds of intentions. These intentions are affected by context. Context, at the same time, can be changed by intentions. That is, there are close connections among behaviors, intentions, and contexts, so it is important to determine contexts focusing on users and then to find needed information according to that determination, strategically, in order to design a smart home. Nevertheless, the study is centered on the user context where there is a lack of related research, with most of the focus on the technology sector.

The purpose of this study is to analyze the domestic context and develop a visualized analytical framework of it that a designer can apply to future smart home research and design. The analysis and the framework in this study are particularly focused on user intentions and behaviors. The framework is visualized to provide a clear understanding of complex domestic and dynamic contexts. We expect the visualized analytical framework will aid future domestic design by assisting in the selection of appropriate services for certain contexts.

1.2. Methods and Scope

This study was conducted as follows:

First, we redefined the context of the smart home and reselected the basic elements of the context based upon references in the context and the smart home research area. Our definition and basic element selection was affected by the work of Dey et al. and Jang et al. and the researcher's 5W1H (Who, What, Where, When, Why, How) elements. Then we classified the elements into physical context, user context, and interaction. The user context includes that of family members, and the user's intentions and behaviors. Object, home space, and time are included in the physical context. Interaction is associated with physical and user contexts.

Second, we analyzed user behaviors and contextual elements by observing the real domestic environments in three Korean homes. We patterned them after classifying the elements of context that cause such intentions and behaviors to arise.

Third, we developed a user context-centered framework on the basis of elements taken in concrete form and visualized. In the visualized framework, user intentions that generate related behaviors are centered. The main elements of the context are given access to intentions. After approaching the intentions of the user, we were able to understand user needs quickly from an overall view. We visualized various domestic intentions. In this study we introduce four visualized events based on the framework. These are inviting guests, getting ready to go out, holding family councils, and caring for a baby.

2. Theoretical Background for Conceptual Definition

2.1. Concept of a Smart Home

A smart home is one 'of life environment', and so supports quality of life, environmental friendliness, the realization of a ubiquitous computer environment by which equipment, wherever, whenever in the home uses home networking and the Internet on the basis of wired and wireless communication and digital information.

Smart home means that everything exists and reacts with users as the central figure, social, technological, physical space mutually giving feedback such as Fig.1 to understand it on the basis of these definitions. The living space (Fig. 1) includes three structural components: the social space, the physical space and the technological space. The social space consists of the members of the household, the activities performed by them in the home, the time spent on those activities, and the interactions between the members of the family. The physical space refers to the physical layout of the home and its constituent parts (kitchen, bedrooms, bathrooms etc.) The technological space consists of the household technologies that are embedded in the physical space and used by the members of the family as part of the social space. The structural concept of the home does not exist in a vacuum. It is related to the organic aspects of the home.[4]

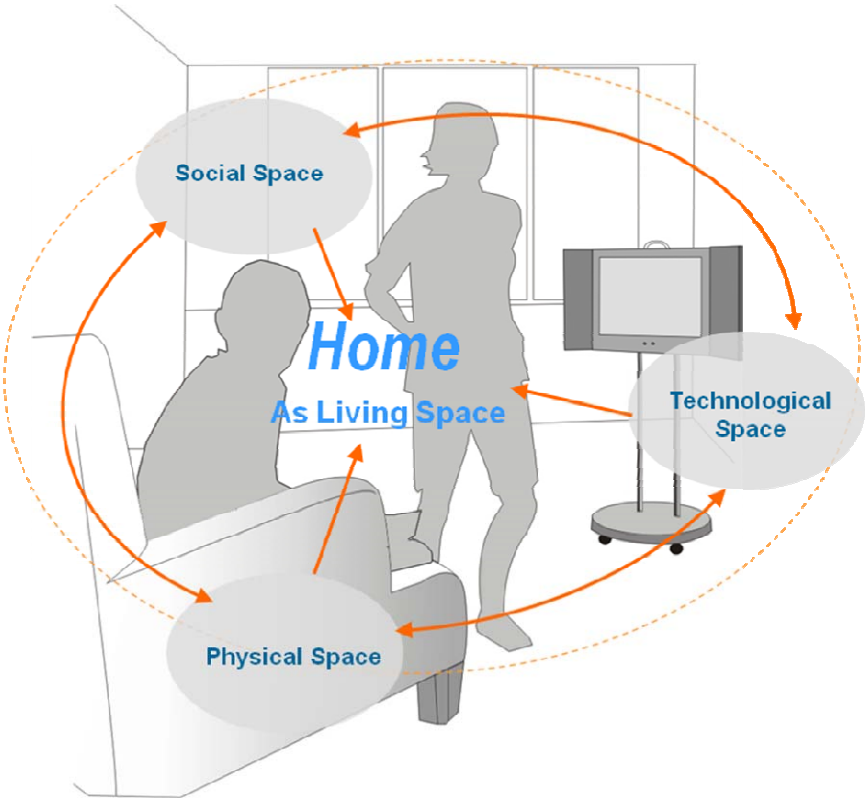

Fig. 1: Concept of Smart Home

[4] Venkatesh, A. Kruse, E. and Shih, E. 2003. *The Networked Home: An Analysis of Current Developments and Future Trends,* Cognition, Technology & Work, 5, 1, 23-32

2.2. Concept of the Context

Context is often translated as ‘line of thought’, ’relationship of sequence’, ‘the state of things’, and ’background’, and the dictionary definition is ‘a state or situation mutually related in the case that something exists or happens’. However, the concept of context used in the ubiquitous environment has no single definition.

Context is defined, for instance, as “location and the identity of nearby people and objects” (Schilit & Theimer, 1994, quoted in Dourish, 2004), or “location, identity, environment and time” (Ryan et al., 1997 Ryan, N., Pascoe, J., & Morse, D. (1997). Enhanced reality fieldwork: the context-aware archeological assistant. In V. Gaffney, M. van Leusen, & S. Exxon(Eds.), Computer applications in archeology. British Archaelogical Reports, Oxford, UK.Ryan, Pascoe, & Morse, 1997, quoted in Dourish, 2004). So location is part of context, but context is far more than location (Schmidt, Beigl, & Gellersen, 1999).

Dey et al.(2001)[5] defined context as “any information that can be used to characterize the situation of an entity,” where “an entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves.”

Jang et al.’s(2005)[6] “User-centric context” refers to information that decides which services and what kind of actions will be automatically triggered according to user’s requirements. Of course, various contexts such as environmental, computational and user’s information can be exploited by context-aware services. However, he believe that user-centric context can be fundamental clues to be aware of user’s implicit expression to trigger services with assumption that a goal of ubiquitous computing is to provide user-required services in any where at any time. As a first step to represent context for services, he focus on user-centric context. In addition, to simply represent user-centric context, he classify the context into 5W1H which is independent of the specific purpose of any service. 5W1H is a popular way to describe a fact with “Who, What, Where, When, How and Why”. 5W1H that is applied to unify user-centric context depicting “a certain user (Who) is”, “in a certain location (Where)”, “in a certain time (When)”, “paying attention to a certain object/service (What)”, “representing a certain expression with physical signs (How)”, or “because of a certain intention or emotion (Why)”. User-centric context, in terms of 5W1H, can provide applications with basic but enough information to trigger appropriate actions.

The elements of context in this study refer to those in smart homes. The smart home is defined as an intellectualized life space for the pursuit of an intellectualizing life environment, an environmentally friendly life and an innovating quality of life. The domestic environment is made up of complex contextual elements in which family members and objects exist together. Therefore, it is important to understand the relationships among the complex contextual elements in order to comprehend them.

These are defined as centering around technical service. They needed to be reinterpreted as focusing on users. Therefore, in this study, we selected the concept of Dey et al. stressing the interaction and the concept of Jang et al.’s 5W1H emphasizing the context centering around users. We used the combination of selected concepts as the concept of this study. Complex knowledge is needed to realize a smart home. It is a means by which to attain all possible knowledge in analyzing and collecting context. Jang et al.’s 5W1H is one of the most suitable methods by which to explain some situations. It was selected as a main concept because it inclusively and exactly explains the situational information of users.

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[5] Dey, A.K., D., Abowd, G.D.,& Salber, D., 2001, *A conceptual framework and a toolkit for supporting the rapid prototyping of context-aware applications*, Human-Computer Interaction, 16

[6] Jang, S., Shin. C., Oh. Y., and Woo, W. 2005. *Introduction of ‘ubiHome’ Testbed,* The first Korea/Japan Joint Workshop on Ubiquitous Computing & Networking Systems.

2.3. Contextual Elements in the Smart Home

It is essential to know such elements of context as users, time, space, actions, etc., in the study of a smart home. Using concept as defined by Dey et al. and Jang et al. among other past researchers, we classified those elements suitable for the environment of a smart home (table 1).

Table 1: Context element in the Smart Home

Conceptual elements	Conceptual definition	Smart Home environment
Who	User	Home Members
What	Object	Object
Where	Home Space	Home Space
When	Time	Time
How	User Behavior	Behavior
Why	Intention	Intention
W-W	Interaction	Interaction

Looking at the above table, ‘W-W’ expressing interactive concepts is added to the conceptual elements 5W1H defined above. ‘W-W’ is named by the researchers of this study and it means Who-Who, Who-What, Who-Where, etc. In other words, it means interaction with various contextual elements. The reason for adding ‘W-W’ to the element of context is to more closely approach understanding the intentions of the users. It is also important to look at only each element. However, the intentions of the users are collected recognizing how interaction occurs between the users and other physical elements. This is connected with the viewpoint centering around the interaction of Dey et al. It is defined as each user, object, home space, time, user behavior, intention, and interaction. Based on this, we express the elements in the smart home environment as home members, objects, home space, time, intentions, behaviors, and interaction.

These factors can be categorized as either user context or physical context. User context includes home members, intentions, and behaviors. Physical context includes objects, home space, time, and other family members/others. Interaction is a component connecting user context to physical context. The physical context affects the user context, two contexts very closely connected to each other.

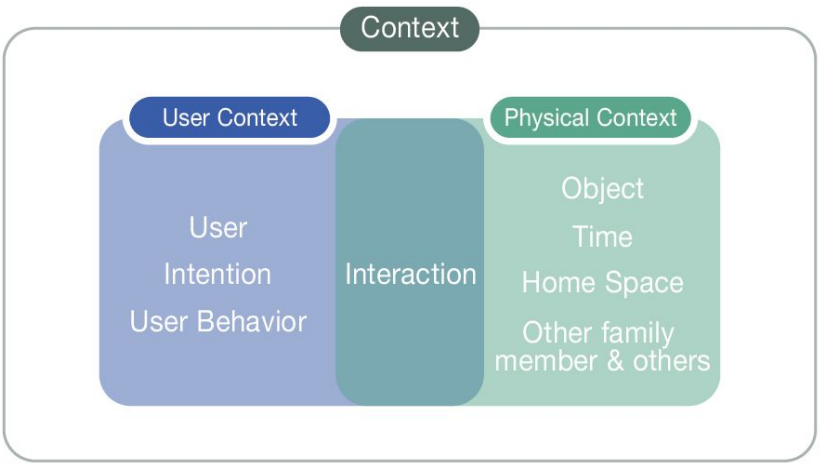

Fig. 2: Category of context element

3. User Observational Research on Domestic Behavior

3.1. Overview of Observation

Observational research was conducted in order to understand how each element in the domestic context is related. The detailed purposes are as follows:

- to determine the patterns of behavior actually undertaken at home
- to understand the intentions or purposes in carrying out the behaviors
- to understand the physical context that affects behavior and intention

Three homes were selected as the objects of the study and we observed them, given these purposes. Home A is a family comprised of four people in 66.12 m². There are two children, 2 and 4 years old. Compared with the other two families, this family is young and has younger children. Home B is a family comprised of five people in 99.17 m². There are three children, 19, 25 and 27 years old. Home C is a family comprised of four people in 66.12 m². There are two children, 25 and 27 years old. Homes B and C are distinguished by house size and the number of children, even though of similar ages. Detailed profiles of each family are tabulated as table 2.

Table 2: Participant Profile

	Home members	**Age**	**Occupation**
Home A	Father	33 years	Office worker
	Mother	33 years	Housewife
	Older son	4 years	Kindergarten
	Younger son	2 years	-
Home B	Father	55 years	Office worker
	Mother	51 years	Nurse
	Older daughter	27 years	Graduate student
	Younger daughter	25 years	Office worker
	Son	19 years	High school student
Home C	Father	58 years	Office worker
	Mother	50 years	Cook
	Daughter	27 years	Office worker
	Son	25 years	Office worker

3.2. Methods of Observation

We stayed in each home for a day and took notes while observing the behavior of each family member. Note-taking involved the use of observation sheets based on the contextual elements of table 1 such as actions, time, home members, home space, etc. We came to understand reasons, intentions, frequency, etc., through supplimentary interview.

4. Analysis of Domestic Behavior Patterns and Intentions

4.1. Methods of Analysis

We analyzed the collected data from three homes through the affinity diagram method. First, we materialized behaviors grouped through post-it grouping (see table 3). Second, we came to know intentions by centering on patterns of behavior (see table 4). Third, the behaviors were rearranged by centering them around intentions again (see table 5). The rearranged table was used as a basic material when visualizing later.

The intentions of each behavior were gathered through user interview during the observation period. We analyzed what intentions are affected by what kinds of context after understanding various of these. The procedure for analysis is the same as in fig. 3.

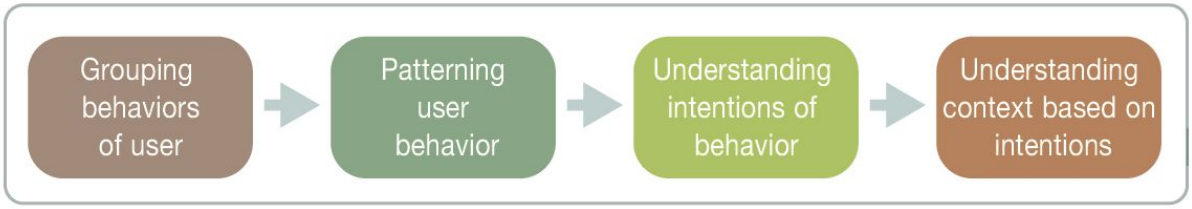

Fig. 3: Progress

4.2. Analysis of User Behavior Patterns

The behaviors of the users were divided according to their common features. As a result, the behaviors of the users could be divided into eight types: entertainment/hobbies/education, toilet hygiene, communications, security/safety, cleanliness/hygiene, food, breaks, management. Representative behaviors for each type are listed in table 3. It was patterned by centering around general behaviors, although there were many details other than the behaviors included in the eight types.

Table 3: User behavior pattern

Type	Representative behavior
Hobbies/Education /Entertainment	Doing computer, Watching TV, Reading books, Listening to music and radio, Exercising, Studying, Other hobbies
Toilet hygiene	Urine and feces
Communications	Calling, Conversation, Health/Greeting, Care
Security/Safety	Safety checks, Locking a door
Cleanliness/Hygiene	Bath/Shower, put on and take off, Dressing up, Personal hygiene(gargle, Face washing etc.), Arrangement, Cleaning, Washing the dishes, Separate collection, Ironing, Laundry
Food	Preparing a meal, Taking a meal
Break	Sleeping, Rest
Management	Energy management, Financial planning, Health care

4.3. Analysis of User Intentions

In this research, we came to know intentions by focusing on the representative behaviors as categorized above. We analyzed the context regarded as important in centering on these intentions. For example, a behavior like 'preparing a meal' was arranged by order of behavior – intention – and the important context such as preparing breakfast – time; preparing a meal for an invited guest – user/time; preparing a meal for self-satisfaction – user/object; preparing a meal for health care – user/space of home.

The intentions were analyzed via the interviews conducted during the observational research. The researchers carried out discussion to learn of more intentions. Two external researchers are included in this discussion to verify the connections between intentions and behaviors. Intentions by behaviors and physical contexts are listed in table 4. Then table 4 was rearranged by centering around intentions again (table 5). Rearranging table 5 made it easy to develop a framework. The contexts were readjusted by each intention and more concrete intentions were added when rearranging them.

Table 4: Behavior- Intention- Physical contexts

Representative Behavior	**Intention**	**Physical contexts**
Computing	Acquiring information, Entertainment, Business	object, space
Watching TV	Entertainment, Break	object, space
Reading books	Leisure, Acquiring information	object, space
Listening to music and radio	Leisure, Break	object, space
Exercising	Health maintenance, Diet, Fitness Management	object, others, time
Studying	Self-contentment, Prepareing for an examination	space, time
Toilet hygiene	Physiological phenomenon	object, space
Calling	Health, Communications, Passing information	object, others
Communications	Communications, Friendship, Entertainment, Business	space, others, time
Health/Greeting	Friendship, Ceremony, Courtesy	object, others, time
Care	Hobbies, Duty, Love	others, object, time
Safety checks	Security, Protect of families,	object, space,
/Locking a door	Psychological stability, Going out	others, time
Bath/Shower	Cleanliness, Self-contentment, Break	space, object
Dressing	Cleanliness	object
Dressing up	Self-contentment, Entertaining guests, Going out	object, time
Personal hygiene	Cleanliness, Going out	space, object
Arrangement	Self-contentment, Cleanliness, Entertaining guests	space, object
Cleaning	Cleanliness, Entertaining guests	space, object
Washing the dishes	Cleanliness, Entertaining guests	space, object
Separate collection	Cleanliness, Protection of environment	space, object, time
Ironing	Neat, Going out, Self-contentment	object
Laundry	Cleanliness, Self-contentment	object, time
Preparing a meal	Entertaining guests, Self-contentment, Health care	others, object, time
Taking a meal	Basic needs, Self-contentment	others, time
Sleeping	Break, Basic needs	space, time
Resting	Break	space, time
Energy management	Economy	object, time
Financial planning	Economy, Housekeeping	object
Health care	Health maintenance	others, object

*others(including other family members)

Table 5: Intention- Behavior- Physical contexts

Intention	Representative Behavior	Physical contexts
Acquiring information	Computing, Reading books	space, object, others
Entertainment	Computing, Watching TV, Communications	space, object, time, others
Business	Computing, Communications	space, object, time
Break	Watching TV, Listening to music and radio, Bath/Shower, Sleeping, Resting	space, object, time
Leisure	Reading books, Listening to music and radio	object, time
Health	Exercising, Calling, Preparing a meal, Health care	space, object, others
Diet	Exercising	space, object, time
Fitness Management	Exercising	space, object, time
Self-contentment	Studying, Bath/Shower, Dressing up, Arrangement, Ironing, Laundry, Preparing a meal, Taking a meal	space, object, time
Prepare for an examination	Studying	space, object, time
Physiological phenomenon	Toilet hygiene	space, object
Communications	Calling, Communications	space, time, others
Passing information	Calling	object, others
Friendship	Communications, Greeting	space, others
Ceremony	Greeting	space, time, others
Courtesy	Greeting	space, time, others
Hobbies	Care	space, object, time
Duty	Care	space, object, time, others
Love	Care	space, object, time, others
Security	Safety checks, Locking a door	space, object, time
Protect of families	Safety checks, Locking a door	space, object, others
Psychological stability	Safety checks, Locking a door	space, object, time, others
Going out	Safety checks, Locking a door, Dressing up, Personal hygiene, Ironing	space, object, time, others
Cleanliness	Bath/Shower, Dressing, Personal hygiene, Arrangement, Cleaning, Washing the dishes, Separate collection, Laundry,	space, object, others
Entertaining guests	Dressing up, Arrangement, Cleaning, Washing the dishes, Preparing a meal	space, object, time
Protection of environment	Separate collection	space, object
Neat	Ironing	object
Basic needs	Taking a meal, Sleep	space, object, time
Economy	Energy management, Financial planning	space, object
Housekeeping	Financial planning	space, object

We determined not only the relationships between contexts and behaviors but also the following through an analysis of intentions:

First, there were many actions caused by the same intention through other behaviors. For example, the intention of ‘inviting guests’ is connected with various behaviors including cleaning and preparing a meal.

Second, there are some differences in physical context affected according to the intentions of a kind of behavior. A meal with a guest, for instance, is most affected by space and person.

Third, there are common characteristics found in looking at those intentions and actions depending upon the physical context. There are many behaviors in which a person usually uses those instruments much affected by the object. There are many behaviors impossible in the space. There are many behaviors connected with the external environment, like freshness, humidity, or the visit of another person, in those affected by time.

Finally, there are many behaviors connected with family in those greatly affected by others. This shows that users interacting among themselves is more important than any other elements, because it is connected with most behaviors.

5. Development of the Framework

5.1. Conceptual Definition of the Framework

The term 'framework' has been used in various fields. Thus, this study had a need to be sure of the meaning of its framework. It is this: visualized pieces showing dynamic movement. This can approach the fundamental user intentions from a wide point of view, not merely focusing on partial needs. The reason for developing a framework in this study is its capacity for deducing needs faster and more precisely (fig. 4).

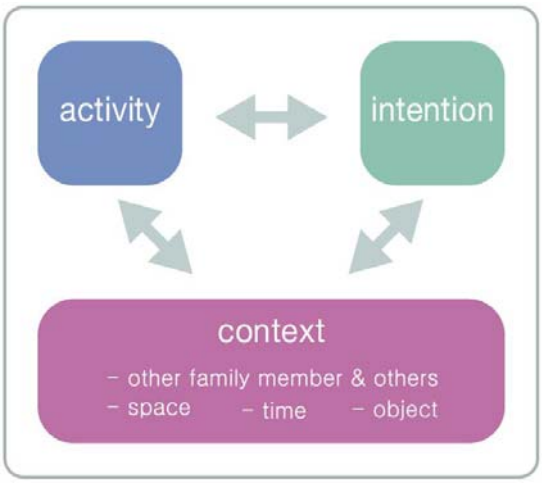

Fig. 4: Conceptual definition of framework

5.2. Visualization of the Framework

In the study, we visualize the framework according to main intentions. In the visualized context web, each in context, intention, and activity are correlated and they can be explained focusing on the following (fig. 5):

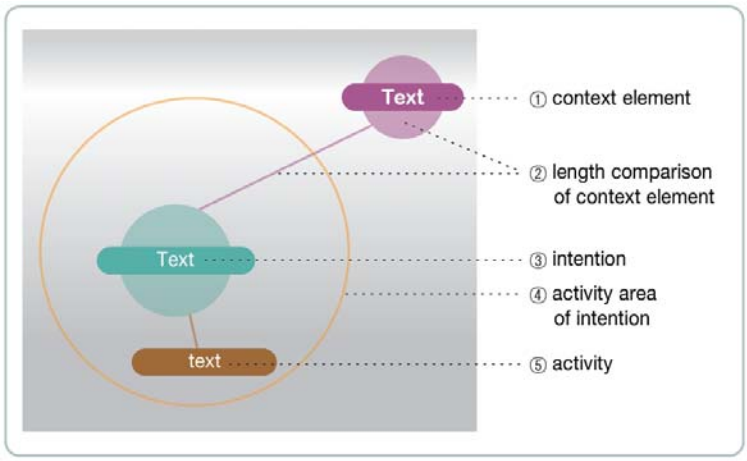

Fig. 5: Unit of Context Framework

①There are four elements of physical context, including family members and others, space, time, and object. The context is located out of the activity area of intention. ②The circle surrounding the elements of context expresses a relative range. The length of the contextual elements shows their relationship with intention. The shorter the length, the more it affects the intention. ③There are four events in this study observed by intention. ④The user context is located in the center as the activity area by intention. ⑤The context is located in the circle with a yellow line as activity by intention.

Among the various intentions, we have created four: inviting guests, holding family councils, getting ready to go out, and caring for a baby.

The representative behaviors of inviting guests are cleaning, preparing a meal, dressing up, greeting guests, partaking of the meal, conversation, entertainment and so on. In accordance with these behaviors, there is interaction between family members and the others they have invited. That is, there would be interations between ‘Who-Who’, and users and time could be understood as physical contexts. As we have to consider that all behaviors should be completed according to time and what kind of guests will visit and how they will act, we place less weight on space and time. This is displayed in fig. 6.

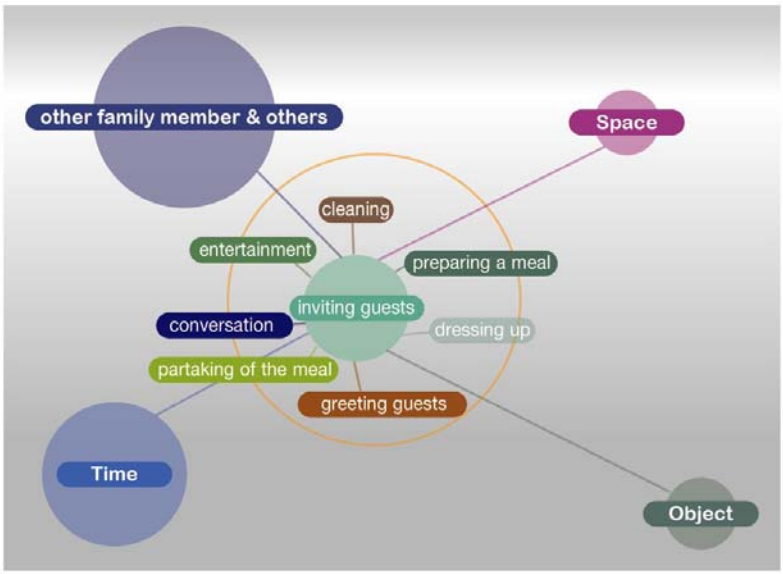

Fig. 6: Context web of inviting guests

There are cleaning, dressing up, checking, and security as typical behaviors of getting ready to go out. The preparations for going out in this situation are conducted by one person. This behavior results from interaction between 'Who-What' and time and object appear as key contexts. This is because such behaviors as inspecting the gas valve and securing the door are generated according to time before dressing up for going out and going out itself. This makes for relatively reduced proportions occupied by users and space. Its result is shown in fig. 7.

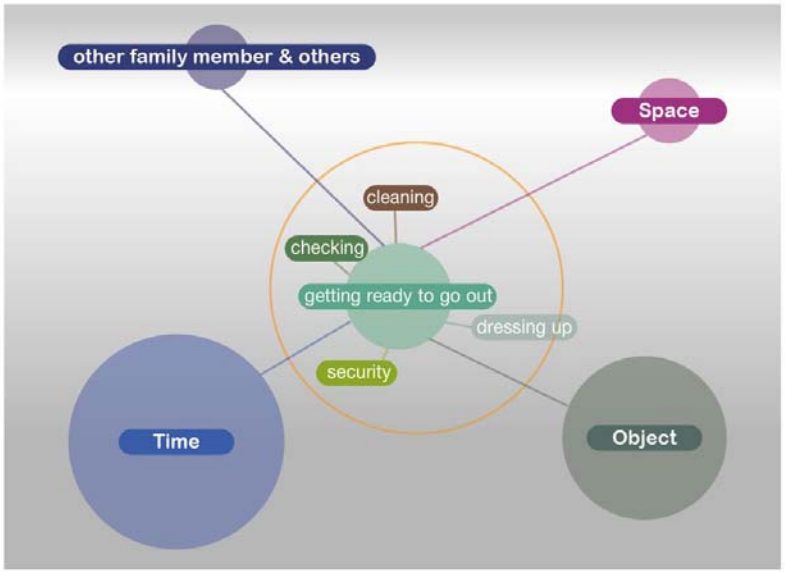

Fig. 7: Context web of getting ready to go out

As typical behaviors of holding a family council, there would be calling, preparing a meal, partaking of the meal, conversation, entertainment, and financial planning. This action makes family members and individuals interact with one another and one can see users and space as physical contexts. Because there would be more actions carried out in a shared space such as a living room rather than in individual rooms, we place more weight on users and space. This is seen in fig. 8.

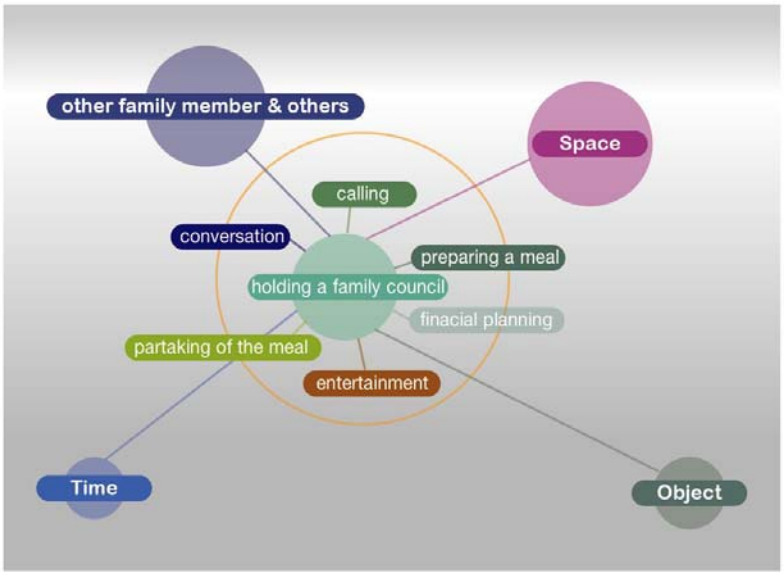

Fig. 8: Context web of holding a family council

The most behaviors of take care of baby are cleanlig, health, education, food, toilet hygiene and these behaviors are happened by interactions between individual and individual(Who-Who), between individual and object(Who-What). Physical contexts are user, object and time. Every behavior are closely related to babies just not individual from serving babies with food, keeping them health to giving them an education by looking after babies This appears like Fig 9.

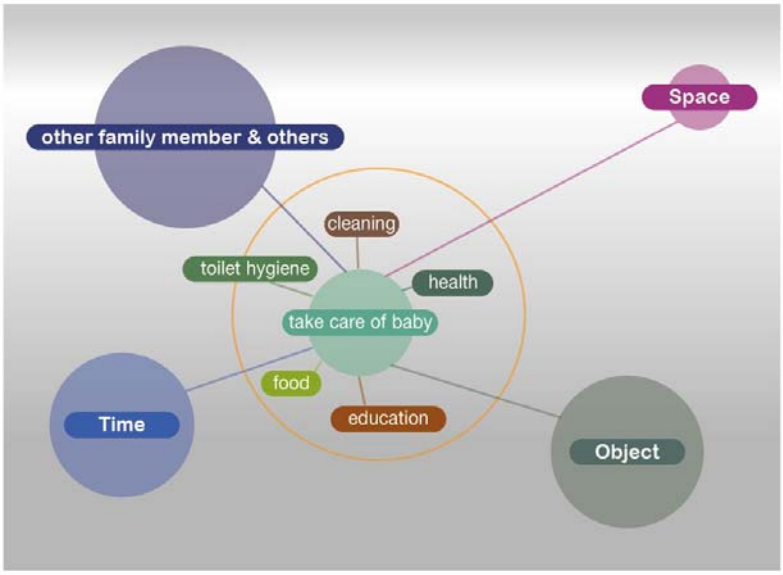

Fig. 9: Context web of take care of baby

From the context web, we find that the picture of the context is different depending upon the user's intention and the relationship between the elements of the context. The visualized context analysis of this study suggests it can be applied to design a smart home system in the future that reveals the dynamic and occasional relationships between user intentions, behaviors, and other contextual elements.

6. Conclusion and Future Study

6.1. Conclusion

A smart home is a life space guaranteed safe and convenient for family members providing the various functions users need without restriction of place and time. In this study, a visualized framework was developed after analyzing the context by making the centerpoint the intentions and behaviors of the users.

The framework developed from this study could be evaluated as follows:

A framework centering around user context was developed from materialized elements and visualized. This makes it easy to understand the relationships between elements by showing complex interactions between users and application services through simple visualization. It renders the visualized materials different from those of other studies by realizing the Internet as another aspect for the context of classifying behavior patterns. It will be often used because it is observed through a new point of view, understanding the context through analyzing and appreciating the intentions and behaviors of users.

6.2. Future Study

Studies for smart home design are advancing in all aspects; however, at present studies of users are relatively lacking. Therefore, this study holds the behavior patterns of users and context in accordance with user intentions, developed through a visualized framework. Therefore such studies as the following should be conducted based upon this study:

First, the study should be made more concrete by a more regulated framework because the framework developed herein was visualized as one that uses a relative rate.

Second, determination and analysis of the various intentions of users, except analysis of the four kinds of intentions listed herein, should be undertaken.

Third, an experiment method for verifying the framework should be put into place.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Everyday Imagination, Practices, Systems

Designing with people for systemic change

Daniela Sangiorgi[1], Hemment Drew[2], Monika Büscher[3]

Abstract

In this paper we bring together three different perspectives on collaborative innovation: service design, ethnographically informed innovation, and participatory art practice. All three afford important insights into the opportunities and challenges of 'changing the change' for a more sustainable future. We focus on the dynamic and complex, 'systemic' nature of change and – against the backdrop of our individual practical experiences – explore how we might design on such shifting ground. In this process, we all seek to harness everyday creativity and DIY solutions to design *with* as well as *for* people. Folding this ongoing concern from our individual work into a recently begun collaboration has leveraged powerful synergies for collaborative innovation for more sustainable living and we discuss a planned project.

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1. Introduction

Designing for a sustainable future poses many challenges. There is, on the one hand, a need to be bold; to imagine and 'design' new systems that enable more sustainable lifestyles. On the other, sustainability depends on unpredictable changes in people's daily life practices as well as on how they adapt to, and adopt, new system possibilities (Halpern *et al.* 2004).

Control may seem possible through education, incentives, coercion, (social) engineering and design, but historical studies of systemic change (e.g. Mosley 2001 on air pollution, Worpole 2000 on architecture) show that while these approaches may play a valuable part, if education, engineering, policy or design are 'done *to* people, not *with* them' (Worpole 2000, 68), they fail.

Yet endeavours to design with people face a catch 22. The emergence of new practices happens as part of doing things differently. To enable and study the everyday imagination that underpins this emergence and to fold it into design requires realistic appropriation of (prototype versions of) the system that is being 'designed' (Büscher 2005). A critical mass of technologies, policies, services, infrastructures, etc. must be implemented, not just as scenarios but in some way 'for real', e.g. through experimental implementation of prototypes. This makes for a costly iterative design process that has to fight to resist the momentum of investment in particular ideas. The challenge is to remain able to radically revise ideas – intellectually, creatively, and practically.

In our recently begun collaboration we bring together methodologies from service design, ethnographically informed participatory socio-technical innovation and participatory art practice. We argue that our methodologies can be fruitfully combined to draw people into 'designing' systems and 'change the change'. We aim to leverage the fact that people are already inventing DIY sustainable solutions (Meroni 2007; Willis *et al.* 2007), and to study, encourage and design for emergent future practices.

In this paper we describe how the synergy between these different methods can overcome individual limitations and amplify the benefits of each, while improving the ability to design for sustainable futures. We present and compare experiences that applied the singular methodologies, as well as a planned collaborative research project that brings them together in an experimental way.

2. Post-disciplinary collaborations

When Buchanan (1994) talks about 'third order' and 'fourth order' design, he refers to the recent need for design to move where strategic decisions are made in order to be in a position to influence future directions. This means moving from designing single objects (products and graphics) to design action/processes (like services) and systems; moving from end of chain contributions toward upward positions and roles within society.

The complexity of contemporary challenges (climate change, poverty, rising and ageing populations, chronic disease, epidemics, security crises etc.) need a wider perspective and the introduction of aware design decisions and approaches at levels where there is real possibility to influence choices; as Thackara says "many of the troubling situations in our world are the result of design decisions" and "if we can design our way into difficulty, we can design our way out" (2005, 1). This requires a shift from narrowly conceived development to 'design mindfulness' for dynamic complexity: "design responsibility means that designers should be conscious of the fact that, each time they engage themselves in a design project, they somehow recreate the world" (Findeli 2001, 14).

While *scaling up* design is also *reaching out*, meaning that when both the complexity of challenges and the objects of design become bigger, design needs to collaborate with a wider

number of stakeholders and professions. This requires designers to *bring in* design resources and tools to enable 'strategic conversations' among key stakeholders, experts, and creative visionaries (Manzini *et al.* 2004) to co-design future solutions, but at the same time they must also *bring out and develop* creative everyday imagination resources and skills in those who are part of co-designed solutions, so that they can 'change the change' from within and work and live differently.

The role and practice of Design is therefore changing in response to, and in anticipation of, complex demands of contemporary life. In this paper we suggest that there is a need to explore and support this development and to make it more effective in "changing the change".

Instead of a designer centred approach, we are moving toward a 'creativity' and 'design thinking' oriented one that focuses on how can we leverage and align both professional and everyday creative resources and skills to move toward more sustainable forms of life and economic exchange. This trend has begun to foster 'multi-disciplinarity' in research, education and business as a way forward (Cox 2005): multidisciplinary courses of education are recommended as a way to ensure that specialists will have a broader understanding of creativity and of other specialisms and will be able to better collaborate in the future.

With regard to everyday imagination, creativity is increasingly understood as a basic skill inherent in all human activities and people already use this resource in their daily life to improve their life conditions (Meroni 2007). Designers are therefore moving toward working with people to leverage these existing resources and connect them to wider systems and strategies (Thackara 2007; Manzini *et al.* 2003; Burns *et al.* 2006).

In this paper we would like to develop these considerations, because we believe that in order to expand designers' role and influence into contemporary society multidisciplinarity and an appreciation of everyday imagination are not enough. Disciplines carve up the world and, by studying different areas (the economy, society, ecology, etc.) from different perspectives, they separate what needs to be understood as a whole. Multi-disciplinarity, at best allows a mutually informing overlap of perspectives. At worst, it gives rise to competing accounts of reality, undermining rather than enabling collaboration. While multi-disciplinarity can facilitate important insights into the dynamic complexities of systems, it does not enable an understanding of systems' lived autopoesis. We believe that what is required is a post-disciplinary approach. Post-disciplinarity (Sayer 2001) fosters study and intervention as a holistic endeavour. Post-disciplinarity supports groups of people (with a range of expertise and skills) to address complex problems and opportunities. It enables analysis and design to follow connections all the way through and to forge viable new connections, because they are more mindful of the multitude of dependencies. It does not need to lead into eclecticism or, even worse, dilettantism. Post-disciplinary research and design crucially requires collaboration between diverse actors: we do not expect that individuals could or should be able to understand and 'design' systems as individuals. It is important that individuals have grounding in disciplinary and practical everyday skills and knowledge, and that they are able to open up and become mindful to previously unkown or unnoticed phenomena. Post-disciplinary researchers and designers must step outside their box and become mindful of other disciplines' knowledge and skills to a very high degree, enabling them to work closely with experts from that discipline, or experts from particular walks of everyday life. This requires listening, learning, visualizing, arguing, experimenting. Working like this goes beyond collaboration with clearly demarcated responsibilities and knowledges. It allows for sophisticated interferences and synergies that allow groups of people to grasp complex problems more firmly, at multiple points simultaneously, and in ways that are mindful of connections and interdependencies than they could otherwise. What makes this post-disciplinary is that while people maintain their roots in their own discipline, they acquire the skills to 'seriously' work *with* others, not just alongside others.

In this paper we discuss the potential of this convergence for the design of sustainable futures. We will do this by exploring the combination of three experiences and approaches to post-disciplinary design _ service design, ethnographically informed socio-technical innovation

and participatory art practice _ to explore future sustainable scenarios in collaboration with people and potential users.

3. Service solutions, future laboratories and strange connectors

In this section we describe our individual experiences in design. These are not mainly in designing for sustainability, which makes it clear that other challenges/opportunities are also multi-dimensional and dynamic and that good design as well as effective appropriation are fostered by post-disciplinary approaches. In this section, we explore how our experience can be transposed into design for sustainability and to 'change the change'.

We argue that our methodologies (see fig. 1) can be fruitfully combined to draw people in and 'change the change'. We aim to leverage the fact people are already inventing DIY sustainable solutions (Meroni 2007; Willis *et al.* 2007), and to study, encourage and design for such (and further) emergent future practices, by combining three different experiences and approaches.

3.1 Service design

Service designers observe, analyse and interpret markets, current social and technological trends and users' behaviours to identify areas of opportunities for the development of new service solutions for the future. Areas of opportunity are elaborated into overall scenarios that delimit and visualise possible futures. Single service solutions are therefore designed starting from these wider scenarios, as possible manifestations of these platforms. Service solutions are designed in terms of their offering (what the user will be able to do), experiences (how the user will experience the service) and system (who is the supplier and how it is organised). Visualisations like storyboards, videos, maps and moodboards are developed to communicate the service scenarios and ideas back to users and suppliers during an iterative design process.

An example of Service Design applied to developing future sustainable solutions has been the research project[4] developed for the multinational Qfree, the European leading supplier of Electronic Tolling Collection systems. The aim of the research project was to conceive new multimodal mobility services for the Italian market where charging and traceability systems could be profitably used to improve urban and social well-being.

The Electronic Toll Collection (ETC) technology, currently used to collect tolls from the urban mobilities, is based on Onboard Units endowed with a Smart Card. The Smart Card can communicate via microwaves with specific points of transit and is currently adopted for motorway and urban user charging, where vehicles are tolled without the need to pass through specific toll plazas, or reduce their speed. The research project aimed to move from this simple tolling logic, detached from the mobility system and not providing alternatives to users, to a service oriented logic; to use ETC technology as a platform to improve the efficiency of and to integrate the mobility and service system, on one hand, and on the other hand to enable more sustainable behaviours.

The research team has worked on three main interrelated levels - context, technology and users - and have moved backward and forward from analysis to design within real contexts to the visualisation and design of abstract scenarios.

[4] The project "Intelligent Mobility System Sector Scenarios" was developed from January to May 2007 by a research team from INDACO Department of Politecnico di Milano.

As the Smart Card can be used also as personal card to access various services (public transportation, private cars and services), ETC technology can allow the management of *mobility credits*, where the user can buy, spend and gain credits according to his/her behaviour, in the light of a multimodal mobility scenario. The adoption of such a perspective (practically encouraging and rewarding positive behaviours instead of only punishing the wrong ones) allowed the team to shed a new light on the mobility services that invoke the positive psychology approach (Csikszentmihalyi 1991; Seligman 2002).

Based on this overall scenario the research project has developed 6 *service solutions* for 6 *metacontexts*, that is to say, typologies of emblematic Italian urban or extra-urban settlements with recurring mobility features:

1) the metropolis, Milan: Providing multimodal possibilities to integrate public and private transportation;
2) the hinterland with a trade fair pole, Rho-Fiera: Access to organized mobility and fair services for exhibitors;
3) the historic/productive town, Como: Multi modal mobility system based on the use of green vehicles to access an historic city downtown;
4) the skiing area, Alta Badia: Skiing services integration through the ETC system and built-in additional technologies;
5) the inhabited natural park, Parco Nazionale delle 5 terre transformed into an harbour scenario, where the system is adopted in the marine sector;
6) the Motorway system: Introduction of the ETC system in the motorway adopting a mobility credits model.

3.2 *Ethnographically informed socio-technical co-realization*

Amongst many other methods, a design orientation towards ethnographically informed 'co-realization' (Hartswood *et al.* 2002) comprises two experimental approaches to achieving far future oriented change: 'future laboratories' and 'bricolage'. Future laboratories either bring the real world into the laboratory or take the laboratory into the field. Placing an emphasis on realism, collaboration and experimentation, future laboratories assemble components of the future (e.g. functional prototypes of technologies) and enable people to colonize new socio-technical futures. This encourages people to bring everyday imagination into the process and to explore and shape new practices not only discursively, but also through embodied appropriation and real time habitation in (partial) futures. 'Bricolage' goes further, seeking to fold future technologies productively into real world work (Büscher et al. 2007 and 2008).

As an example, we have designed and experimentally implemented pervasive technologies (embedded, ambient, and mobile computing technologies) to support improvisation and collaboration amongst emergency response personnel, using 'future laboratories' in the emergency training ground at the Aarhus Brandskolen, and through 'bricolaging' prototype technologies into real world work at the Tall Ships' Races in Aarhus in July 2007, where prototypes were used as part of the event management in the command centre. This concrete practical experience enabled the application of everyday creativity – connecting design of technologies with the 'design' of future practices. It makes it possible for designers and users to 'colonize' rather than just visualize the future.

Pervasive technologies have the potential to support professionals in their effort to collaboratively produce and update their assessment of the situation. This was the premise of our participatory design collaboration. Between 2003 and 2007 we have developed prototype technologies to support professionals, especially police, fire brigade, pre-hospital, and ambulance personnel. This culminated in a prototype of a fully functional 'assembly' of technologies during Tall Ships' Races 2007 implemented in and around the command station at Aarhus harbour.

3.3 *Art: Strange connectors*

Art offers a set of resources for envisioning social and technological change in a way that is inherently participatory, and for opening up disruptive spaces of play. It escapes the bounds of realism, not through flights of fancy, but through critical imagination and rupture. Such creative practice 'hacks' into different social, professional, technological and institutional situations, often acting as an intermediary or 'strange connector,' linking things in unexpected ways, or linking things one would not expect to be linked. The method involves a process of creative exploratory work involving artists within an interdisciplinary group, with the researcher often in the role of curator, working to 'create context' and to originate new artistic work with the artists that addresses the research questions. Integral to this method is the active involvement of audiences through the public presentation or iterative development of artworks. This method involves working abreast of practices that are contemporary, new and continually evolving, and drawing from them a process or a new way of looking at things.

'Social Networking Unplugged' is an example that focuses on social networking or 'Web 2.0' technologies (flickr, twitter, myspace, etc.). It was a curatorial project on social networking that involved people across Manchester in large-scale art installations and events. It was the first major art exhibition to present a comprehensive and creative look at social networking featuring twenty artworks, each one taking a sideways glance at online social networking and virtual worlds. Here artists have been invited to create offline equivalents of social networking websites such as FaceBook and MySpace so that comparison can be made with the way people socially interact in different scenarios when online and offline. The artworks 'unplugged' these new social spaces in order to take them apart, see how they work, and put them together in new ways. The experiment aimed to advance understanding of online relationship building and social networks, and also to explore how the requirements for social networking tools vary when sat behind a desk at a computer and when roaming through the city. Many of these projects are provocative and challenging. One example was the Rubbing Shoulders project which created an offline equivalent of the 'digital handshake' involving physical touch. This was already transgressive and involved risk. This was increased when a UK Government report highlighting the dangers of social networking to children was published shortly before the exhibition, resulting in front page news stories equating social networking to paedophilia. This provided an opportunity to address challenging issues and the project was adjusted and a version delivered at a local school to explore an ancillary range of research questions, while also serving to intervene into public discussions on the subject.

4. Designing with people for systemic change

These three projects represent different ways of working towards or 'designing' possible futures, to explore opportunities and new technologies with users and companies.

We argue that the synergy between these different methods overcomes individual limitations and amplifies the benefits of each. For example, co-realization depends on realism and is, therefore, costly. It can suffer from path-dependency, where investments made into one solution influence the allocation of future design efforts. Moreover, while these approaches score high on 'designing *with* people', it can be difficult to shape bold visions when immersed in the detail of everyday practice. These limitations can be overcome by introducing methods from service design and art. Design of service scenarios, for example, provides 'systemic' visions of future solutions based on existing needs and trends. It, in turn, benefits from combination with more experimental methods through being able to ground visions more clearly in emergent practices. Art transcends the confines of future visions through critical reflection on the tensions between the kinds of futures we actually want and those we may be creating, and enabling people to colonize these futures experimentally, playfully, critically. At the same time Art is often based on a one off event that provokes critical reflection and engages the public, but lacks in

terms of capacity to collect, interpret and develop a critical mass of ideas, experiences and motivations into solutions that can contribute to ‘changing the change’.

As part of our current collaboration we are exploring how to converge these practices in the design of a new project that will take place in the Futuresonic festival in May 2009 as part of an exhibition titled *Through Cracks In The Pavement*. Accepting the hypothesis that human actions are affecting climate change, the proposal is to create precedents for social change through creative, participatory interventions involving artists and experts in the environment, technology, and society. The focus is on urban environments - one type of environment where problems stem from, and where change needs to take place.

A new methodology will be experimentally employed on a range of projects exploring how to harness everyday creativity to enhance environmental sustainability in urban contexts. The objective is to *develop an art event into a platform for participatory service co-realization projects* that are transformational and involve people in making a meaningful difference to the sustainability of their lives.

It will present newly commissioned artworks and future scenarios that through *combined arts and design approaches* will seek to inspire social change and to enhance environmental sustainability. Featured artworks will be participatory, sited in public space, and in an urban context to experiment with technologies and possible future scenarios in an engaging and playful way, enabling ideas, changes and proposals to emerge and be visually recorded.

Ethnographic studies will document the events, reporting the detailed interactions of people with the artworks and scenarios feeding back the design of technologies and services; participatory and service design will provide the context and tools to enable people to experimentally intervene and change the proposed scenarios and express their perspectives through interaction and participation; as well as elaborate results into solutions and possible concrete interventions.

Urban Climate Camp, a workshop involving artists, communities, technologists and environmental experts, will use these experiments as material for discussion and further development of the emerged ideas.

Within the wider art event on climate change, an example of potential participatory service co-realisation projects, will be ‘A-mobs: Alternative mobilities for sustainability’. The purpose of this project is to ‘design’ alternative mobility systems, that is, to co-realize technologies, infrastructures, objects, and practices needed for more sustainable movement within and around Manchester as a typical post-industrial major city. This project will combine exploratory art installations that will work as both creative and participatory interventions (see social technologies unplugged example) and ‘service prototypes’; this to generate ‘strange connections’ that help questioning current mobility patterns and their effects on the environment as well as engaging users to experiment, evaluate and modify proposed service scenarios through ethnographically informed co-realisation processes and tools. The documentation and output of these projects will be elaborated into detailed service scenarios to inform Private and Public sector organisations, that will participate, with the public, as partners, users and co-creators of the alternative mobility system.

This sketched approach draws a direction to improve the effectiveness of designing futures that need to be experimented in field, to evaluate synergies while converging the single methodologies.

5. Changing design for Change

As Alain Findeli reminds (2001) Design have been alternatively associated with Arts, Technology and Science as main sources for education curricula. Design has traditionally been part of ‘applied arts’ tradition, moving then, with the emergence of the new industrial paradigm, to

a more scientific driven approach (applied science) as promoted by the Hochschule für Gestaltung at Ulm.

The radical changes in the context where Design operates today as well as the inadequacy of the mechanistic model of the traditional design process (from problem identification to solution), ask for a new convergence and a new sensitivity (and maybe for a new vocabulary as well).

In this paper we have explored the potential benefits of converging Design, Arts and Ethnography to improve the way to understand and act within complex systems in order to orient them toward more sustainable futures. We do this acknowledging how Design, Arts and Ethnography are actually already converging in their recent evolutions, moving toward more interventionist and participatory approaches.

Art practice is changing, with many contemporary artists (including those working outside an academic context) adopting participatory and process-based ways of working which are convergent with developments in social-science and other academic research methodologies. The methodology outlined above draws on socially and politically engaged art practices within Media Art, notably 'tactical media,' a critical art practice which departs from Modernist understandings of artistic autonomy and seeks to intervene within specific social and technological processes. And fields such as locative art involve artists in experimentation, which is social and technological as well as aesthetic (Hemment 2006).

Social observation, too, has changed. The most relevant innovations relevant to design have been a move away from ‘scientistic’, quantitative research and theoretical abstractions towards more philosophical, ethnographic, ‘grammatical’ investigations (Garfinkel 1967; Suchman 2007). Human behaviour is increasingly recognized not as governed by rules and social and material structures, but as performative. People create social and material orders as they live their lives, interact with others, and with their environments. They simultaneously create and orient to social and material rules and structures. Based on more than two decades of collaboration between designers, practitioners and social scientists who study the performance of everyday order, post-disciplinary assemblages of expertise and skill have emerged in socio-technical innovation, computer-supported collaborative work, and participatory design. As design is ‘no longer the exclusive province of professional practitioners’ and design practitioners recognise the complex dynamics of shaping and re-making whole systems, social science can not only help think through the possibilities of redrawing complex connections but also help to co-realize them (Suchman 2007). Moreover, social science can accompany design with studies of emergent future practices (Büscher 2005). Future Laboratories and bricolage techniques are examples of methods that create possible futures to explore *what might be* and evaluate how the design visions are interpreted and inhabited by users in realistic contexts.

These already existing convergences can be therefore amplified to strengthen the potential of each to use creative and participatory methods and tools to imagine, explore, questioning and experimenting with people possible futures.

This paper is a first platform for us to evaluate and explore these synergies; the coming projects will enable us to implement and evaluate this research direction toward post-disciplinarity as a way to contribute to the “changing the change’ movement.

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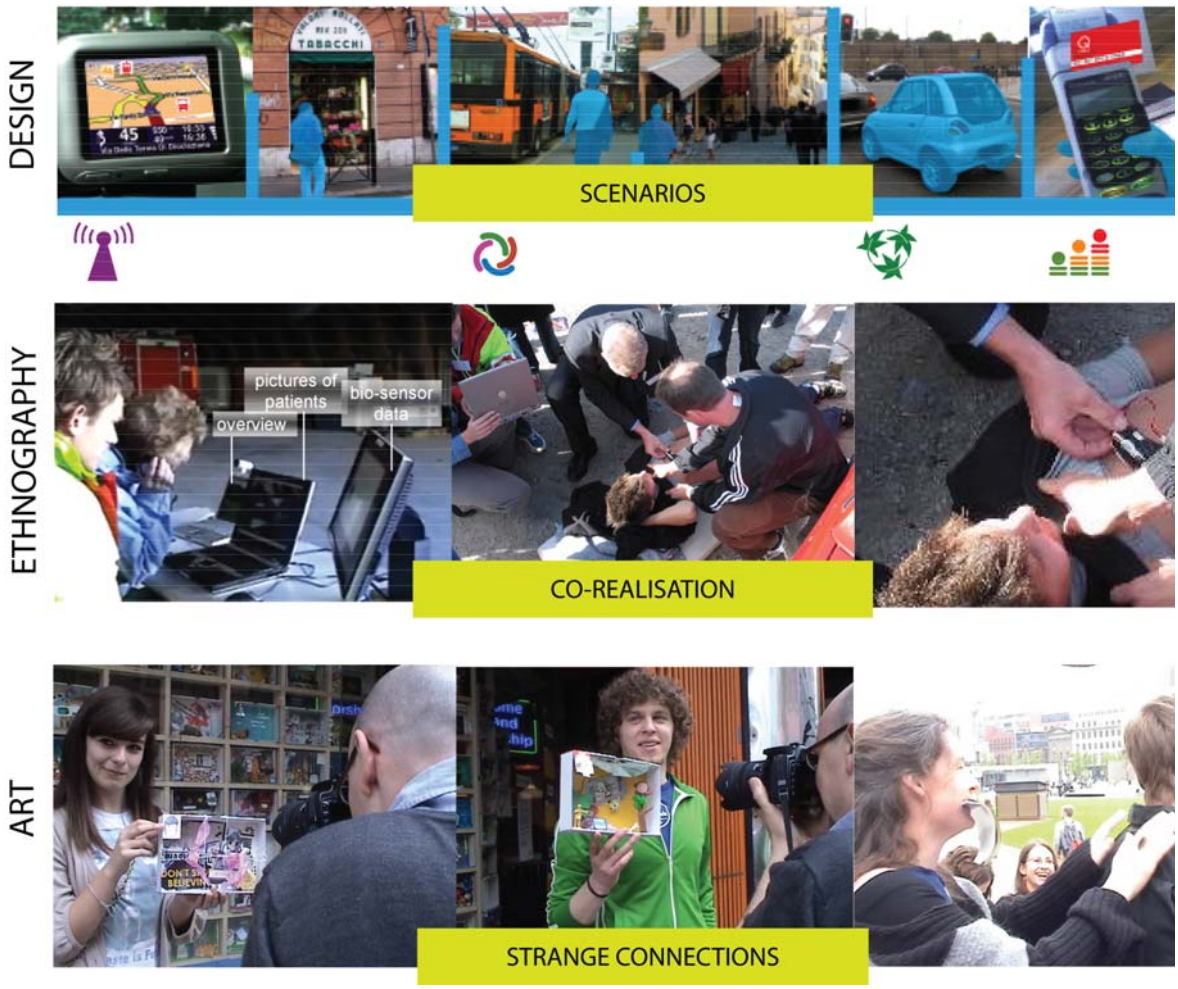

Fig. 1: Images representing the three methodologies from Design, Ethnography and Art: a) storyboard representing one of the six mobility solutions; b) a vision of the future of emergency response teamwork; c) images from the 'Social Technologies Unplugged' event

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Embedding sustainability on do-it-yourself products aiming at low-income families

A Case Study on Shelves Used to Divide Living Spaces

Santos, Aguinaldo dos[1], Lepre, Priscilla Ramalho[2], Rollof, Dörte[3]

Abstract

Around 85% of the products present on low-income houses in Brazil, including the house itself, have a direct involvement of the user him/herself or the surrounding community on the assembling or maintenance process. However, there are little examples of products in the country that were actually designed for this reality. In this way, this study has investigated the use of a Do-It-Yourself (DIY) approach as a means to introduce sustainable principles, with a focus on both the environmental and social dimension. DIY products are those in which users they can be involved on designing, producing, maintaining and even recycling a given product. The reduced amount of bibliography about this theme reflects the broader neglect of the research community on this field of activity, despite its scale as a social phenomenon. On this research project we have developed a case study with the aim of designing shelves that could also be used to divide living spaces.

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1 Introduction

Do-It-Yourself (DIY) products are those in which users themselves can be involved on designing, producing, maintaining and even recycling a given product. Campbell (2005) proposes the use of the term “craft consumer” as a more precise definition for DIY. Craft consumption explicitly entails production of a product made and designed by consumer him/herself, involving the application of competences and passion in order to creatively transform raw material and components into an actual product (CAMPBELL, 2005; WATSON & SHOVE, 2007). To Watson & Shove (2007) and Mintel (2005) DIY can simultaneously figure as leisure and work, and as consumption (of materials and tools) and production (of changes to the home). Edwards (2006) argues that nowadays DIY is handwork but not craft and is done in leisure time but is often not a hobby.

A more restricted variation of the DIY concept is the Ready-to-Assemble (RTA) product where the focus is solely on the final assembly. RTA furniture, for instance, include products such as entertainment centers, electronic and computer furniture, storage units, cabinets, desks, and dressers. RTA furniture has flexible designs that allow multiple pieces to be made from basic configurations. A simple bookcase can be transformed into a chest of drawers, a closed cabinet and an entertainment center by adding the appropriate drawers, doors, shelves, and hardware (VLOSKY, POKU & WILLE, 2007). .

In developed countries the market of do-it-yourself (DIY) products is already well structured and consolidated. One of the reasons pointed for such situation is the high cost of manual labour and also cultural issues. In countries like the US, England and Germany, there is an widespread habit of people engaging on renovating their own places or assembling sub-systems.

In Brazil this engagement by users in assembling sub-systems and products is also disseminated, however for quite different reasons. There are even government programs that focus on the involvement of the low income family on the actual construction of their houses. As a matter of fact, building in Brazil, is majorly ‘build-it-yourself’, which means that the own resident is engaged in building the home or managing the construction process. Cuperus & Napolitano (2005) argues that such activities could also be considered as “decide-it-yourself” activities. Here, according to this authors, work has been removed from the traditional manufacturer/builder towards consumer driven trades.

However this ‘do-it-yourself’ practice in Brazil happens without components and sub-system being designed for such approach, resulting in hazardous situations, high environmental damage and poor results on the habitat. It oftens ignored issues such as product ergonomics, information design, sustainability, modular design, maintenance, upgradability and other key-aspects in product design. The situation is critical since competence on DIY is distributed both between the human DIYer and the tools and materials themselves with which he/she engage to undertake DIY production. Painting a panel door, using the example provided by Watson & Shove (2007), used to require that the painter knew the appropriate order in which to paint it and how to apply the paint without drags or drips. Meanwhile a fast drying non drip water based paints ‘know’ how to go on to a door with an acceptable finish, not requiring any special skills from a painter.

DIY can clearly contribute to provide better quality of life to low income families in Third World countries such as Brazil. The reduction of resources used in production by the manufacturer is the most obvious source of cost reduction but other areas such as distribution can also achieve better cost performance. However, little is known regarding the requirements of a DIY for a Third World environment. In this context the present paper reports a research project that investigated the requirements for do-it-yourself furniture within low-income houses in Brazil, with a focus on furniture that can be used to divide living spaces.

During previous studies the research team has identified that in most low-income houses in Curitiba the family often uses a wardrobe to provide a visual separation between living room and

the main bedroom. Such situation often resulted on poor living conditions both from the aesthetic and functional point of view as well from the point of view of thermal and acoustic insulation. The research team intended to contribute to solve the problem under the economical constraints of these families and, at the same time, to adopt the main guidelines proposed by Manzini & Vezzoli (2002) regarding the sustainability of the product. Also, in order to enable full flexibility to the user regarding the position of the "furniture/partition wall" the product had to be able to be assembled by the user him/herself.

2 Historical Context

DIY could be traced back to the pre-history of mankind since it was the only way to obtain a desired product. Edwards (2006) argues that prehistory provided an opportunity to investigate the reasons why people want to "do-it-themselves" (EDWARDS, 2006). Edwards (2006) analyses this issue on the more recent history of mankind through the continuities between modern DIY and the crafts pursued by women in the eighteenth and nineteenth centuries. Eighteenth century creative work was about self-expression through craft work. Gebler's (1997) has identified such craft motivation on his historical analysis that pointed the arts and crafts movement of the late 19th century as one of the main influences on redefining DIY. At that time aspects of DIY such as ingenuity, enterprise and self-reliance, were common among female homemakers using their own craft and design skills.

Women's domestic arts and crafts reflected a process of design democratization through self-expression. By the end of the nineteenth century women were still defined by their ability to create crafts for the Home. The change in the roles and status of, and attitudes towards women from the early to the mid-twentieth century has allowed a shift on the gender paradigm. However, there are still many who still distinguish between soft (decorative) DIY and hard (structural) DIY with its gendered stereotypes (EDWARDS, 2006). Similarly Gebler (1997) has identified a the relation of DIY and the masculine domesticity in the US through early to mid 20th century. He highlights the role of DIY as a an increasing cultural requirement for men to play an active role in the home from the end of the 19th century.

Elements of personal "handicraft" often are mentioned alongside the concept of DIY. Edwards (2006) cited that in an early DIY text from the 1950s this proximity of craft with DIY was expressly stated: "Do-It-Yourself is an expression of the ingenuity, enterprise and self reliance of the individual, and in an age of automation it is good that fundamental arts and crafts are not being lost '.

Nowadays Watson & Shove (2007) argues that DIY moved from a largely unwanted responsibility of householders to a desirable pass-time for a man/woman, enabling release from alienated paid work through being a part-time craft activity. Nowadays modern DIY appears to reflect aspects of self-expression together with the turning of alienated products into artefacts with personal associations; of leisure pursuits and the desire to be creative, and the need for economy (EDWARDS, 2007).

The reduced amount of bibliography about this theme reflects the broader neglect of the research community on this field of activity, despite its scale as a social phenomenon. The result, according to Watson & Shove (2007) is an under-theorization of the complex phenomenon through which objects shape and are shaped by everyday life.

3 Motivations and Challenges for DIY

There are a number of challenges that DIY products face in order to have success from a sustainability point view, particularly on the Third World:

- short learning curve leading to potential quality problems: competence and confidence is developed among DIYers by pushing back boundaries based on active synthesis of existing experience and knowledge through practical engagement with the DIY activity (WATSON & SHOVE, 2007). However, repeating the same assembling procedure within

a manufacturing environment presents benefits that cannot be replicated on a normal DIY setting. Thus, DIY can result on products with poor quality and on an unsafe assembling process. There is a need of staff at stores that are able to help consumer to understand the DIY product and its associated process. Information boards and free “how to” leaflets with are also useful practices to enable customer learning on DIY. However, most DIY products have multiple ways to assemble and use, thus making impractical to display all possibilities both graphically and physically;

- Resistance from conventional trades: DIY can be seen simply as a process of deskilling and, thus, it can receive strong resistance by professionals and companies that continue to provide products on conventional ways. Watson & Shove (2007) argues that rather than facing DIY simply as deskilling it should be understood as a “redistribution of competences” enabling a wider range of people to take on the task of painting a door;
- Supply-chain constraints: Vloski, Poku and Wille (2007) have investigated the challenges for ready-to-assemble furniture manufactures and their findings included getting consistent raw materials, volatile pricing in the marketplace, overseas competition and local competition. Despite these barriers it is important to notice that in sector such as furniture recent advances in production machinery have enabled more intricate cuts which then have provided more freedom to designers of DIY products (VLOSKY, POKU & WILLE, 2007);
- Lack of proper tools with DIYers: whilst on developed countries there can be few households that do not have a set of basic tools such as hammers and screwdrivers, in developing countries that itself can be a barrier for DIY. Watson & Shove (2007) call attention to the fact that it is ultimately in the practice of DIY that lay the importance of usefulness or absence of a given tool;
- Perception of DIY as an inferior product: poor design and deficient DIY assembling process as resulted on an image of product with inferior quality. DIY/RTA furniture, for instance, once viewed as an inferior alternative to solid wood furniture today are quality products while still being offered at lower price. In order to be more competitive with pre-assembled furniture DIY/RTA furniture is adding real wood surfaces and other authentic looking finishes such as veneer, improved laminates, coatings, and other finishes to enhance quality and protect the surface against scratches (VLOSKY, POKU & WILLE, 2007).

Despite these barriers “lower cost” is clearly the main driver for people choosing DIY products and processes. However, it could also be pointed the ethics of self-sufficiency; the desire to demonstrate to him/herself capability; the pleasure that comes from solving practical problems; the recreational properties of physical labour; the satisfaction of competently use the right tool for the job, or a skill mastered, or a job done (WATSON & SHOVE, 2007). Current quality, easy assembly and increased options and styles are also important explanations for the phenomenon of DIY globally (VLOSKY, POKU & WILLE, 2007).

Pollakowski (1988) founded a strong correlation between household DIY and age and that renovations are most likely to be undertaken by a recent mover. Bogdon (1996) finds household composition a major determinant of the likelihood of a household taking on DIY, with multiple adult households most likely to undertake it, single parent families the least likely. Baker and Kaul (2002) and Clarke (2001) highlight the significant relationship of changes to household composition and financial situation with the likelihood of home remodeling. There is also the “no one can do a better job than me” syndrome among DIYers which also motivated by the wish to minimise engagement with tradespeople (WATSON & SHOVE, 2007).

Motivations for DIY can also be linked to postmodern consumption where the consumer is also a manipulator of symbolic resources afforded by commodities, under which DIY can be a means to realising effects which convey individuality and self-identity (WOODWARD, 2003). That might even include media inspired aspirations.

4 Learning from the “Build-it-Yourself” practice

In Brazil there is a great lack of research regarding design and implementation of DIY products. Most of the research in this area deals with the strategies to obtain user engagement in the architectonic project or with the construction process with the support of construction experts (ABIKO, 1995). The participation of owners when designing their houses or even building it, is of great importance, because it makes them more commited with their house and their neighborhood, making them feel part of the community. Hence, a do-it-yourself product has a social impact since it can provide satisfaction and pride to the prospective resident of a low-income house, since the producdt is the result of his/her own labour (VIEIRA; MARCHETTI; DA SILVA, 1993)3.

Several writers have noticed that joint or group building and build-it-yourself bring out many technical and constructive aspect issues in the houses, many times not even reaching a standard quality level, which means a very rough living condition (LIMA, 1979; ROMERO,CRUZ e ORNSTEIN, 1995; TARSCHNER, 1998). Having that in mind, DIY products give opportunity to anticipate possible mistakes in assemblage through the use of poka-yoke systems (error proof devices), increasing chances to achieve the desired quality level.

One way users can engage in building their own house is called joint or group building. Joint-building is also known as mutual help building according to ABIKO (1995). This joint-building strategy is defined as a mutual effort driven by a community in order to build their own homes, being financially and technically supported by the government. Although they use low-tech assets and simple projects this all results in bonding between users and the product of their work, inducing a proper use and maintenance of their own houses (ABIKO,1995). There are two types of joint or group building according to ABIKO and CARDOSO (1993):

- Institutional management: a public agent manages the whole enterprise. That means making all projects, supplying the work with the technical team that will manage all financial and non-financial assets;
- Co-managing: the government supplies all assets to the community. The community then hires independent offices of technicians to assist them on how to manage those assets. These offices are also responsible for technical issues as technical managers and making projects;

According to ABIKO (1995), in the case of people building their own house the main strategies are:

- Supply of standard or personalized building plans: the Government or union may supply design as an incentive to improve building done by build-it-yourself, and also facilitating their control. A personalized design makes one choose the best way to implement it, taking into account land topography, insolation and ventilation at their home;
- Design and distribution of handbooks for building: these handbooks feature easy to understand language, step-by-step on how to build a home concerning design; best choice of material and equipment; details for an assisted building; gear and required tools, etc;
- Supply of technical advisors to an entire project: technical advising is formed by architects, technologists, designers and engineers who provide guidance through all steps of the assembling process. It allows users to build a personalized house filling their needs and expectations with the right project;
- Technical assistance on part of the building process: building assistance is provided by engineers, technologists and architects at different stages and at many housing projects throughout a city.

The wide presence of build-it-yourself in Brazil raises the idea that developing products following this concept should have no or almost no rejection among working class families.

Santos (2002) suggests that having these products packed as “kits” would make easier for the government and industry to get to an agreement regarding benefits for this kind of social asset lowering taxes for buildings erected using them.

5 Research Method

The data collection for this research project was carried out within a low income community on the suburbs of Curitiba and it focused on the furniture used to divide living spaces within the houses. The initial phase involved a literature review on the issue of DIY and, subsequently, it was carried out a mini-survey within ten houses with low-income community, followed by a case study on furniture design. Curitiba´s City Council Housing Agency (COHAB-CT) has provided the researchers with access to the community.

It is important to mention that this study was developed in partnership with Masisa, a corporation that has as one of its strategic goals developing pilot “socially inclusive business” projects with low-income segments of the market. The company established the goal that 12% of total sales in 2010 would come from the base of the pyramid and socially inclusive businesses. To this end, Masisa has created partnerships with more than 300 of its retail outlets (PlacasCentro) licensed in Latin America so as to train carpenters in producing improved furniture that meets the needs of the poor. Also, in order to create a new sales force for these products it is contracting and training women from low-income segments of society. It is also helping carpenters, with the collaboration of other civil society organizations, to become micro-entrepreneurs and thus participate in the formal economy.

The aim of this particular project was the development of furniture that works as a partition wall. Most low-income houses in Brazil already use furniture to divide spaces but there is no product in the market that has been actually designed to this purpose. In order to achieve this goal the project involved UFPR (Paraná Federal University), the client (through COHAB – Curitiba´s City Council Housing Developer), the material manufacturer (MASISA), the furniture maker (PlacasCentro), a Furniture Retail Company (M&M Móveis) and Aliança Empreendedora (an NGO that provides support for cooperatives of craftsman). Next section presents the partial results of this phase and discusses some implications and opportunities of DIY solutions for the low income market in Brazil.

6 Results & Analysis

All ten houses investigated on this research project have already experienced the use of a DIY solution and most of this experience related to furniture. Also, every house on this community has adopted the practice of using furniture as the strategy to create artificial walls within the house. This practice was particularly frequent between kitchen and the living room (see illustration below). One important aspect to take into consideration here is the fact that what we call “living room” could be used as a bedroom in the night or a workshop during the day. This variations on the type of activities were absent on the design of all furniture solutions observed during this study. On the case of furniture that was used to divide living spaces this problem was worsened since it allow little flexibility in terms of position.

Based on these premises the research team at the Sustainable Design Research Center (UFPR) have generated around four hundred ideas after a period of one month of applying creativity techniques (from 635 and analogy to brainstorming). The range of solutions went from multi-functional shelves to inflatable furniture.

A key aspect for this first case study was its short term viability with regards to the manufacturing capability of the research project partners and, also, the requisite of simplicity on the assembling process. The product had to be compactable during transport and allow high flexibility to the user decide where exactly he/whe want to the division between the living room and the bedroom. Also, very important was the need to achieve acoustic insulation performance similar to a drywall or brickwall.

The chosen solution which was developed and tested by the research team is the “zig-zag” concept, illustrated on the next Figure. On this concept the furniture can be used on both sides and it is composed of a set of rectangular modular components, that allows a variety of layout solutions.

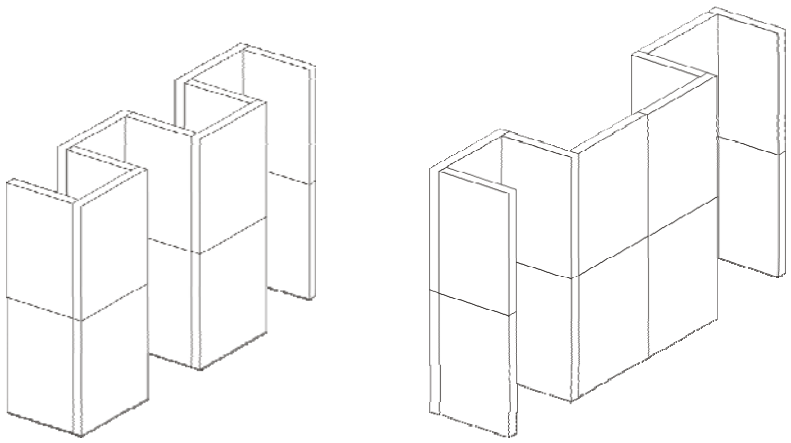

Figure 1 – Shelf to Divide Living Spaces within Low-Income Houses Using a Ziz-Zag Concept

Based on the barriers for DIY identified in the literature review and the observation carried out on the Sambaqui Community the research team have identified a set of important issues that should be considered on the development of this product:

- short learning curve leading to potential quality problems: none of families have experience on assembling furniture and the damages observed on the furniture were mostly caused by the lack of skill or knowledge on assembling, storage or transporting;
    - Lesson: the Ziz-zag Shelf has to integrate information design solutions into the product that go beyond written information; also it should consider the possibility of integrating mistake-proof solutions (poka-yoke);
- Resistance from conventional trades: this is the only barrier pointed in the literature that was not validated on this study. These families, as the majority of low income families in Brazil, were out of the conventional trade market. In fact there was even an urge to integrate more work into the community in order to generate employment;
    - Lesson: it will be quite valuable to integrate part of the manufacturing process of the Ziz-zag Shelf close to the community, which require the use of materials and process technologies available on the region;
- Supply-chain constraints: spare parts or technical assistance were not available at a reasonable distance and, quite often, the families have no economical condition to buy new parts/components anyway. Most of the furniture they have were second hand or it was inherited from their parents/relations;
    - Lesson: the Ziz-zag Shelf need to consider not only the need of using parts that are effectively available to the community but, also, the need for developing local manufacturers hence allowing its maintenance or upgrade on the long term;
- Lack of proper tools: none of the families have a toolbox;
    - Lesson: the Ziz-zag have to consider solutions that do not require tools and/or the use of very simples tools, including kitchen knives;
- Perception of DIY as an inferior product: that was indeed a widespread perception among all families. They pointed out that such perception occurs mostly because the type of material used on DIY products, leading to short life span. Also, they call attention to the perceived poor quality of finishing both in aesthetical terms as well as on durability terms;

- Lesson: increase the commitment of the user with the life cycle of a given DIY furniture requires solutions that result ona perception of it as a durable and more sophisticated product;

A first prototype has been produced (see next image) and the project now has entered on the stage of external validation of its concept. The image on the left shows some examples of alternative shapes and textures that has been developed for the structure of this shelf. The image on the right shows the final stage of the assembling process, during the trials of the first prototype.

Figure 2 – Visualization of the Final Product

With the idea of enabling small businesses within the low-income communities to have an active involvement on the production of this product or its components, the design team also conceived a number of accessories such as the ones presented on the next figure. These acessories provide further functions to the shelf and, at the same time, respect their economical constraints.

Figure 3 – Examples of accessories developed for the Ziz Zag Shelf

After tests carried out within a house build within the university, the project is now being applied on seven houses at COHAB-CT. This field study will enable a validation of the project and, also, enable the identification of further improvements on the design of this product. DIY has so far presented as viable alternative for providing furniture for low income families in a sustainable way:

- Environmental dimension: renewable materials, and use of scrap material, etc;
- Social-ethic dimension: focus on the well being of all individuals and means for them to practice their capabilities;

- Economic dimension: having as focus an increase in employment opportunities by enabling the engagement of workers with low or non technical skills.

Indeed, on the environmental dimension, for instance, a number of sustainable principles habe been applied, such as:

- To reduce the usage of materials and energy sources (MANZINI & VEZZOLI, 2002): with the substitution of a brickwall+shelves for a wooden shelf there is far less material involved; the product has been designed to reduce the need of packaging;
- To select materials that have lower impact on the environment (MANZINI & VEZZOLI, 2002; KRONKA, 2001): the wood used on this panel is FSC certified;
- To choose products and materials which are durable and which life cycle is compatible with their shelf life (MANZINI & VEZZOLI, 2002), preventing maintenance and high energy consumption (FUAD-LUKE, 2002): inevitable expansion of low-income houses face little problem with this solution since it can be disassembled and assembled elsewhere;
- To select materials which are found locally, reducing costs with transportation (MANZINI & VEZZOLI, 2002): all products are produced locally;
- To use materials that are easily recycled (MANZINI & VEZZOLI, 2002); advancing its shelf life and preventing dumping and use of raw materials to produce new materials: it was reduced the insertion of non wood material, enabling an easy recycling of the product at the end of its life cycle; besides, damaged parts can be easily assembled into smaller furniture;
- To use materials which have a scrap that can be recycled (FUAD-LUKE, 2002): the waste from the manufacturing process can be either burned to generate energy or generate wooed moulded products;
- To design products with components that are easier to set apart (MANZINI & VEZZOLI, 2002): the product do not require any special tool besides a screw driver.

DIY in the case of the Brazilian context offers a great opportunity to introduce sustainable principles within the homes of low-income families because it is already a reality in this populaton, weather the products have being designed to be DIY or not. This case study has shown that environmental constraints do not conflict with the need of producing products with lower cost and higher value. Decisions taken by designers, architects and engineers play a significant role in getting sustainability concepts applied to the construction of a built environment and fully integrating all dimensions in such a way to benefit the environment, mankind, and technological and economic development.

7 Conclusion

Current furniture market in Brazil provides a reduced amount of solutions aligned to the fact that around 85% of the houses in the country are constructed by the low-income families themselves, without any technical support. Hence, an important motivation to promote the development of DIY solutions on the context of a Third World country like Brazil is the possibility of closing the gap between the embodied knowledge (in embodied human subject) and the embedded knowledge (in the subjects and materials with and on which the subject acts), such as proposed by Dant (2005) apud Watson & Shove (2007).

By embedding products with solutions that consider the involvement of the user on the assembling process and by considering the existing embodied knowledge within low-income families, DIY seems to be a feasible strategy to provide higher living standards for these families.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Integration through communication tools

How design can facilitate social system integration processes

Gaia Scagnetti[1]

Abstract

Combining the opportunity offered by the findings of the Complexity Science, that has provided a theoretical framework to understand and study Complex Systems, with the empirical and theoretical knowledge about integration processes, this research investigates where Communication Design artefacts can intervene to facilitate in designing integration processes. This paper presents the result of an on-field research in Emergency hospital in Cambodia. The on-field investigation has used a qualitative research methodology (Grounded-Theory) and has led to design a model of sustainable integration. This paper results from a design oriented qualitative study aiming to define social integration in the context of the Complexity science findings, construct a conceptual model and develop an empirically derived theory that explains how to facilitate sustainable integration.

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1. Introduction

In contemporary discussion the notion of integration has many different meanings and is used in many different contexts so much as to be defined as an *umbrella concept* which encompasses a large number of ways this idea can be understood and will be understood in the future (Hornemann Møller 2002).
In defining the word integration the dictionaries note its relation to *integrare* and then to *integer*. Integer means whole or undivided, in the sense of being untouched or unhurt, and the Latin verb *integrare,* related to the participle *integratus* means renewed or restored (Ritter 1922).
Generally speaking, the word integration means combining parts so that they work together or form a whole and it is a fundamental concept in functionalist theory. It describes a mode of relation of the units of a system by virtue of which, on the one hand, they act so as collectively to avoid disrupting the system and making it impossible to maintain its stability, and, on the other hand, to *co-operate*, to promote its functioning as a unity (Parsons 1954).
It has been stated that the social science needs a variety of integration concepts to reflect the real complexity of society. The many different conceptions of integration and the many different connotations in which the concept is used should not be seen as some error to be avoided; nor should the goal be a single unitary conception of integration in society. **Society simply needs many different conceptions of integration at the same time** (Hornemann Møller 2002).
The British sociologist David Lockwood (1964) had distinguished between *social* integration and *system* integration. The first refers to the way individuals are related to one another in a society, while the second refers to the relationships between parts of a society or social system. In his essay, he criticised the two main approaches of sociologists: some theorists emphasize the relations between actors, while others downplay the role of actors and seek to emphasize the relationships between the institutions of society. For Lockwood neither of these two approaches is satisfying because the task of sociological theory is to overcome this dualism[2] examining both of those crucial features.

According to Lockwood idea that system integration is strictly related to social integration, in this paper a process of social system **integration is intended as the practise of structure a new configuration out of two social systems related one to the other or, in other words to form an interrelated whole by adding single actors or clusters to an existing system and maintaining and improve relationship within it**. In this framework social system integration can be seen both as a *state* of stable, cooperative relations within a social system, and as a *process* of introducing new actors and groups into a system and its institutions, and strengthening relationships within it.

The subject of social integration has long been a crucial concern of social sciences; it is a complex idea that means different things to different people and that do not have a unique denotation. The term can be made more concrete by specifying the elements, the resulting structures and their particular properties and they are applicable to any area of study. The interest in integration processes is actually increasing in different disciplines not only because of its wide applications - from the implementation of new infrastructure to the isolation in inner city communities - but also for its role in preventing situations of chronic conflict that can arise from an unsuccessful or bad designed integration process. Since the 1995 World Summit for Social Development, social integration has been considered a key point to forge agreement on social challenges and responses to them. The Social Summit, which was the largest gathering ever of world leaders at that time, reached a new consensus on the need to put people at the centre of

[2] The debate surrounding the influence of structure and agency on human thought and behaviour is one of the central issues in sociology and other social sciences. "Agency" refers to the autonomy of an individual from both internal and external inclination. In short, it refers to purposeful action of the individual. This term implies that individuals are free to create, change, or influence events. "Structure," or patterns of organization and institutions of society which constrain and direct behavior, remain outside the authority of agency. Organizational and institutional activities are characterized as structural behaviors (Hassan and Kundu 2005).

development. It identified social integration as one of the three overriding objectives of development, together with poverty eradication and employment creation. In commitment 4 the UN Member States committed themselves to promote social integration by fostering societies that are stable, safe and just and that are based on the promotion and protection of all human rights, as well as on non-discrimination, tolerance, respect for diversity, equality of opportunity, solidarity, security, and participation of all people, including disadvantaged and vulnerable groups and persons (Hemmati 2007).

2. Sustainable integration

It has been observed that contemporary world present a peculiar combination of integration and disintegration circumstances; on one hand, technological innovations have connected people and cultures, groups and individuals and have reduced cultural and physical distances. International and local economies are now highly connected in complex networks and faraway social systems are intertwined with each other's. The almost instantaneous information flow among individuals and groups has become powerful forces for cultural integration, promoting common interests, values and aspirations among them.
Obviously, expanding the boundaries of exchange and cultural contact creates both opportunity and risk.Rapid elimination of cultural and economic barriers among nations and peoples has proceeded for the past 20 years within a context of stubborn and recurrent recession, as well as increasing indebtedness, over a considerable part of the developed and the developing world. Within such settings, **the question of how to promote just and equitable patterns of social integration takes on special meaning**; and knowledge of local society, combined with a willingness to engage in wide-ranging dialogue is essential (de Alcántara 1995).

It has been argued that in industrial society a specific agency for integration is not necessary any longer, because integration would come about of its own, by means of something like Adam Smith's hidden hand (Spencer 1862). Even if undoubtedly time by itself could eventually end up in a state of integration, a deeper knowledge about how to facilitate the process will lead to a more sustainable intervention model. Sustainability is here intended to reduce the probability of fatal error that could produce conflicts and controversies difficult to be handled. Increasing integration imply that the complexity of social relations increase and people are more linked and intertwined. Disintegration, in contrast, signifies the undo of existing relations. The relevant question for those who look at social integration in these terms is not how to increase integration *per se*, but **how to promote a kind of integration which can be define *sustainable integration***.

In defining the concept of sustainable integration, some of the different elements that partake of the process and that can lead to critical situations – **fatal erorr, inertia, cost** - must be taken into account. Designing a sustainable process of integration means mainly to minimize the chances that the process will incur in fatal error. The notion of system inertia can be of help in understanding what fatal error means in the framework of integration processes. When working on such a project as the integration of a new infrastructure – where the design is a relatively short term action, the impact on the environment is highly predictable and more generally the project has been planned and carefully evaluated – the system has a low level of inertia: conflicts could quickly arise and lead to the complete halt of the activity. The fatal error is related to the project failure and is therefore easily recognizable. Differently, when intervening in such a case as the migration of a group in a different nation – where the process has long term evolution, strongly unpredictable consequences and above all a bottom up features – the system inertia is very high: conflicts won't be able to stop the process but will affect the amount of time needed to reach a situation of integration; in this case the fatal error is function of time.

Given that self-organization and adaptability is one aspect of how complex behaviour arises, it would seem unnecessary to strive for designing integration processes. Here the emphasis should not be put on integration but should be given on the concept of sustainable integration and

its relation with the notion of cost. An integration process that will last for a long time in a situation of stagnation or micro-conflicts entails very high costs in term of instability and stress that reverberate on both the systems.

Furthermore if the sustainability discourse is about how to make human systems last longer and have less impact on ecological systems and the sustainable development is the one that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland 1987), than talking about sustainable integration means paying attention to comprehensive outcomes of events and actions insofar as they can be anticipated at present. Despite the general use of the word integration there is no assumption that the relationships so described are harmonious. The terms social integration and system integration can embrace both order and conflict. Giving value to **an investment in terms of awareness and knowledge of the integration processes phases can play a key role in impeding that conflicts, inevitably involved in the process, become chronic**. Furthermore to reduce the level of stress in the system, facilitating dialogue and consensus cut the cost in terms of human and economic resources and make the integration process sustainable.

Design emerges as the discipline that can play a more constructive role in the definition of such a model of intervention in order to produce a positive re-orientation in the practice of merging two systems.

Combining the opportunity offered by the findings of the Complexity Science, that has provided a theoretical framework to understand and study Complex Systems, with the empirical and theoretical knowledge about integration processes, this research investigates where Communication Design tools and artefacts can intervene to help and facilitate the designer in designing sustainable integration processes.

3. Complexity and human social system

Complexity theory was developed in the physic field of theory in the second half of the XX century. It was built around an interpretative paradigm based on the notion that in a system with a large quantity of agents a high number of interaction process are able to form more complex behaviours and to change the structural condition of the system itself. Internal to a Complex systems are agents; depending on the scale of analysis, an agent may represent an individual, a project team, a division, or an entire organization. With roots in numerous disciplines, modern theories and models of Complex Systems, or more specifically, Complex Adaptive Systems focus on the interplay between a system and its environment and the co-evolution of both. Complex Adaptive Systems models extend traditional systems theory by explicitly representing the dimension of time and its related concepts (Scagnetti et al. 2007).

The above theories can be summarised as five main areas of research on (a) complex adaptive systems at Santa Fe Institute and Europe; (b) dissipative structures by Ilya Prigogine and his co-authors; (c) autopoiesis based on the work of Maturana in biology and its application to social systems by Luhman; (d) chaos theory; and (e) increasing returns and path dependence by Brian Arthur and other economists (Mitleton-Kelly 2003).
Professor Eve Mitleton-Kelly and the Complexity Research group have make a step forward on developing a theory of complex *social* systems and an explanatory framework that helps us understand the behaviour of a complex social (human) system.

Certainly human social systems are, by their very nature, complex systems, but particular attention must be paid in applying the complexity framework to the human domain as humans are far more complex in their behaviours as actors of a system than any others non human agents. As Nicolis and Prigogine (1989) has stated “It is more natural, or at least less ambiguous, to speak of complex behaviour rather than Complex systems. The study of such behaviour will reveal certain common characteristics among different classes of systems and will allow us to arrive at a proper understanding of complexity.”

4. Emergency and the research methodology

This paper presents the result of an on-field research experience in *Emergency* war hospital in Cambodia. Emergency is an NGO operating in war and post-war zones implementing high-quality rehabilitative care hospitals, designed to be handled back to local authorities when completely integrated in the territory. **The on-field investigation has used a qualitative research methodology (Grounded Theory)** [3] and has led to design a model of sustainable integration process. The two complex systems considered for this research has been the Emergency war hospital and the Cambodian social environment in which it was built.

This organization features suited the research interests. The structure of Emergency has two parallel realities: the organisation headquarter with its two offices in Milan and Rome that coordinate about 172 volunteers groups spread in all Italy and a network of cooperation projects in 13 countries around the world. This research focuses on how Emergency designs and implements its projects. Emergency interventions have specific characteristics:

- New project often originate in consequence of a **bottom-up process**. An emblematic case is the Emergency Sri Lanka project that was born in consequence of a significant private funding specifically addressed to the tsunami victims; the intervention resulted from a decision to use the many contributions on a project rather than give it back to the donors as the Emergency policy of intervention address only war and post war territories. This created a new knowhow in the organization of interventions in natural disaster areas

- Each project has specific characteristics due to the fact that the intervention conditions are always peculiar and different even if the intervention is carried out on a territory already known. Each intervention can be considered a ***wicked problem*** (Rittel and Webber 1973), always unique and novel in continuous evolution and with more than one resolution. This requires the system to be highly adaptive and reactive to the environment in which it operates.

- The result of each intervention is a self-sufficient and totally integrated structure designed to be given to local health authorities. This implies that each project has to foresee a **very subtle handover and withdrawal process**.

- A war territory is a highly complex environment, many agents are active and their **relationships are often hidden, unpredictable and non-linear**.

- The aim is the **integration** of the structure within the territory from the very first design phase.

The bottom up process, the wicked problem, the handover and withdrawal process, the complexity of a war territory and the value of integration have been one of the main reason to choose Emergency as a case study for this research.

The used methodology springs from the social research techniques framework and combines its methods in the so-called qualitative triangulation. In social research, at least four different meanings of the term triangulation based on a different reading of topographical metaphor coexist. The one this research refers to is the third reflective triangulation of the epistemological field of Hammersley e Atkinson (1995). In this framework the use of different techniques help the research to determine which conclusions can be derived by the empirical documentation delivered by each technique. Triangulation helps to identified and overcome the specific limits of each survey techniques. The use of joint methods allows to approach in a more efficient manner

[3] It is a research method that operates almost in a reverse fashion to traditional research. Rather than beginning by researching & developing a hypothesis, a variety of data collection methods are the first step. From the data collected from this first step, the key points are marked with a series of codes. The codes are grouped into similar concepts, in order to make them more workable. From these concepts categories are formed, which are the basis for the creation of a theory, or a reverse engineered hypothesis. This contradicts the traditional model of research, where the researcher chooses a theoretical framework, and only then applies this model to the studied phenomenon. (Wikipedia)

the two parallel reality of Emergency. From on hand both free and structured interviews has been carried out so as to set a research relationship with the Italian headquarter operators, from the other Grounded Theorymethods has been used in an on field research period in the *Ilaria Alpi* Hospital in Battambang, Cambodia[4].

There is a striking incongruence between on one hand patterns of social integration which bind people around the world more closely together than ever before and on the other the frailty of existing mechanisms for promoting joint action. But if different attempt to tracing the evolution of sociological theories about integration and community has been made, and very much attention has been paid on the process of integration between individual and society (Bosswick and Heckmann 2006, de Alcántara 1995, Hornemann Møller 2002, Delhey 2004), it seems there is a lack of studies providing tools for designing interventions in social integration processes between systems.

5. A model for sustainable integration

This paper results from a design oriented, qualitative study that aimed to define social integration in the context of the Complexity science findings, **construct a conceptual model depicting social integration processes**, and develop an empirically derived theory that explains how social integration can be facilitate suggesting which communication design artefacts can be use to facilitate the success of the step.

In this chapter, the model of sustainable integration developed in the research will be explain and described more in detail. Each phase is provided with a box that links the Emergency practical experience with the theoretical assumptions. Three keywords are also supplied to better orientate the reader in the understanding what happen in each phase.

An integration process between two systems can be synthesized in four phases: structural, cultural, interactive and identification integration. If we follow what happened to communication these four steps can also be defined as information, communication, dialog and knowledge phases.

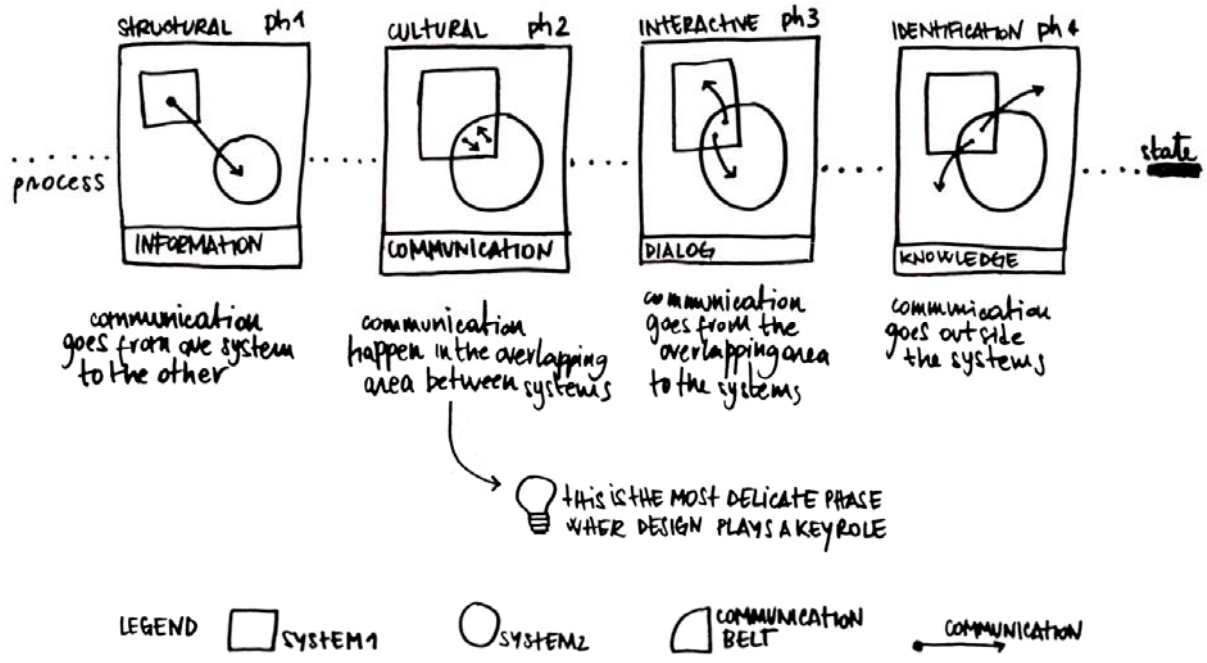

Fig. 1: Model of integration process

[4] The on-field research was carried out in winter 2007. The research on Emergency started in 2006.

5.1 Information

ACCESS SPACE POSITION

The *structural integration* is the phase in which System1 approaches System2 creating relationships among their elements. In this phase, the information flow has a stated direction and communication moves mainly from System1 in order to introduce new actors into System2. This is the process by which an actor acquires cultural standards and competence needed to interact successfully in the other system. **Social integration works on the base of identity**. The partners do not have to identify with each other, but they must accept each other's right to mean what they mean (Hornemann Møller 2002).

The peculiar characteristics of the two systems should be made evident as the intentions of change and integration. The most of information about the approaching system should be provided in order to facilitate the first connection with the approached systems. Fear and rejection is very often rooted in lack of knowledge: the unknown generates anxiety and denial of other culture, nation or religions. This means it is very important to represent and convey the systems identity which its rule and values. Transparency of vision and intentions play a fundamental role in this phase and ensure recognisability of the identity of both systems. Identity comes in many different shapes and forms, but always carries with it the double function of signifying differentiation, as well as relationship. Regardless of language or semantic nuance, the former indicates singular character, is about the state of being oneself (and not another), and remaining distinctive under different conditions; the latter centers on kinship, oneness, and likeness. Identification, then, is the act or instance of - identifying both to differentiate and to relate (Peters 2005). Visual communication is the first alphabet for creating a sense of identity and participation and to understand that pictures, colours and signs create a code which is used to get together, to share objects and spaces (Brunelli 2005). In these phase all those artefact that communicate identity and share vision and values should be considered as strategic device able to start dialog between the two systems.

Emergency has a very strong identity and since the early stage of intervention has tried to make evident the rule at the basis of its philosophy in developing its projects. These rule work on the concept of space as a medium for integration. More in detail: the host nation must provide a plot of **green land** where Emergency can build a **free high qualitative care hospital** in which it will be guaranteed safety and **neutrality** by the unconditional personal **disarm** of each person entering the hospital. These features define the emergency projects plot and establish a set of rules that are shared and made evident at the beginning of every project.
At the same time, Emergency shows great **flexibility** in the project management and a great ability in **adapting** to the need of the host country and in embracing its rules. The success of this approach is due to the Emergency ability in communicate its core values.

5.2 Communication

COLLABORATION COOPERATION EXCHANGE

The *cultural integration* is the phase where the two systems overlap. In this phase, some part of the two systems intersects and occupies a shared area where communication between the two systems primarily happens. This area identifies a space - dense of interactions, connections and dialogues - and can be defined **C*ommunication belt***. This is the area where the communication design tools can play a key role in facilitate the integration process. In the communication belt the system peculiar characteristics, its languages and features become evident: different cultures, opinions, beliefs and viewpoints face each other's. In the cultural integration phase **the two systems start a dialogical process**, pillar of this phase is collaboration and cooperation. To collaborate means that both parties commit the required resources and time to provide support to

viewpoints, follow up on key actions, and jointly perform due diligence. For parties to collaborate, they must have adequate information so that data can be assimilated, processed, and combined to evaluate and react to the negotiation environment (Harris 2007). In the Communication belt the two systems work together to solve problems. Every actor defines the problem in reference to its own knowledge, resources, objectives, etc. Actors can differ in their standards as well as in their perceptions of the situation, and consequently in their problem definition. Therefore, the outcomes of the problem definition by different actors can be different and, in some cases, even conflicting (Dente et al. 1998). **To minimize the conflicts impact a common language is needed.** As a matter of fact every design intervention is a fundamentally social activity and is therefore based on dialogical process, integration happens through a dialogic process between the system and its environment. Habermas (1987) has shown that to start a dialogue, discourse is necessary. Discourse refers to a context whereby individuals begin to communicate with certain mutual understandings and normative expectations. To facilitate a process of integration the designer should give very much attention **to create a common language that match or near the systems features**. Commonality of language is the most powerful form of interaction that enhances cooperation. Shared symbols, meanings, and communication rules facilitate both economic exchanges and social cooperation (Kuran e Sandholm 2008). If this is not possible and the two systems identities are inevitably hostile, the approach should be a combination of interest-based negotiation and consensus building. Conflicts can develop in any situation where people interact, in every situation where two or more persons, or groups of people, perceive that their interests are opposing, and that these interests cannot be met to the satisfaction of all the parties involved. Because conflicts are an integral part of human interaction, one must learn to manage them, to deal with them in a way that will prevent escalation and destruction, and come up with innovative and creative ideas to resolve them (Shamir 2003). The challenge could lay in the use of the visual language abilities, utilized for the definition of the common objectives, to create pivots so as to work in a resourceful manner even in a multi-organizational or multi-lateral context. All those artefacts able to shape understanding and clarifying meaning that have the ability to communicate narrations and to enable a process of storytelling and sense-making are here fundamental. This kind of communication artefacts takes many forms and appears in many media. Some familiar forms include mood-boards, maps, storyboards and scenarios. They are interfaces between knowledge and experience. They are a picture of impressions and points of view, rather than descriptions. They can be studied and used to generate new metadata, in order to discover new chances of change and development of the system we operate in (Scagnetti e Ricci 2007).

The first stage of the on field research in Cambodia has lead to the definition of the peculiar characteristic of this territory. If we compare them with the Emergency identity and behaviours, we can find an interesting correspondence. Emergency actions, choices and values often respond to the needs and distinctiveness of Cambodian society. This correlation has been made more evident by moving on to a higher level of abstraction in categorising these emerging properties (following Grounded theory methodology). For example, Cambodian people are used to call dust the *Cambodian snow* and they hate it very much. In categorising this behaviour abstractly, it can be interpreted as a need of protection and defence. Emergency responds to this need providing in its hospital a green and very cared environment and putting strong effort in taking care of it – Emergency maintenances paint the hospital wall face in white every season in a very hard job against dust and rain!
Another example, Cambodia is a country of contrasts, between the wet and the dry season, between the jungle and the wetland, between a land that feeds people with its products but often kills them with landmines. Contrast is a sensible[5] concept that portrays Cambodian identity. Emergency identity, with its red on white logos, with its name that seems to indicate very quick and necessary interventions but then its patience in taking care of long-term patients[6] include in itself the concept of contrast.

[5] In Grounded theory methodology they are called *sensitizing concept*.
[6] Traumas are very long time recovery injuries

5.3 Dialog

DEPENDENCE COEVOLUTION

In the *interactive integration* phase the two systems interaction results in a completely inclusive dialog and communication flow goes from the Communication Belt to both systems. **The generated knowhow reverberates within the systems themselves producing dependence and co-evolution**.The notion of co-evolution means empowerment, as it suggests that all actions and decisions affect the social environment. No individual or organisation is powerless—as each entity's actions reverberate through the intricate web of inter-relationships and affects the social ecosystem. But co-evolution also invites notions of responsibility, as once the ecosystem is influenced and affected it will in turn affect the entities (individuals, organisations, and institutions) within it (Mitleton-Kelly 2003).

Interactive integration means the acceptance and inclusion in the social networks of system2. Communicative competencies of the cultural integration phase are preconditions for the interactive integration stage. Complex systems have a history. Not only do they evolve through time, but also their past is co responsible for their present behaviour. In a complex system is very different to design for short term or for long term. That is because interactions are non-linear. A non-linear change is a change that is not based on a simple proportional relationship between cause and effect. Therefore, such changes are often abrupt, unexpected, and difficult to predict. A small change in the value of a driver could produce a disproportionate change in the outcome. When an organisation as a system is thus disturbed (e.g. after restructuring or a merger), it may reach a critical point and either degrade into disorder (loss of morale, loss of productivity, etc.) or create some new order and organisation—i.e. find new ways of working and relating—and thus create a new coherence (Mitleton-Kelly 2003). **To facilitate the creation of some new order and organisation designer should concentrate on the dynamic interaction among the elements**. The interaction does not have to be physical it can also be thought as a transference of information (Cilliers 1998). The process can begin by understanding the relationship that the system1 seeks to establish, then diagramming the relationships in which this strategic target is embedded, using a series of symbols comparable to a flow chart or organizational diagram. Once the diagram is complete, it is used to understand which relationship each tactic is expected to affect, and how. In the process of rearrange information it could be useful to look for driving forces converging and merging elements into meaningful clusters and relating the clusters to each other. Forming and studying these clusters helps to detect the driving forces of the system. Kees van der Heijden (1999) defines a driving force as a variable which has a relatively high level of explanatory power in relation to the data displayed in the cluster. By observing this rearranged diagram the systems criticality could be spotted, highlighting where the designer is required. This is an action of pinpointing able to suggest new directions for the design intervention. Visualizations clarify the relationships between the parties in a given situation. As an *abstract machine* a diagram goes beyond it own substance and representation to become an effective conceptual device. It is at the same time a tool for comprehension and design able to create significant relations between reality and its interpretation. This happens because the relations between forces, or power relations, are merely virtual, potential, unstable, vanishing and molecular, and define only possibilities of interaction, so long as they do not enter into a macroscopic whole capable of giving form to their fluid matter and their diffuse function (Deleuze 1981). Indeed diagrams effectiveness lays in the ability to act as go-between with explicative functions of the different correlated quantities, as a sort of graphic shortcut for the representation of complex phenomena. They can be used to identify which key relationships need to be affected to move your strategy forward, what tactics are currently being used or potentially available, how these tactics might affect key institutions, relationships, social groups and contexts that you want to target, which key groups, relationships or contexts are not affected by current tactics, what tactics might be brought into play to engage targets that are not currently affected, who are your potential allies for building a more comprehensive and effective strategy (Emerson 2008).

At one point when the hospital was fully implemented the Emergency staff noticed that the patient's relatives were feeling useless and uncomfortable in not giving anything in exchange for the free treatment the hospital was giving. This situation was engaging a feeling of distance between the hospital social system and the Cambodian people for whom the value of exchange and trade is central. This distance could have hindered the integration process and make the people feeling the hospital as something outside their territory social system. Emergency staff made the double choice of firstly ask the relatives to help in taking care of the patients - giving them free clean clothes and food and offering the possibility of take active part of the hospital system - and on the other hand donate blood for the hospital - even if the blood donation was something far from the Cambodian culture. Now in Battambang, Emergency has a blood bank that supply others hospital and NGOs. The interactive integration has successfully led to the we-feeling of the identification phase.

5.4 Knowledge

COSTANCY FUSION ENRICHMENT

In the *identification phase* the two systems form a new structure and produce knowledge that can be communicated outside. In this phase the two systems can be considered successfully integrated. The systems actors identify themselves with the new formed social system: they see themselves as part of a collective body. Identification has both cognitive and emotional aspects as Deutsch has argued: the populations of different territories might easily profess verbal attachment to the same set of values without having a sense of community that leads to integration. The kind of sense of community that is relevant for integration turned out to be rather a matter of mutual sympathy and loyalties; **of we-feeling, trust, and mutual consideration**; of identification in terms of self-images and interests; of mutually successful predictions of behaviour, and of co-operative action in accordance with it (Deutsch 1966). Inclusion in a new society on the subjective level – identification integration – is indicated by feelings of belonging to, and identification with, groups, particularly in ethnic, regional, local and/or national identification (Bosswick e Heckmann 2006). Social, moral, and emotional competencies are required to sustain interpersonal connectedness. Social competencies refer here to effective communication. Moral competencies are the basis of trust—for example, accountability, reliability, credibility, and honesty. Empathy and a capacity for commitment are examples of emotional competencies for connectedness. Connectedness also means identifying with a larger group. Connectedness in this sense is subjective—the feeling of being part of a whole. Identification is based on the perception of *having things in common with* others and leads to the sense that one has a stake in (is personally affected by) what happens in and to the group (Ware et al. 2007). The social integration at this stage **has to be maintained as it is potentially reversible even if successfully achieved**. The communication artefacts that help in maintaining and strengthening the mutual agreement between the two systems are very important for this phase. They are highly contingent on the context for which are designed, they convey the knowhow outside the systems and aim to share experiences, skills and knowledge. Report and article, publication and conferences are the typical example of these kinds of communication artefacts. This group also include those behaviours and performances able to narrate and make visible the systems knowledge resulting from the process of fusion: **knowledge itself is vehicle for communication of an enrich identity**.

Cambodian poor people in the countryside around Battambang were interviewed on their knowledge about Emergency. The results of the research were very interesting: even if Emergency did not communicate itself on the territory with the artefacts typically used in this phase as publications or ADV campaigns, the knowledge about the hospital had spread around the country. What people knew about Emergency was not that it is a free and international hospital, neither that it is an NGO project for land mines victims, but what they did clearly know was that if someone is victim of a trauma should go to Emergency facilities. At this point of the

integration process the kind of knowledge people have about the Emergency hospital had resulted be strictly related to their performance and their practical acting and partaking of the Cambodian society.

6. Limits and future work

The integration model described in this paper do not has to be considered exaustive, it rather provide a theoretical framework that incorporates many communication artefacts suggesting a use of them with a special attention to improve the designer consciousness about what is happening within the system he is designing for. The Communication belt is a operational concept that help in gaving a stated direction for facilitating integration processes, it is a *space* in which the two systems tell a story about themselves. It can be identified both as that phisical space surrounding the hospital both as a space of communication and dialog that evolve throught the different phases of the process.

The next step of this on going research would be to prove the practical utility of this model especially from the early phases of integration processes. The output of this research focussing on the Communication Design abilities is now to be development in a project: a practical tools based on this sustainable integration model that could help practitioners in using communication artefacts to facilitate the process of social integration between Complex Systems.
Given the need of integration, taking experiences from the local level into account might help to transcend the difficulties that result from ignoring the hidden dynamics between two systems that are approaching each other's and the complexity of these systems, thus making an important contribution towards a sustainable framework for designing integration.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

WHEN HORNS BECOME METHOD

Celso Scaletsky[1]

Abstract

This article addresses the possible and desirable relationship between applied and academic research. The project set up for Indústria Sander in southern Brazil and the study about the blue sky survey concept developed in it seek to provide fresh knowledge on the project processes contained in the design activity.

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1. Introduction

Sander Company counts with over 80 years of existence and is specialized in the transformation of horns and bones into combs, buttons, handles for pocketknives, covering ceramics, among other products. From the serial production of objects to handcrafted objects and from the simple bone that becomes a dog toy to the sophisticated buckle of women's shoes, Sander products are high quality. However, the company was undergoing financial difficulty because its products value is the lowest in the value chain. This, plus the Brazilian exchange crisis in 2007, created an unbearable situation for the company. Great amounts of commodities are produced by Sander daily and exported to countries such as the US, France, Germany, and Australia. It was amidst this threatening situation that Sander sought the Design Center of the School of Design at Unisinos for the development of a new product.

The School of Design at Unisinos sprung up from the cooperation between Universidade do Vale do Rio dos Sinos and POLI.Design – Consorzio del Politecnico di Milano. The objective was to create a center of excellence in design in the south of Brazil. All actions of the School of Design are based on the concepts of strategic design and product-system. In 2007, at a lecture for the Specialization Course on Strategic Design, Venanzio Arquilla from POLI.Design defined in a nutshell these two concepts as "the whole of products, services and communication (the product-system) with which a company places itself in the market and in society and shapes its strategy and its offer". This position demands designers to see beyond the classic action of design (pode deixar assim…) – focused in the product that is being developed – and articulates services, communication, and experiences that may be associated to it within a previously idealized strategy.

The present paper presents in brief how the Sander Project was developed and how it inserts itself in the theoretical reflection that seeks to understand processes and methods used by designers at the early moments of conception. More specifically, this paper deals with some project strategies that aim at the creation of concept maps and blue sky research. These concepts will be defined and detailed herein. This investigation created possible and necessary relationships between applied and academic research.

2. Project Development

Definition of the brief

Design and project are two very close words, and this topic has already been quite developed. The two words may be used to describe both a creation process of something that does not exist in time (the act of projecting something forward) and to describe the result of this process (the project). Moreover, design is used to describe a relatively new professional activity whose frontiers are not well-defined. In professional courses based on the project's culture, the creation process is many times associated with a complex problem-solving process. Such problems have two characteristics: first, not being well structured; second, being open. They are not well-structured because they are usually vague and full of contradictions in the beginning. They are said to be open because a single problem allows for several solutions, which many times are all valid. For Herbert Simon, the problem-solving process could be translated as an investigation in the interior of a huge maze of possibilities, a maze that describes an environment (Simon, 1991). Donald Schön goes further in the fields of knowledge related to the culture of design and says that "in applied sciences it all depends on the understanding established when one decides on the objectives to be achieved. If the latter are steady and precise, the decision to act may present itself as an instrumental problem. However, it they are confusing and conflicting, one cannot even talk in terms of a 'problem' to be solved. A conflict over objectives cannot be

solved by using (classic) applied research techniques. On the contrary, it is through the structuring of the problematic situation that one may organize and clarify the goals to be achieved and the possible means to reach them; it is not a technical process" (Schön, 1994). For Flaviano Celaschi and Alessandro Deserti (Celaschi, 2007), this process is closer to being characterized as problem finding, that is, the search for directions towards which innovations may be guided, or even problem setting, the characterization of the problem to be solved taking into consideration the complexities of contemporary life. The construction of what design calls design brief is an essential creative preliminary activity that will conduct the process towards the stage of problem solving.

In the case of Sander Company, this process was no difference. The first articulations helped understand the context of risk the company was undergoing. The brief was characterized by the need of imagining a new product to be developed, one of greater added value that would work as a pilot that could affect all the rest of the company.

Carrying out of the studies

Three researches were conducted for the Sander project. The two first tackle the definition of the profile of the company and its productive materials/processes. These two are briefly commented herein because they are not the object of discussion of the present paper. Prof. Felipe Campelo characterized the company as "being bought" by costumers but has difficulties in "offering itself" to the market. Nevertheless, Sander's success in international fairs showed the potential of its supply. On its turn, the research conducted by Prof. André Marques identified the two main productive processes related to bones and horns. The great waste of noble raw materials called attention and decisively influenced this work.

Blue sky was the third study conducted by Prof. Celso Scaletsky and jewel designer Moema Debiagi. This study is discussed in detail in item 3, which demonstrates the relationships between applied research and theoretical investigation. The study pointed to some behavioral trends that were tackled at the workshop to develop project concepts.

Rebrief

The studies conducted and the close contact with Sander led to what is usually called rebrief. We observed that the creation of one, two or three new products would not be enough. Within the concept of product-system we decided to guide the workshop towards the realization of a system of components with its own identity, one that could be adapted to different contexts of use, for example, something similar to one of the connection images made by Azerra Company, present in the blue sky study. Combined these pieces or components generate completely different products that are adapted to particular realities. Similarly, the new guidance indicated that this system of components should preferably be manufactured either with daily production residues or by means a more rational use of basic raw materials. The transformation of "waste" or low added value products into precious objects became the conceptual image of the project.

Workshop

The workshop lasted for 3 days; around 10 professionals and students were divided in two groups; each group generated a "competing" concept for the project.

- Concept 1 – *Links*
  From the definitions presented by the studies and the formulation of the rebrief, group 1 based its work on the idea that company materials established a link between past and modernity and that the formulation of the new system of products should reaffirm this aspect. In the end, this relationship was conceptually called *link*. The group developed a system of links that could create varied products through the combination of metallic bolts and other accessories. This system will be traded as mounting kits. Thus, the product-system was characterized in the idea of the kit (product), in the way to trade it, and this lead to a fun experience of mounting and combining pieces (experience), creating a strong and easily recognizable identity in the image of links

(communication);

- Concept 2 – *Sander Homeskin*
  Having the same basis as group 1, Group 2 sought to mark Sander with a new and strong identity (communication). The proposition sprung from the realization that the company already developed surfaces manufactured from bones or horns (checked ceramics of approximately 2.5 x 2.5 cm). However, Sander was not recognized as a company that develops these products. The developed concept proposes that Sander presented itself to the market as a company that makes surfaces and generates trends. Annually, Sander could launch a new surface line that, contrary to what happens nowadays, would have a name and a brand. Thus, the company would advance one step in the productive chain. To exemplify this concept, 6 new surfaces that could be characterized as the 2008/2009 surface line were imagined.

The two generated concepts were reworked on after the workshop was over. Details were added to each of the products, and the result became a publication. This was the moment of valorization of workshop results. The work printed with the two concepts was given to the company and is to become a project development for its production. Besides the concepts, the most important result of the work was to show the company the need of a new market position and to indicate ways to reach do it.

3. The blue sky study

Theoretical basis

Up to this point, the development of the project carried out for Sander Industry was presented. However, the main objective of the present paper is to demonstrate the possible and expected relationship between an applied and academic research. More specifically, this paper approaches strategies to construct design concepts through concept maps and a blue sky research; finally, it shows how these concepts were applied in practice to the Sander project. The present paper is a continuation of previous studies focused on the definition of mechanisms that can stimulate and favor the generation of design ideas.

The design process may be artificially divided in stages. For example, for Jean-Pierre Chupin there would be long stages called sleeping phases or quiet phases of visual exploration. These phases are characterized by navigation as a dream and free interpretation of the project context and are interchanged by short phases called awakening phases or intensive phases of fast model figuration (Chupin, 1998).

Another possible representation for the creation process in Design divides projects in two major stages: one called *metadesign* and another called *projectual*. In this representation of process, the *metadesign* stage takes place as a “knowledge platform that supports and guides project activity” (Moraes, 2006). According to Dijon de Moraes, this stage does not aim to formulate ideas or precious and concrete outputs. According to Moraes, the idea of the metaproject is inserted in a highly dynamic, constantly mutating space that is characterized both by the complexity of the act of projecting and the complexity of contemporary society. All these models of representation of the projectual act are evidently characterized by nonlinearity, redundancy, as well as by its elliptical cycles. Every model of the complex process of creation will be imprecise, for in the origin of the process there will always be an open and not well-structured problem.

This study focuses the first moments of the project in which concept designers aim to identify opportunities for their projectual action. Here we are close to the moments that Chupin called “navigation or dream” or that Dijon called metaproject. Our intention is to propose mechanisms that reconcile the intuition of the project designer (hardly programmable) with elements that are defined by many authors as “facilitators of thought” (Gosselin, 1998).

Often such mechanisms are based on less direct looks, which seek references in other domains that are not directly articulated with the design problem. This type of research is many times associated to the idea of lateral view or a blue sky research. In general terms, a blue sky research seeks examples and stimuli (in the most varied forms) in order to, by means of transferences through analogical thinking, obtain indicatives of possible scenarios for the construction of answers to a design problem. Scenarios are spaces or possible worlds; they are not necessarily materials, where designers may "act" in search of answers to the brief.

We have presented (Scaletsky, 2007) how according to our investigation the two forms of above-mentioned studies may be organized and represented through concept maps. According to Joseph D. Novak, concept maps are graphical tools used to organize and represent concepts and their links or relationships. For Novak, this way of observing and organizing exiting knowledge makes space for the creation of new knowledge (Novak, 2006). In the context of the present investigation, the new knowledge will be the possible scenarios where a designer may create. Thus, concept maps may work as a support not only to represent studied elements in the first stages of the project but also to work as leverage for the generation of ideas. Experienced designers usually draw simple maps and graphs and after that group them by topics or affinities. Little by little, project scenarios are constructed. The present investigation aims to create or test some graphic and computerized tools to facilitate this work. Concept maps represent a support tool for analogy thinking, which consists of important factors to solve design problems. According to Hernan Casakin (Casakin, 2004), analogy thinking is a process of identification, mapping and transference of knowledge between a problem (target element) and familiar and known paradigmatic situations (source elements). As it is proposed here, the construction of concept maps as an articulation between concepts (represented in the maps by us) and its propositions may work both as a tool to represent analogies and as a tool to provoke new analogical thinking.

The Sander Case

The first contextual researches sought to identify the current Sander costumers, products supplied, and equipment used in production. A first approximation led us to identify some key words that could work as concepts. Figure 1 shows how these concepts were represented in a concept map constructed by means of Cmap software[2]. At that moment, the project idea consisted in the construction of a system of components that could be combined in many ways and applied to several areas, such as fashion, home, or free gifts. Later, workshop participants opted for focusing on home products.

During the construction of this map, many difficulties in the representation of images were observed. Analogical visual thinking is an important aspect for the type of proposition made by us, and in the continuation of this investigation a solution for this problem should be sought. On the other hand, the easy handling of Cmap software makes concept organization a simple and efficient task. The diffusion of this resource via web is another factor of interest since it favors the communication between the professionals who work in the development of this product line. In the initial moments of conception, computerized support tools for the project must possess this quality.

[2] Cmap software can be obtained on the following site:
http://Cmap.ihmc.us/Publications/ResearchPapers/TheoryCmaps/TheoryUnderlyingConceptMaps.htm

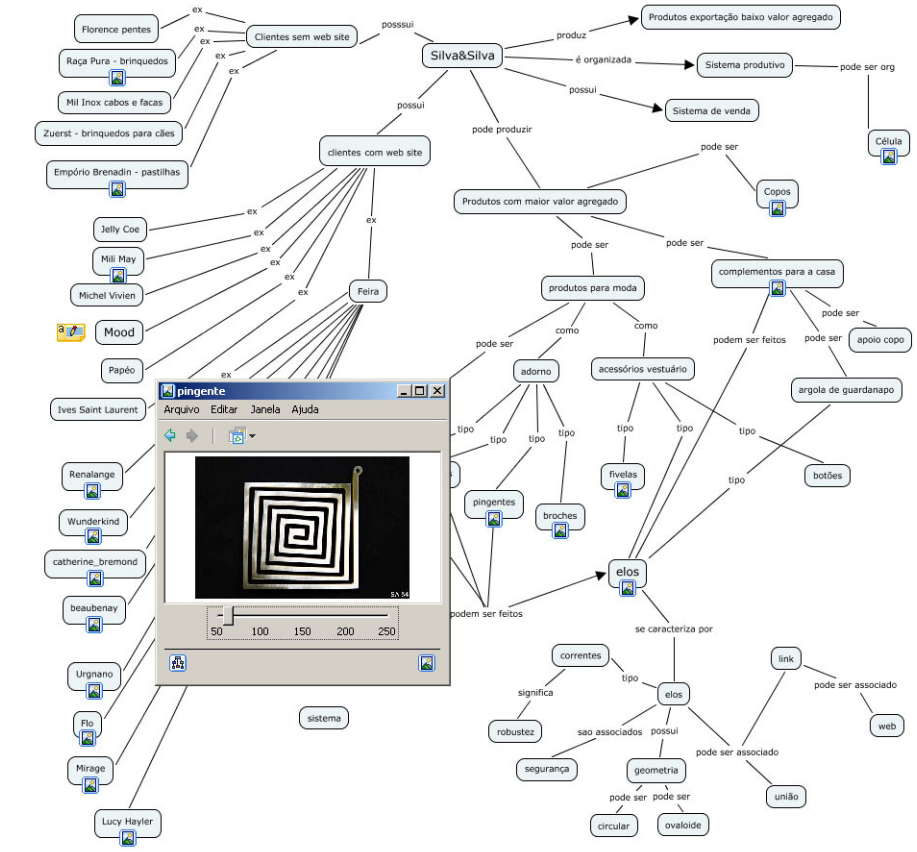

Fig. 1: Example of a map constructed with Cmap software. Source: Celso Scaletsky

The concept map partially helped the organization of the main work in this stage of the project that represented the construction of the blue sky research. From the concept map, it became more evident that the new product to be developed by Sander should have characteristics that would differentiate it from artificial. The image of plastic products, cheaper and many times more efficient, was always present in our thoughts. The opposition between artificial/plastic and organic/horn was the way to find the support to shelter the reference images that would be sought during the blue sky research.

Most of blue sky researches that serve as reference to the present investigation are characterized by the quality and consistency of their information. These studies were sought at presentations made by professors of the Polytechnic of Milan who often visit the School of Design Unisinos, where the present investigation was developed. The difficulty of investigations that focus this moment of the design process has been a lack of academic papers that seek to better understand how blue sky research are constructed. How much method there is and how the method is related to project designers' intuition are questions that arise. In this sense, the Sander case served as a real case of reflexive observation. From the first approximation made with the concept map and through our innumerable internal discussions, we reached the fundamental nucleus of the blue sky research: artificial X organic. This nucleus soon focused on the dimension that interested us most, that is, the "organic" dimension. Blue sky research favor the transference of visual, textual, sound or other types of knowledge or information. This transference is only possible from the existence of elements in common between strong analogy elements. Despite the broad look towards other reference sources not necessarily connected to the project problem, the blue sky research needs a support to justify it. The difficulty is defining these points in common that bridge the universal whole to the specific project problem.

The procedure adopted was to generate a series of key words that could work as “drawers” where reference images would be stored[3]. These key words underwent several filtering processes. Many images were found and stored, and these images served as a test to the adequacy (or not) of one key word or another. Finally, 12 key words were inserted in the organic circle. The 12 key words were related by means of 6 opposing axes (Figure 2). Each axis had a name that established the field of relationship between each pair of key words. For example, the key words “slow life” and “fast-food” are related by an axis called “life style”. To a certain extent, a blue sky study thus organized resembles the concept of concept maps as knots (slow life and fast-food) connected by propositions (life style). From this definition the way was opened to the systematization of the blue sky research.

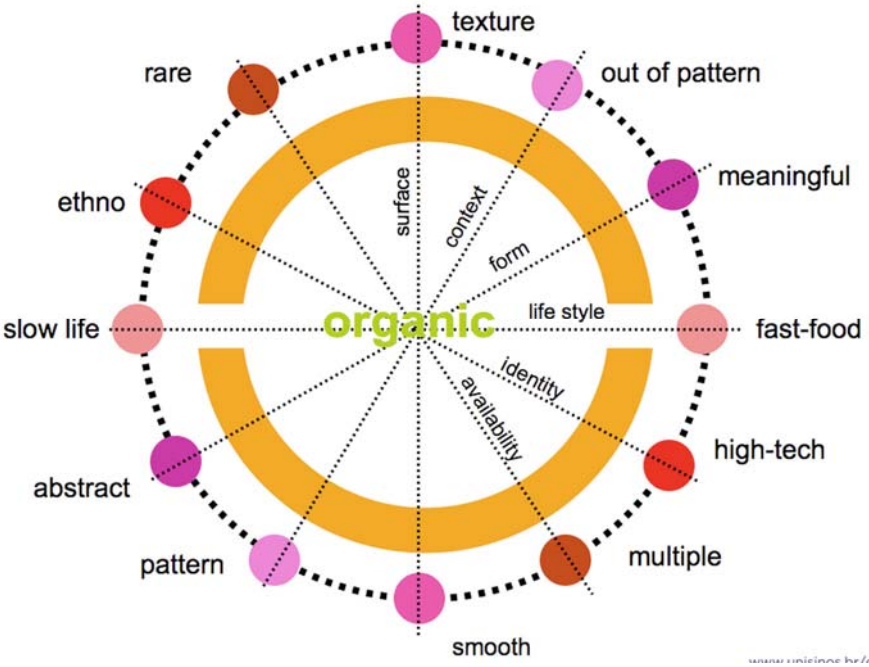

Fig. 2: 12 key words and their opposing axis. Source: Celso Scaletsky

[3] References may be sounds, smells, texts, or static or moving images. For a designer, image, even static, is an important source of knowledge as long as it is interpreted and not passively absorbed by designers. Consequently, our investigations have always favored images as main sources of project reference.

Fig. 3: Examples of reference images of the blue sky research. Source: Celso Scaletsky

3. Conclusions

The organization and strategy for the construction of the blue sky research for Sander had a clear intention of associating the left column (slow, ethno, rare, texture, out of pattern and meaningful) with elements closer to those called organic. At first, slow, ethno, etc. would be closer to the basic raw materials of this industry. However, during the workshop some images similar to what could be called an artificial world came (unconsciously or not) to designers, in other words, some of the main ideas that later would become design concepts. The image of the metallic couplings and Lego itself clearly represent the concept of component system that may be combined and applied to several situations, such as proposed by group 1 in the workshop. On the other hand, images referring to textures seem to be closer to the second concept generated. It is quite hard to affirm with certainty the influence of one reference image or another. However, it may be affirmed that many times what seems distant to our design context ("artificiality") may be the key element to a project idea.

The blue sky research was equally important in the characterization and decision on the inherent characteristics of products made from horns or bovine bones mainly as to their formal diversity and irregularity. The position assumed was that no matter the product generated in this project these characteristics would be considered positive factors that precisely set a significant difference to, for instance, plastic.

The operational question as to the software programs used is yet to be further defined. The study developed herein was guided mostly by the formulation of methods related to the research called blue sky, not to the use of concept maps. There are overlapping points between the creation of graphs translated into maps and the organization of blue sky research, and perhaps these points in common are the key to the continuation of this investigation. The great challenge is to identify methods and strategies at a moment of the project characterized by intuition.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

A proposal for communicating systemic design

A "systemic tour" showing systems design applications in the region

Lidia Signori[1]

Abstract

The systemic design approach can activate a new economic model based on the design of industrial open cycles. This methodology invites the industry to apply natural dynamic: in fact, productive activities can reflect the way Nature is organized, where, for example, surpluses get metabolized and integrated by the system itself.

The Ecodesign 2nd degree of *Politecnico di Torino* has been launching projects focused on different application fields of the systemic design in the Piedmont Region. Those examples allow to structure a tour to understand the systemic approach directly on the ground, presenting solutions and real data about the systemic development applied on industry.
In a future optic, the systemic tour will be a useful instrument for didactics, research and industrial development.

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1. Systems design approach

Today's society has a linear approach towards economic innovation, progress and development. By analysing social, economic and political phenomena searching "cause-effect" dynamics, we will not get to have a global vision of the events, we will hace a limited study of the technical and specific solutions that do not take into consideration the connections among the different factors. In the design world the linear approach comes from the attention given to the project, but only regarding the production of products and services responding to market needs created upstream of the possible needs in a punctual way. This approach does not let us take into consideration the system of social, cultural and ethic values which represents the real essence of the product or the service and give dignity back to design.

The systems design approach allows to extend the reference borders, not limitedly to the product but extending the focus of the project to the series of connections produced and the individuation of the flows of energy and matter that constitute input and output of the productive, communicative and social system.

The basis of the systemic approach are to be found in Nature and in its operating dynamics. Man is effectively part of nature, he does not have the capacity of completely managing it, but can observe it and imitate it, and today more than never we have to learn from Nature as far as efficiency of materials, processes, complexity and need of relationships are concerned. From electrons to cells, from living species to social communities and ecosystems, each of them is a complex system which exists thanks to the connection among its components, it lives on the base of the connections with other systems and establishes reciprocity relationships, always according to non-linear dynamics and evolution processes that various scholars, among which F. Capra, M. Castells, L. Von Bertalanffy, N. Luhmann[2], have been theorizing.

Starting from these assumption it should be easy to develop sustainable scenarios of social evolution, but nowadays the dominant culture shows communities that have completely changed their *perception* regarding their own constituent principles.

Today Man does not consider himself as part of an ecosystem, but lives as an individual in a society that tends to favour individualism. That loss of perception exists even in knowledge, which develops vertically, according to areas and sectors without inner communication, in spite of the strong impulse to multidisciplinarity that has recently been collecting approvals in the academic world but which is finding it hard to get real applications.
We are witnessing how learning is becoming more and more fragmented at all levels, from scholastic to scientific, in a process which is fostering high specialization in the different single areas of reference but is also having as a result the loss of the global and interrelated view of all phenomena. This fragmentation causes a loss of information, energy and matter, impeding the creation of connections among those flows.

[2] The systemic thinking deals with the context and the network of relationships inside of a system: in the front line the network and the connections among the elements and the whole, in case of an ecosystem as well as in case of a community or a natural organization system.
"In the systemic approach, the properties of the parts can only be understood by studying the organization of the whole. Consequently, the systemic thinking does not focus on single elementary bricks, but on basic principles of organization [...] Analysing means to disassemble something in order to understand it: systemic thought means to put the object in the context of a larger complex" (Capra, F.)

2. Communicating the systems design

The original meaning of the term "communication" is to pool, to share information as well as behaviours, cultures, "meanings" and everything that contributes to create social networks in the human societies which our community consists of. Communities, in fact, create communication networks and produce "autopoietic knowledge" in a dynamic, not linear, continuous evolutionary process.

If it is true that the evolution of our communities and the development of the communication networks follows the principles of the systemic thinking, way seems to be that difficult to communicate the systems design? We probably lost the cultural premises that let us understand what is complexity, what are the interconnections among events and relationships established among living systems; probably we are no longer able to observe Nature. Didactics and university research can contribute in training people able to observe phenomena from a different point of view. Besides, they create stimulus in new generations together with a broader vision of the same phenomena.

Scientific research, with its theory of complexity and studies of non-linear mathematics, faced the issue at a theoretical level: but the fact of understanding what complexity means, does not ensure you to find a solution, it simply describes an approach used to face problems. In fact, if physics and linear mathematics describe reproducible models and formulas that brings to a unique result, the results of the approach to complexity will be structures, trends and cycles, where numerical values cannot be measured because they depend on non-measurable factors. Nevertheless, the communication of systems design starting from these theoretical premises makes it understandable only by technicians and experts of the sector.

A less abstract example of systemic design application is the creation of school gardens: this way we understand how the study of natural phenomena allows a wide knowledge of different learning and not only.
At primary schools (children from 6 to 10 years old) there is a common practice of cultivating a garden inside of the school and this make the children observe a real natural cycle: birth, growth, decline and death, getting them aware of the natural life cycles that all the living creatures have in common. Besides, by observing the natural growth of plants and vegetables, we put the basis for the knowledge of the chemical and biological principles. Finally, the study of the natural “forms” offers interesting cues for non-linear mathematic sciences like the study of fractals or logarithmic growth. So those are no longer simple vegetables, but a multidisciplinary instrument in service of didactics.

These two examples let us understand how difficult it is to communicate the systems design: on one side complex scientific theories, on the other examples of elementary systemic development. In both case we do not use a language ideal for presentations or dialogues with economists and entrepreneurs. For this reason the Ecodesign 2nd degree of *Politecnico di Torino* has been actively working for 7 years with local productive realities in order to expand an ecological culture and develop systems design projects.
The research projects started with the students do not take into consideration single productive realities as linear closed processes, trying to observe them on the base of the internal and external relationships which characterize those productions.
Power use, emission monitoring, supplying and matter transformation, process output managing at territorial level undergo a planning redefinition that give back to the territory a wide production system, which is branch and complex, and tightly linked to the local administration of goods and services.

So we do not assist to a purely “green” project, but to the definition of a real economic model based on bioeconomics principles (or ecological economics): Nicholas Georgescu-Roegen, economist and founder of this economic theory observed as almost all economic process that produces material commodities decreases the power and commodities availability in the future. Matter decays and this decreases the possibility of its future use, this is way we need to radically

rethink economic science, making it similar to the complex systems that regulate matter and power flows.

3. Systemic tour: proposal for a communicative instrument

Thanks to the researches carried out by the Ecodesign 2nd Degree, by the II Level Master in Systems Design and by some other PhD researches[3], a lot of systems design projects have been actuated: some of them only as theoretical feasibility studies while others have seen an interesting practical development with local economic realities like SlowFood, NN Euroball and Agrindustria.
During the last years different issues have been faced, from hand-made food to industrial production, from the integrated development of a territory to the solutions to optimize the use of resources

- Frejus Tunnel: re-use of the specific mineral *(smarino)* proceeding from the extractions for the realization of the service gallery (in collaboration with Sitaf S.p.A.)
- Multilayer: proposals of collection aimed at re-using raw materials of multilayer materials to be used in productive and valuable applications (in collaboration with Amiat S.p.A.)
- Waste water treatment: analysis and proposal for the integration of domestic waste water cycles and others coming from local industrial productions, among which meat slaughtering (in collaboration with the District of Turin – Water Resources Department)
- Olive oil production: proposal for the integration of the olive oil production with the cosmetic and pharmaceutical industry
- Communicate the product cascading: case of coffee production in Colombia and communication of a systemic production path (in collaboration with ZERI)
- Micro-breweries production in Piedmont: possible use of the beer production outputs in the local context and development of the accommodating facilities – proposal for systemic menu
- *NN Euroball*: production of steel balls for ball bearings without using those contaminating oils used during surface washing and finishing processes, by using surface-active natural agents (in collaboration with NN Europe S.p.A.)
- Agri-food production on Cuneo district: valorisation of local resources for the future territorial development (in collaboration with Tecnogranda)
- SlowFood Presidia: excellence productions and output valorisation (in collaboration with SlowFood)
- Systemic Fair: project for the organization and management of a zero emission fair (in collaboration with SlowFood – *Salone del Gusto* and *Terra Madre*)
- *Agrindustria*: from the industrial processing of agricultural by-product to a biomass cogeneration plant for the energetic autonomy of the company, for the systemic management of the production outputs and local resources (in collaboration with Agrindustria s.n.c.)

[3] www.systemsdesign.polito.it

All the research issues are analyzed following the same methodology: firstly the introduction of the reality in its own territorial and productive context of reference; secondly comes the analysis of the matter and power flows, that is to say of the system outputs and inputs in the light of the raw materials and chemical-physical and energetic properties.
After a deep analysis of the production flow it's time to look for the possible connections with other local productive realities (even very different ones) which should integrate with the analyzed production. Generally this process leads to an exponential growth of the productive capacity of a territory of producing new material goods, offering services to citizens and consequently increasing productivity and jobs.
The most frequent critic to this methodological approach puts in question the fact that often we do not really need new productions, nevertheless the analysis of the context shows how the request actually exists but it is covered by imports or external resources.
Exploiting the territoriality of resources we increase a development that tends to benefit local realities, allowing the creation of auto-sufficient situations, under the energetic, productive and supplying point of view.

The Piedmontese territory offers many examples of application of the systemic thinking to design, nevertheless we do not have the connections and relationships to join the different experiences in a collective communicative project that could underline the peculiarities of each single project and offering a solid qualitative and quantitative base for the following studies and researches. In this area we propose a systemic tour able to create relationships among the different projects already started or in experimentation presents on the territory, so to have a real structure showing the systemic growth of communication, society and culture.

The tour is an instrument that gives the opportunity to totally merge in what one wants to visit and communicate, and what you visit can change the normal approach to didactics and industrial production. Thanks to the examples of systemic design applied to the territory and to the direct experience, you can notice rules and flows generating an open productive system and what kind of environmental and economic benefits you can obtain.
Obviously this kind of communication cannot be unilateral and only directed towards a single destination, but should address different levels of study. For this reason, it is important to create specific channels of information and learning.

First of all, it is very important to address the school system and young students (from primary to high school) who are accustomed to head-on didactic models and very rarely have the opportunity of training or getting direct on-site experiences. It is fundamental for young people to be stimulated and given the chance to compare different realties so as to develop new ways of communication and relate between the different components of a productive, ecological, communicative and social system.
Is well known that school age is the period when thoughts are more sensible to external influences: through the main phases of children's development they pass from the sensitive perception to the shaping of their personalities that will characterize them all life long. Thanks to their comprehension skills, even in abstract terms, and to their thinking elasticity, young students result to be the best interlocutors with whom to treat innovation issues, intended as generation of new ideas. This way we get to establish foundations for their ecoliteracy that should be a challenge for the future.
Being ecologically literate, or ecoliterate, means understanding the basic principles of ecology and being able to embody them in the daily life of human communities: the principles of ecology should be the guiding principles for creating sustainable learning communities

The tools used and the learning methodologies need to be restructured according to the needs but the mentioned examples of school gardens offers good didactic ideas. The possibility of visiting industrial productive realities integrated in the territory thanks to a systemic re-design of the flows of production offers other tools for an ecological didactics.

The world of university research has different learning criteria, but multidisiplinarity is the base of the systemic approach and today is the only real way research can develop.
Sustainable development, ecological education and systemic thinking are all feasible approaches

only if we all consider ourselves as part of a network where relationships have greater importance than single parts. Passing these concepts to research, If specializing in a determined field is fundamental, it is equally important to be able to comprehend the various relationships that exist among different fields of study, which also imply a universal grounding: only from the hidden connections among these different fields can originate new research areas and innovation gets to be possible, if we intend it not as technological obstinacy but as different perspective from where to observe problems, in order to find non-conventional solutions.
The possibility of observing real examples of systemic integration on the ground, starting new scientific, economic, sociologic and politic research partnerships with the other actors from the territory, implies an high innovative territorial development, oriented to progress.
The same tour is an example of multidisciplinary research because in order to communicate on different levels it has to dialogue with multiple disciplines and create topic path suitable to different interlocutors.

In the last analysis it is necessary to involve the entrepreneurial and industrial worlds. Systems design opens up the possibility of innovative and virtuous business models in which the waste, that is today a burden, tomorrow can become a resource for new industrial systems offering numerous opportunities of development in the region, in productive areas and in connected services.
For all the cases analysed in Piedmont it has been produced a document about its economic feasibility. Those studies underline the need of short term investments aimed at improving the infrastructures and the actual production, anyway the huge quantity of new productive flows produced and the best quality of the offered products, generates a lot of benefits. In this case also, an information network should be created among entrepreneurs to extend the possibilities that a systemic project can offer.

It is important not to make the mistake of considering a systemic productive reality as a cluster. In that case the stress would be on the territoriality of the enterprises, while they have in common only the location and the type of production. Those are quite different concepts compared to the integration with the territory in the larger sense of resources supplying and innovative development. In Italy, in fact, there are a lot of clusters that have been developing around a specific production (jewels, shoes, furniture...) but unfortunately none of them has an internal systemic management.

Any enterprise wishing to be competitive, sustainable and looking at the future in the optic of meeting the needs of the society and the current market requests, must relate with needs like innovation capacity, introduction of new technologies and action in always evolving areas right as the systemic approach proposes. Thus it is essential to develop multiple and simultaneous actions, able to consider both profitability and sustainability: from this point on it is necessary to create new learning models, a new professional role for designers, and it is also useful to deeply analyze the entrepreneurial activity of people that believed in the development of this model.

4. Conclusions

The systemic tour is not a simple visit to enterprises that have been developing a system design project on their territory, but it is intended to be a wide exploitation instrument. Depending on the target of reference, it is possible to create customized paths thinking about didactic infrastructures specially created to be introduced in the productive reality (the enterprise or a group of them), and, for some of the project, it is possible to develop a systemic tour simultaneously with the enogastronomic events on the territory. Quite often, in fact, a systemic design project develops strong relationships with the production and the consumption of local food.

Parallel to the ludic aspect of the tour, in the spirit of the integration of the scientific research regarding the different subjects, the firms interested in the project could represent real independent research centres aimed at developing new projects and increasing the existing ones, giving to universities the possibility of creating a real knowledge network.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

DESIGN METHODOLOGY AND SUSTAINABILITY:
Between craftwork production and industrial production

Virginia Cavalcanti, Ana Maria de Andrade, Germannya Silva and Vinícius Botelho[1]

Abstract

The article presents the methodological approaches used by the ***Imaginário*** Laboratory in the craftwork and industrial environment, and points out the relationship between design and sustainability.

The *Imaginário* is a research and extra-mural laboratory of UFPE, comprising teachers, professionals and students from several areas of knowledge and is active throughout the State of Pernambuco.

The strategies set out are exemplified using case studies of design; in the industrial environment, the CIV and in the craft environment, the Pottery Workers of Cabo.

Historical methods and comparative procedure are used in this research. The results point to contemporary possibilities of working on the diversity of insertion of the designer, using methodologies the flexibility of which are adapted to contemporary complex scenarios.

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1. Introduction

Artifacts reveal habits, values, knowledge, concepts and needs which, when analyzed together, permit the process of mankind's evolution to be understood. As silent witnesses of our civilization, artifacts represent our culture, not only the material one, but also aspects of immaterial culture, such as modes of doing, the forms of organization and management of what we produce.

One should not find it odd that the form of production of artifacts has marked the distinction between design and craftwork for such a long time. Currently, discussions take on other perspectives, and are committed to issues of sustainability. Therefore, the different forms of craftwork production, some aiming at uniquely authored pieces, others being the result of the production of utilitarian pieces produced collectively, illustrate the various possibilities for interface between craftwork and design.

In dealing with sustainability, and especially in developing countries, like, for example, Brazil, craftwork gains importance because it contains the possibility of generating income and including communities socially in urban and rural environments.

Craftwork, as a sustainable activity needs specific pieces of knowledge the broad range of which meets social, environmental and economic aspects. It is precisely where these pieces of knowledge meet that there is the great interface with design, for without losing the focus on the craftwork, it balances the dialog between social, cultural and economic questions.

It is not by chance that what can be observed is the growth in giving value to the participation of design in formulating development policies and, principally, those that target social inclusion and sustainability. In this case, the fomenting of craftwork and design in Brazil can be exemplified by means of governmental programs and support companies like the Support Service to Small and Micro Companies | SEBRAE.

The interlocution between craftwork and industrial production is, undoubtedly, facilitated by the use of design methodologies. The form of approaching the problem and the logic of procedures allow issues relating to use, form and meaning to be dealt with also in the sphere of craftwork. As a consequence, the relations established between consumers, users, productive systems and the market, using this point of view, make viable and prompt the formulation of public policies directed towards the social and economic development of producer groups of craftwork.

On the other hand, if we consider the investment policies for development, especially in peripheral countries, it is important to find alternatives which may permit the balance between fomenting development and strengthening small productive groups.

In order to transit securely in the universes of craftwork and industry, design needs, among other attributes, methodological tools which safeguard the path to be taken. This is the argument to be developed in this article, by means of comparative analysis between the comparative approaches used by the *Imaginário* Laboratory, based on reflection and the results of the actions implemented and products developed in producer communities of craftwork (Cabo de Santo Agostinho) and industries of the State of Pernambuco (Companhia Industrial de Vidros – CIV).

2. The *Imaginário* – path followed in research and extension

The *Imaginário* is a research and extra-mural laboratory of the Federal University of Pernambuco comprising teachers, specialists and students from various areas of knowledge. However, there is a predominance of designers in the composition of its team. Its mission is to

offer design solutions based on research and which are committed to sustainable development. It is active in the states of the regions of the south, center-west and northeast such as, for example, in the states of Pernambuco, Rio Grande do Sul and Mato Grosso.

The application of the knowledge produced with regard to craftwork production has contributed to the strengthening of the productive groups. In this sense, the activities undertaken together with the craftwork communities has nurtured the generation of jobs and income, the consolidation and the emergence of local community leaders and, principally, given value to local culture. The multi-disciplinary approach is oriented towards improving the quality of products and of production processes, taking into consideration respect for human, cultural and environmental issues.

In the industrial environment, applied research has prompted reflection on the design process and liaison with other areas of knowledge. The improvement in the quaity of products and productive processes, the satisfaction of the user/consumer and the market positioning of local Companies are results of actions of the Laboratory. As an example, the Companhia Industrial de Vidros de Pernambuco| CIV (the Industrial Glassware Company of Pernambuco), a partner since 2003, which has developed and launched 15 products, is recognized as one of the most innovative companies in the national market for tableware utilities in its category.

The *Imaginário* – craftwork environment

In the craftwork environment, the *Imagináro* laboratory started its activities in 2001 still under the name of *Projeto Imaginário Pernambucano* (Pernambuco Imaginary Project) and with the mission of *firming up craftwork activity in Pernambuco as a sustainable means of living, through interventions which respect the cultural values of the communities producing craftwork.*

Historically, the first actions were undertaken, 550 kilometers away from the central office at the University, in Conceição das Crioulas, a former runaway-slave community (*quilombo* in Portuguese) located in the municipality of Salgueiro, in the Pernambuco semi-arid region known as the *sertão*. The result of the actions led the community to winning the 1st World Bank Award for Citizenship, in recognition of the project giving value to *quilombo* craftwork developed by the Pernambuco *Imaginário.* Building on the success obtained in Conceição das Crioulas, and from 2002, the *Imaginário* began to work with other communities producing craftwork and widened its partnership with Sebrae-PE and other government and non-governmental bodies.

Since 2001, more than 500 craftworkers, distributed in 15 communities from the Zona da Mata to the Sertão have been guided by the *Imaginário*, amongst which are: Alto do Moura, Cabo de Santo Agostinho, Caroalina, Conceição das Crioulas, Goiana, Kambiwá, Lagoa do Carro and Tracunhaém.

The *Imáginário* believes, that by guaranteeing access by popular artists and craftworkers to the consumer market by means of coordinated and sustainable actions, it will be promoting giving value to culture and to organized forms of these and other communities, thus ensuring the modernization of craftwork production and strengthening other local structures which will sustain regional development.

The *Imaginário* – industrial environment

It was at the start of 2003 that the Companhia Industrial de Vidros – CIV proposed the partnership to the Department of Design of the Federal University of Pernambuco. At that moment, the company, a traditional producer of packaging for the foodstuffs and pharmaceutical sectors, was undergoing a moment of internal re-structuring and widening its *mix* of products to include utilities in glass. The challenge thrown down to the design team consisted of making the company's commercial interests and technological features compatible with the physical, social and cultural needs of the consumer from classes C and D[2].

Out of this partnership emerged the industrial environment approach of the *Imaginário* – established in the relationship between Design x company x consumer and with the focus *on improving the quality of the products and productive processes, satisfying the user consumer and market repositioning of local and national Companies.*

From that year until today, 15 (fifteen) projects for products have been drawn up, the successful results of which can be verified in the consolidation of the partnership of the company with the laboratory and, on the receptivity of the products developed on national and international consumer markets. This experimentation, undergone in the praxis of the activity and based on theory through research, allowed the main elements of the design process and the reflection on project methods to be identified and value to be given to them.

3. Methodology

Generally speaking, methodological approaches practiced by the *Imaginário* use the relationship between design and sustainability, such as Manzini argues for, in macro dimensions: the economic and productive dimension and the social and cultural dimension (Manzini 2006, 50 e 55)[3]. Although indissociable, and bearing in mind that the environmental theme permeates such questions, the classification of these dimensions will allow analysis of the conduct of the methodological strategies directed towards the craftwork environment and the industrial environment.

Methodological approach – craftwork environment

The methodological approach of the *Imaginário's* ways of acting in the craftwork environment has shown itself to be effective in generating strategies which are capable of promoting the social inclusion of communities in situations of vulnerability. It prioritizes strategic actions aimed at giving value to the cultural identity of the communities; it optimizes craftwork production through technological assistance; it widens publicizing and commercializing the craftwork produced; it contributes to promoting social inclusion of the craftworkers and fosters sustainable development.

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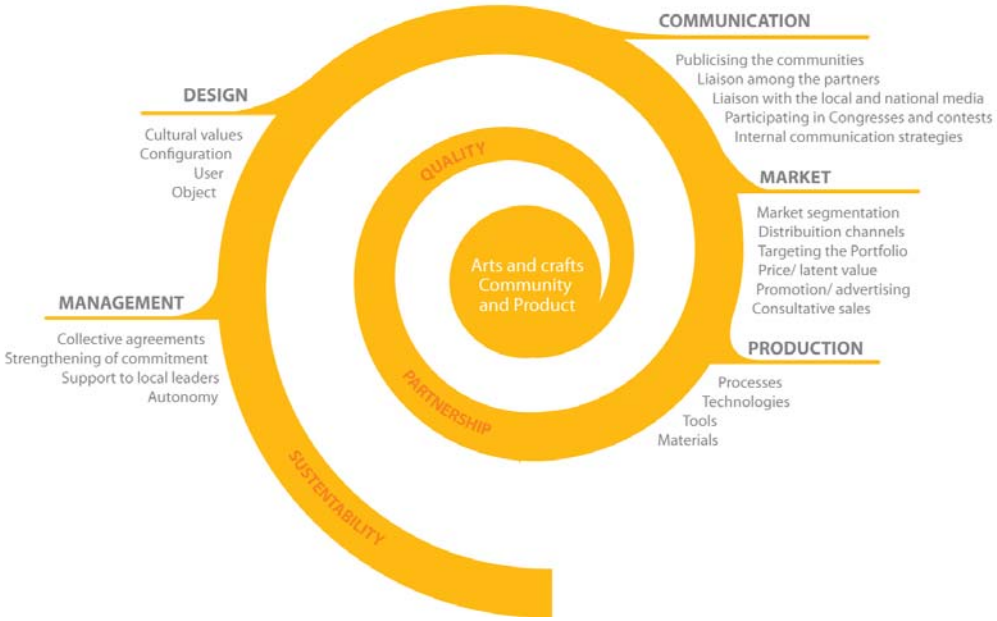
[2] The consumers of the classes C and D, according to studies conducted by A C Nielsen (2001), have a monthly income of up to R$ 1.800,00 per household and represent about 50% of the economically active population. These consumers are characterized by buying in cash (83.5%). For them, price is the decisive factor (61,5%) and so they are not loyal to brands. (http://www.acnielsen.com.br)

[3] Manzini presents, in the book *O desenvolvimento de produtos sustentáveis* (*The development of sustainable products),* the environmental requisites of the industrial products, the dimensions necessary for the scenario of a sustainable society: the economic and productive dimension, and the social and cultural dimension ; while the IDIS – Institute for the Development of Social Investment – Glossary classifies the dimensions into economic, social and environmental, but on introducing the concept of sustainable development another two dimensions are incorporated: the political and the cultural.

The *Imaginário* puts forward a format of intervention directed towards autonomous management, by nurturing the self-esteem of the participants, and, at the same time, investing in the growth of co-responsibility for undertaking collective projects. Integrated action, associated with a multi-disciplinary methodology, complement the directing and see to it that it serves, in a sustainable way, communities which traditionally and non-traditionally produce craftwork.

Ever since it was formatted, the craftwork-environment methodological approach has undergone adjustments by means of feedback from the actions implemented, always grounded on five axes which generate strategies capable of mobilizing (human and financial) resources and of promoting social inclusion.



Graphical 1: Representation of the methodological approach of the Imaginário | craftwork environment

Management

This fosters coordinating, forming and strengthening groups, by encouraging the construction of collective agreements and the search for autonomy.

Production

Based on the modes of production and respect for the communities' rhythm of life, the I*maginário* seeks to optimize the productive processes, improve working conditions and the sustainable use of the natural resources. The insertion of new technologies and tools guarantees the quality of craftwork activity and adds value to the product.

Design

Each piece is developed by setting out from giving value to popular knowledge, from acknowledging traditions, skills and the use of materials. Designer and craftworker create lines of products in which shapes, textures and colors reflect the cultural and social values of the communities. The excellence of the product and its compatibility with the demands of the market make the sustainability of the activity possible.

Communication

In order to generate information capable of raising the awareness of public opinion and mobilizing it towards the value of craftwork and the rights of its creators, pieces are created as are folders, labels, etc. A visual identity is constructed for each community which reaffirms the history, culture and feeling of belonging to a group, by printing a seal of origin and quality onto that which is produced by the community.

Market

This directs. The production of the partner communities is steered to specific segments of the market, which are able to recognize the value added to the product, thus guaranteeing a fair remuneration and in this way stimulating the continuity of craftwork activity.

The actions of the *Imaginário* are supported under a methodological approach which is participative, by setting out from the understanding that the men and women craftworkers are subjects of their practices; collective, by means of the incentive of constructing collective agreements and the recognition of local leaders; individualized, through recognizing the abilities and competences of those involved; critical, to the extent that it leads men and women craftworkers to make a reading of their own artistic activities; and contextualizing, since the intervention is anchored on the needs, wants and respect for the identity values of each craftwork community.

Monitoring and evaluating all the activities are undertaken conducted by means of regular follow-up encounters and meetings involving the technical team and the men and women craftworkers. The idea is to ensure the results are reviewed, to give visibility to the work done, and to re-define, if necessary, the strategies of acting by each community.

Access to the market by the communities producing craftwork is based on the preservation of the identity values and principles which guide fair trade. Therefore it is right for there to be publicity among consumers of the importance of products commercialized in a responsible way, which makes it possible for there to be fair remuneration and favorable working conditions, including the sustainable use of natural resources.

Sustainability evokes, in a wider sense, the idea of something that is long-lasting, it being a conceptual relation, and, therefore it does not make sense as an isolated idea. This steering towards a sustainable society is put forward as a conciliator of economic, social and environmental needs.

In such a scenario, according to Manzini, the social actors who act rationally in economic terms should also act positively in ecological[4] terms. This new economic paradigm can be seen in the experience of the Pernambuco *Imaginário* working with the group of pottery workers of Cabo de Santo Agostinho.

The case – Community of Pottery Workers of Cabo de Santo Agostinho.

The municipality of Cabo is endowed with natural resources which have been transformed into tourist attractions and economic potentialities which have repercussions in the development of the State as a whole, as in the example of the Port Complex of Suape.

Although the history of the utilitarian production in pottery in Cabo de Santo Agostinho stretches back to the times of the 16th century colonization by the Portuguese, from the 1990s, the demand for the production began to decrease. Having once been a source that generated

[4] Manzini stresses the importance of the social actors such as mediators of actions capable of promoting a sustainable society.

jobs and incomes for hundreds of families, many potteries closed their gates thus threatening the continuity of the craftwork tradition.

In view of this situation, the challenge fell to the *Imaginário,* together with the craftworkers and other partners, to define a strategy of approach which might strengthen the craftwork production of utilitarian pottery in Cabo de Santo Agostinho.

A full diagnostic study was drawn up, based on the observations of the specialists and craft workers involved. In order to enhance the process and economic sustainability, the *Instituto de Tecnologia de Pernambuco* (Institute of Technology of Pernambuco) – ITEP, a partner of the Laboratory, undertook trials and tests with samples of products produced by the community and evaluated the physico-chemical characteristics of the raw material.

Using these results, the Laboratory proposed a new format of finishing, being implemented in 2008 through the partnership with the Banco do Nordeste do Brasil – BNB by the acquisition of machinery to optimize the productive process.

New products were developed, thus diminishing the use of natural resources, and broadening the portfolio of products supplied to different segments of the market.

Fig. 1: In the Espaço Mauriti, craftsmen at work and the firewood kiln and products developed in partnership with the community

With regard to the development of new products and the reduction of the use of natural resources, the strategy was to maintain the technique and direct it to a market, the added value of which is perceived. Illustrated with the development of a ceramic totem in comparison with a water filter, this action widens the gains under various aspects.

	 **Totem tube**	 **Filter**
Volume de production	Small scale	Large scale
Sale	Directed at market segments	Quantitative
Profit	Widened Value added, brand, history, packaging and quality.	Reduced Yield in quantitative sale
Steps of production	Reduction and optimization of the steps of production	High quantity of steps of production
Remuneration of the craftworker	Far remuneration for the time worked by the craftworker	Low remuneration for the time worked
Production costs	Reduction of production costs and losses with an improvement of the flow ofthe productive environment	High cost of production and losses because of an environment that has been damaged
Purchase suggestions	Suggestion to the buyer of purchase of 3 modules	Single product

Table 1: Comparative table and descriptors of the benefits of the totem in relation to the water filter

At the request of the community which was eager to use new types of surface finishing on its products and, at the same time, the market demand for vitrified utilitarian pieces, a Project was drawn up for a kiln fired by natural gas. This is currently being set up and tests are being carried out. Setting up the gas-fired kiln required the planning of a physical space the location of which would be favored by the passage of a natural gas grid. The new space, built in partnership with the local Town Hall aims to be a training centre as well.

The proposal for using natural gas is to reduce the environmental impact caused by the extraction and burning of wood, and at the same time to make it possible to increase and control the combustion temperature, both of which are indispensable in order to obtain pieces with homogeneous finishes. The use of this technology will guarantee Cabo's line of utilitarian craftwork table crockery meets the technical standards required by the national and international market.

Fig. 2: Façade of Craftwork and Internal Area of the Architect Wilson Campos Júnior Craftwork Center

The use of new technologies associated with the availability of the new spaces for production and sale of products opened perspectives, which included other actors from the community. Young people were incorporated into the group in order to complement skills not found among the craftworkers, such as the use of computing science technologies both to publicize the products and to mange the sale and stock of products.

The multi-disciplinary approach and the dynamics of the process of interaction between the community and its surroundings brought about new challenges. With this outlook, new partnerships were established, involving local industries in order to share solutions for the destination of residues with the craftwork community. The *Indústria Cerâmica Porto Rico*, based in Cabo, made the residue of its production, dumped on neighboring lands, available. Experiments conducted on mixing this with original argile clay produced a paste with characteristics of plasticity compatible with the needs of the craftworkers. This initiative reduced the withdrawal of natural argile clay and, at the same time, reduced the production costs because of the proximity of the company to the craftworkers' spaces of production.

The management of production and commercialization was another challenge taken on by the group of craftworkers. The management of the Arts and Crafts Centre Arquiteto Wilson de Queiroz Campos Júnior required the making of agreements, widening partnerships and incorporating new skills. By considering the profiles and skills found and creating spaces for discussions, the *Imaginário* acted as intermediary for the construction of a working management model which integrates institutional partnerships, craftworkers and representatives of the community.

Methodological approach – industrial environment

For the industrial environment, the methodological approach sets out from *research*, reflects on and consolidates information with *analysis*, makes the product materially concrete by means of *synthesis* and implements the solutions by means of *ongoing monitoring.* These phases are polarized upon two large main concepts: utility and meaning, which transcend old dogmatic statements bounded in the attribute of function and established during the history of design.

The “utility” is related to making something adequate for use, this means that the form interferes in how the objects function and to what degree it meets its natural objectives. In other words, utility has to do with effectiveness, derived from technological and material factors. The “meaning” explains how the forms take on a meaning in accordance with the mode in which they are used. The meaning has to do with expression and feeling, and is subject to values which can vary between different cultures, and excites several interpretations for one and the same object. [5]

The graphical representation shows the main steps of the process of developing the product and its relationship with the company’s departments, especially the marketing department and the engineering department. The consumer is the fundamental element and participates in all stages of the process, which are cyclical and flexible in accordance with the specificity of the project. Nevertheless, it is in the product that there is the focus of actions of the multi-disciplinary team made up of university teachers, students and specialists with complementary knowledge and which permits various ways of looking at one and the same project problem to be established.

Graphical. 2: representation of the Imaginário | industrial environment

The feedback from the phases passes through the stages of incubation, creation and project proposed by the methodological process of the Design.

The case – CIV | Companhia Industrial de Vidros (Industrial Glassware Company

The Companhia Industrial de Vidros has been active in the market of glass products since 1958. It is part of the enterprises of the ICAL/ Cornélio Brennand group and is one of the three

[5] Gillo Dorfles in *O Design Industrial e sua Estética* considers the importance of the symbolical element found in the large majority of objects, a type of symbolism which he defines as “functional”. This is because, the object is led, from the project phase on, to “signifiy its function” in a perfectly evident way through the semantization of a plastic element capable of putting into relief the genre of figurativity which from time to time serves to indicate the specific function of the object to us.

largest glass packaging industries in Brazil. Its installed capacity is 1,000 tonnes of glass per day, the equivalent of 1.5 billion units per year. Its mix of products possesses quality at an international standard and positioning at competitive prices. These comprise **packaging,** which supplies various clients from the foodstuffs, drinks and pharmaceutical sectors and are already consolidated on the market with highly competitive prices; and the line of **utilities** which consist of cups and glasses, jars, bowls, and pots.

It has four factory units located respectively in Fortaleza (CE), Vitória (PE), Recife (PE) and Salvador (BA), which serve the world market from advantageous geographical locations, for all the units are close to the main ports and international routes.

The technology used by the company is called IS - Individual Section, a type of pneumatic machinery commanded mechanically or electronically. This type of equipment is manufactured specifically for producing glass packaging under the blow-blow and press-blow processes [1]. However, CIV and its competitors, on this market niche, make use of this technology to produce tableware.

Blow-Blow Process

The blow-blow process begins with loading a gob of glass, at a temperature around 1200ºC, into a pre-mold which receives an injection of compressed air and forms the neck. After the first blow, the *parison*[6] held by the neck is transferred from the pre-mold to the final packaging mold. During a second phase, compressed air is injected within the *parison* forcing it to take the final format of the piece.

Press-Blow Process

The press-blow process offers greater flexibility in conforming the *shapes* of the product, thus making it possible to have a greater variety of pieces in glass. The gob of glass within a pre-mold is now on a pin which will press the glass against the bottom of the pre-mold. The extraction of the piece is similar to the blow-blow process.

The great challenge for CIV was to insert itself into segment of utilities for the home, using the same industrial production process available for the production of the packaging segment. To do so, the company decided to become active in the consumer market aimed at the public characterized as C| D. CIV's utilities in glass section is, currently, accountable for 20% of the company's business, the turnover of which was R$ 200 million in 2003.

The Consumer

Data from the Jornal Valor of 2006 illustrate the growth of this segment in Brazil in recent years, with the argument being presented that this is due to an increase in consumption by classes CDE in Brazil since 1999 [3].

years/ government	Division of the social classes		
	AB	C	DE
1990/1994 Collor/Itamar	14	26	60
1995/2002 FHC	24	31	45

[6] Parison is the pre-format of the packaging, confectioned in the first step of the press-blow process.

2001/2006 Lula	24	37	39

*Class DE – Family income up to 4 Minimum Salaries

Table 2: The consumer in the Lula era. Source: Latin Panel – Jornal Valor 23.11.2006 p. A4.

Other social occurrences contributed to this reflection in consumption by the least favored social classes: the increase in the minimum salary during the period of the first mandate of the Lula government; agricultural prices at a low level and revaluation of the real in relation to the US dollar, all of which function as anchors for the inflation of commercializable products and raise the income available for consumption by reducing e cost of living; the importance of the informal market in Brazil; the growth of the participation of women in the jobs market; more credit available with an increase in the number of repayment installments. [3].

Faced with these numbers, one of CIV's competitive strategies to ensure the success of the business in the long term and, at the same time, to contribute to economic, social and environmental development of the community, was to invest in research and development in the area of design.

Innovation in the design of products, with the understanding of the needs, behaviors and life-style of the CD public, has been adding value to the products manufactured in glass by paying due attention to the aesthetic language and the quality standard offered to this class of consumers.

It is in this scenario, as a business strategy, that design translates the company's needs and objectives, by linking up areas such as Marketing, Production and Sales, uniting aspects of sustainable development (economy, society and market), to the real and symbolic needs of the individual and social consumer.

Fig. 3: Products developed by the Imaginário for the Companhia Industrial de Vidros

The methodological approach based on research and development required changes in CIV's organizational structure which incorporated research into the development of its products. This meant including gathering information and sharing data referring to aesthetic and symbolic aspects, which are fundamental in the definition of project parties.

Currently, the company has a nucleus for developing products, comprising professionals from various departments of the company such as marketing, production, engineering and quality, which is responsible for finding solutions to possible problems which may arise during the course of the projects for products. Today, the team has, on its permanent staff complement, one professional and one design scholarship holder. However, external design consultants are called

upon to be responsible for the projects, such as the way to seek shared solutions for the development of products.

In the case of the Companhia Industrial de Vidros de Pernambuco, this strategy was opportune because it made it possible to position the company ahead of its competitors. A result which boosted movement in the segment manufacturing glass utilities using IS technology (Individual Section) press-blow technology, and incorporated the research and development model, as a differential factor to improve performance in the process of innovation on account of design.

4. Results – comparing the craftwork and industrial approaches

This article has presented the methodological approaches used by the ***Imaginário*** Laboratory both in the craftwork environment and in the industrial one, underlining the relationship between design and sustainability based on its specificities. The strategies outlined for each productive environment and the way these unfolded have been exemplified using design case studies. While in the craftwork environment, the methodology is rooted in improving the quality of human life, in the industrial environment the focus is the product and the process. The table set out below gives the comparison between the main factors of convergence or dissonance of the methodological approaches.

Factors	Craftwork Environment	Industrial Environment
Focus of the action	Design at the service of improving the quality of life.	Design at the service of improving the quality of the products and productive processes, the satisfaction of the user/ consumer and the market repositioning of the Companies.
Methodological structure	Simultaneous actions anchored in on the axes: management, production, design, market and communication.	Cyclical steps: survey, analysis, synthesis and ongoing monitoring
Interface with other areas of knowledge	Action coordinated among the axes of management, market, production, communication and design based on the needs and planned actions.	Network of partnerships constructed based on the demand of the project, including company departments, the University departments and other companies.
Activities developed	Diagnostic and drawing up the collective project; Conducting capacity-building; Holding workshops; Bibliographical and field surveys; Tests in laboratory; Market survey; Generation of alternatives with community-designers in conjunction Evaluation in the market	Bibliographical surveys Market surveys Survey with users Techniques of analyzing data Generation and selection of alternatives Development and confection of models On-going monitoring of production
Forms of interaction of the team	Weekly meetings with the community Weekly meetings with the laboratory team. Occasional meetings with town halls and or partners	Discussion groups with users Meetings with departments of the company Marketing and production Meetings with other partners
Partnerships	Public institutions, town halls, and non-governmental organizations.	University departments and companies

Authorship of the project for products	The authorship is of the community	The authorship of the project is of the project is of the laboratory

Table 3: Comparison of the methodological approaches of The *Imaginário*

The example of Cabo de Santo Agostinho confirms the possibilities of sustainability coming from the partnerships between the public and the private sectors, as in the example of the partnership entered into with SEBRAE - PE, BNB and COPERGÁS. Allied to this is the capacity of the Pernambuco craftworkers to resist while seeking, in this activity, means to revive their culture and preserve their values. All this effort reflects the concept of sustainable local development, that is, a process of sustainable growth of the social, political, cultural, economic educational and environmental conditions of social groups, based on the raising of individual awareness and taking collective responsibility for undertaking productive local initiatives or not doing so.

In the case of CIV, reducing environmental impacts means contributing to changing users' and consumers' life-styles and therefore, designers can play a great part, although there are few companies, which, in fact integrate design into the definitions of their strategies for their business. This contribution can still be effective when there is a company/client strategy targeting the concepts of eco-efficiency and durability, which, by means of an evaluation of the life cycle of a product (from obtaining the raw material until disposal), balances the environmental implications with the economic factors by means of creative solutions.

The experiences undergone by the *Imaginário* Laboratory team signal the need to use design methodologies, even if they are steered towards solving problems of different natures, as in the examples presented. At the same time, it is important to note that making the methodology suitable for solving the problem is fundamental for the success of the result.

Therefore, understanding the problem by considering the socio-cultural, economic, environmental and productive dimensions is a condition for the good performance of the project and the construction of sustainable models. In this sense, the relationship between academic life and society can contribute significantly to training future professionals, to developing research and to university extension studies which, by means of exchanging experiences, enriches the possibility of finding solutions for the very diverse problems of today's world.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Service Design to foster premium prize and sustainable mobility in urban contexts*

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Abstract

Some of the problems facing present-day urban mobility could be solved by the so called Intelligent Transport System Sector. Thanks to the Electronic Toll Collection (ETC) technology currently used to collect tolls from urban traffic, which is based on Onboard Units endowed with a Smart Card that can communicate with Antennas placed at specific points of transit, it is now possible to introduce a new approach to urban mobility management and imagine a new generation of services.

In this paper we will explain how ETC technology platforms can bring about sustainable scenarios where new positive social behaviours are enabled by service innovation. Presenting the main results of two research-projects on the Italian mobility system, we will describe a vision of future mobility, based on the development of ETC platforms and the adoption of a series of key service elements.

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* This paperi s the result of a collective work, but, for the puroposes of this pubblication, A.Meroni has written the paragraph 3, D. Sangiorgi has written the paragraphs 1-2, G. Simeone has written the paraghraphs 4.1 - 5, B. Villari has written the paragraph 4.2.

1. Problematic background

New services adopting Intelligent Transport System (ITS) technologies could contribute to solve some of the problems of present-day urban mobility (Urry 2004; Dennis and Urry, 2007; Urry, 2007). This paper presents the results of two Service Design projects working on a new generation of mobility services that seek to answer the needs of contemporary urban mobility by stimulating more sustainable social behaviours.

In recent decades people mobility has increased and become less standardised; traditional collective transport services are unable to meet new requirements and individual car-based mobility is no longer sustainable. There is therefore a need for integrated, flexible and hybrid mobility services able to give a wider choice to users while orienting toward more sustainable behaviours. The challenge is to move away from toll-based policies and solutions which are detached from the mobility system and do not provide users with alternatives, to service oriented ones; this paper describes a vision of future mobility that uses Electronic Toll Collection (ETC) technology to make the mobility service system more efficient and enable more aware behaviours. Electronic Toll Collection (ETC) technology is currently used to collect tolls from urban traffic thanks to Onboard Units endowed with Smart Cards that communicate with Antennas placed at specific points of transit. This technology can:

1. help integrate services, promote multimodality and make mobility systems more user accessible;

2. enable a series of mobility-related services providing context aware information and a seamless mobility experience that makes travelling more pleasant and personalised to the needs, expectations and characteristics of the traveller.

This new logic presupposes significant changes in user habits: in order to succeed in a sustainable perspective such innovation in technology must stimulate some kind of social innovation, meaning innovation in the way people act to obtain results. For this to occur, social innovation, which is typically a bottom-up process (Meroni, 2007), needs to be recognised by users as more advantageous than their usual habits. So, the service design challenge is to use ETC technology to facilitate “open” (Cottam and Leadbeater, 2004) mobility services, where the user can actively “arrange” his own solutions and strategies and, in doing so, orient the system.

The two Service Design research projects therefore combined technological and social innovation perspective. On one hand the research projects developed ETC technology as a platform for the implementation of different service elements able to generate integrated, flexible and hybrid mobility solutions (modular architecture); on the other they developed these solutions adopting a “positive psychology” approach that recognises and rewards sustainable behaviours.

2. ETC platform

The current challenge in orienting mobility-related behaviour towards a more sustainable pattern is to create an integrated, flexible and hybrid mobility system able to give users a wider choice, therefore reducing the use of private transport (AA.VV. 1999). Recent innovative technologies, like the ETC systems and electric or light vehicles, combined with an innovative vision of the service, could facilitate the development of such a new system.

ETC technology, currently used to collect tolls from urban traffic, is based on Onboard Units endowed with a Smart Card. This is able to communicate via microwaves with specific points of transit and is currently adopted both for motorway and urban traffic, enabling vehicles to be tolled without having to pass through specific toll plazas or reduce their speed. This benefits the

environment, because it eliminates queues and deters the use of private cars in urban areas if the system is installed in towns (road pricing).

Since it is able to recognise and track the user, ETC technology could be further developed into win-win solutions that encourage and reward sustainable behaviour, such as using public instead of private transport, sharing cars instead of owning them or using green vehicles instead of polluting ones. This is because the technological system is made up of three main components that track the mobility of a person or vehicle: (1) antennas placed at specific points of transit; (2) Onboard Units placed in the vehicles; (3) Smart Cards, generally inserted in the Onboard Unit, that can also be used separately as personal cards to access various public transport, personal and public services. It is therefore possible to profile users and encourage them to adopt virtuous behaviour by providing access to different mobility modes and services, rather than through punishments and constraints, while communicating the impact of each choice and rewarding sustainable ones.

Electric vehicles offer further opportunities for sustainable mobility. Considering the use of electric vehicles in new mobility service ideas was the starting point for the Archimede-Ecomobility research: these kinds of vehicles (cars, microcars, bikes) can be integrated into public and private mobility systems.

3. Key service concepts

This vision considers mobility services as nodes of an integrated and flexible system where people are stimulated to adopt certain behaviours by ease of access to the system, its effectiveness and by premium-prize logic.

In order to do this urban mobility has been rethought in the light of a series of key-service-concepts that, when combined together, complement each other and offer the city-user a brand new range of mobility solutions.

The two main mobility concepts in this vision are:

1_ *mobility credits* using ITS technologies to manage each individual mobility pattern through *fees and rewards*;

2_ *intermodality* through connected inter-change nodes all around the city.

1_ Mobility Credits

Thanks to the ETC technology, it is possible to implement the concept of mobility credits, where the user can buy, spend and gain credits according to his/her behaviour, in the light of a multimodal mobility scenario. A credit is a unit which can be used to access operations inside a given system: ETC technology enables credits to be collected and stored automatically in the Smart Card, which becomes the main means of activating the services. Since the same Smart Card can also be used in the main public transport electronic ticketing devices and, in several cases, even be used to manage car-sharing services, it enables a set of interlinked and sequential actions. The principle of mobility credits is currently being explored in several places and conditions in order to determine the feasibility of such a radical shift in urban mobility behaviour (Fondazione Italiana Accenture, 2006; Kalmaje, Kockelman, 2004).

Adopting a credit system allows us to see mobility services in terms of Positive Psychology (Seligman, 2002; Inghilleri, 2003). That's to say, instead of frustrating the user with prohibitions, services can be designed to reward positive behaviour (with credits) and to provide a clear picture of the available mobility choices. These to overcome the difficulty users have in today multimodal mobility system to understand the alternatives and choose the best solution for his/her needs. A credit-collection based system (exploiting ETC technology) should and could systematically overcome this problem by: 1) providing both an analogical and digital map of the

system (info-mobility and advanced navigation systems); 2) effectively fluidizing transition between the different means of transportation and giving access in real time to real alternatives; 3) rewarding sustainable behaviour and choices (i.e. the adoption of public instead of private transport).

The aim of the two research projects was therefore to turn a series of mobility prohibitions, restrictions and constraints into new opportunities, where limited freedom of use for private vehicles is overcome by a set of real and feasible alternatives. This means adopting a positive approach (Csikszentmihalyi 1991) to restrictions using ITS and green technologies as significant drivers of change.

2_ Intermodality

Both the projects adopted a user-profile oriented approach. An analysis of current lifestyles and ways of moving around in the city suggested the need to shift from the current, apparently more convenient, one-vehicle trip model, to a more expedient multi-vehicle trip model. In the latter scenario, users are asked to exchange apparent convenience for tangible benefits in terms of real time-saving, money-saving and rewards for good practice. The aim of the projects was to create real opportunities for an *intermodality* attitude to kick in as a winning strategy in everyday mobility solutions (Jegou, Manzini, 2003).

The user profile approach resulted in a series of *travel demand models* (Kalmaje, Kockelman, 2004), where destinations, needs and time choices of different *personae* were used to stimulate the design of services with a modular architecture, that's to say, made of "service elements" differently combinable by the user according to the specific situation.

Moving on from these two main concepts, and from real to abstract scenarios, some crossing and transferable key concepts have been explored as promising directions for the mobility sector:

- *mobility credits*: units that can be used for operations inside a given system, which the user can buy, spend and gain according to his/her behaviour;
- *user profile personalisation:* thanks to the use of the smart card, every user can decide how to spend his/her gained mobility credits, choosing the most convenient, personalized service and routes;
- *multimodality in inter-change nodes:* inter-change nodes offer the user the possibility to choose among different mobility services depending on his/her needs and the city mobility conditions;
- *privileged access:* users can benefit from signing up to the system e.g. in gaining access to reserved lanes and specific services and privileges;
- *green shared mobility access:* users can access green vehicles located around the city, using the smart card to activate them;
- *mobility info-points:* mobility info-points can communicate with the OBU, on the car or other means of transport, to provide local mobility information such as real time traffic conditions and the availability of parking spaces;
- *all-inclusive personalization or pay per use:* users can choose between paying a flat rate for all services, or just paying for those actually used per unit of time, according to his/her involvement in the system and willingness to take advantage of the benefits available;
- *integrated mobility in a bounded space:* in a closed environment, like a fair, it is possible to integrate mobility services and access to different facilities to enable a seamless experience and increase efficiency;
- *integrated private and public transport:* technology enables private cars to be used in combination with public transport to form an integrated mobility system. A user can

leave his/her car in an inter-change node and catch a bus or a train to get to his/her final destination. This implies a change in mobility model that integrates and facilitates access to different means of transport;

- *advanced technology integration:* in some contexts it is necessary to integrate some advanced technology such as GPS and GPRS (satelite technologies used to map objects in a wide area) to trace or to map a user's movements in an extensive, open space, such as an alpine environment, where traditional ETC radio frequency is not enough to localise a person;
- *road pricing:* road pricing, traditionally used for motorways, is now becoming a common way to combat the increasing pollution in cities. If considered in a service-oriented perspective, road pricing could be a concrete answer to air pollution problems in contemporary urban environments.

4. Case studies

This vision of future mobility has been developed in two applied research projects by a team of design and engineer researchers from the Poli.design consortium:

- a scenario building exercise for the Norwegian company Q-Free, dealing with ETC technology, aiming to explore new service ideas for the Italian context;
- a product-service-system development for the Italian company Archimede Energia, aiming to provide green mobility services, using electric vehicles plus solar energy provision, for the city of Milan and its hinterland.

The common purpose of these projects was to reduce material and psychological dependency on private vehicles and foster the adoption of multi-modal and inter-modal commuting.

Both projects were interested in developing the concept of *road pricing* (recently introduced in different European cities, among which Milano). Nowadays, road pricing is a way of charging for the use of given roads at certain times and conditions: such a solution lacks flexibility as it charges the same amount of money for different mobility profiles (differentiating tariffs only in relation to the kind of vehicle) and is therefore missing the opportunity of developing into a new generation of urban mobility services.

Combined with ETC technology and with a fleet of green powered vehicles (from cars to bikes) for public use, the road pricing strategy could really foster a new generation of urban mobility services. The service design issue, in such a framework, is how to conceive interconnections between different transport options and make them fluid and accessible for the user, so to provide a positive experience in moving around in town.

In addition, extra mobility benefits and services have been added and integrated within the credit system, so as to make it possible for users to benefit from supporting offers connected to his/her needs and preferences.

4.1 Q-Free: mobility scenarios for the Italian market

Italy was selected as the research context because of the peculiarities of its geo-social conditions: historical cities, small metropoli, areas of natural beauty attracting tourism, mountains and sea.

Firstly, six *metacontexts*, that's to say typologies of emblematic urban or extra-urban settlements with recurring features, were identified as characterising the Italian peninsula from a mobility perspective. Each of them was analysed moving from a real case study:

- the metropolis, Milan;
- its hinterland with trade fair centre , Rho;
- the historic/productive town, Como; the motorway system;
- the skiing area, Alta Val Badia;
- the inhabited natural park, Parco Nazionale delle 5 Terre;
- the motorway system.

While exploring the context, the technological state-of-the-art of the main mobility related functions (paying, access, tracing and tracking) were also examined in order to define the corresponding metafunctions (recurring activities that constitute functional typologies).

With these metacontexts and their related metafunctions in mind, the scenario building activity moved from an awareness of the complexity of contemporary mobility behaviour and from the necessity to work on motivations, rewards and values, to seek ways of stimulating relevant changes in lifestyles. Service design is in fact more and more about designing behaviour and may use technological platforms as significant drivers of change.

As a result of the research work, six scenarios of possible solutions were built:

1) Milan: Providing multimodal possibilities to integrate public and private transportation;
2) Rho-Fiera: Access to organized mobility and fair services for exhibitors;
3) Como: Multimodal mobility system based on the use of green vehicles to access a historic city centre;
4) Alta Badia: Skiing services integration through the ETC system and built-in additional technologies;
5) Parco Nazionale delle 5 Terre transformed into a harbour scenario, where the ETC system is adopted in the marine sector;
6) Motorways: Introduction of the ETC system on the motorway adopting a mobility credits model.

Every scenario used mobility credits to foster a premium prize mobility and stimulate potential users to join the system, changing their behaviour as regards the way of moving around. In some cases the mobility credits gained were used to pay for public transport or shared green vehicles, in others to obtain discounts or benefits from services which have special agreements with the system, and which the user had chosen at the moment of adhesion.

Thanks to mobility credit it is now possible to change attitudes towards more sustainable mobility, not only through deprivation of comfort and materials as commonly perceived, but also by enhancing a system where virtuous users are stimulated to act more sustainably because they have something to gain from good practice. Users are really free to choose between paying and being restricted, or joining the system and being awarded for their positive actions.

In the Qfree Project scenarios, the user can always decide which is the best way for him/her to move. Contrary to the mindset where one is really only free to move when using private cars, thanks to ETC technology, a user can decide to maximise freedom of movement, using all the means available, from private cars, to green shared vehicles and the public transport system, with the maximum of flexibility and reliability. The smart card permits intermodality because it can be separated from the OBU, so the user can keep it with him/herself on all means of transport belonging to the service.

4.2 EcoMobility – Archimede Energia

Ecomobility is a research project focusing on sustainable mobility services for the Milan city context developed in 2007. Three design service scenarios were built, based on the Archimede Energia company and its electric vehicle products. The scenarios focused on the integration of different existing urban mobility services (electric vehicles, car sharing, car renting and so on). In accordance with the Archimede Energia strategies, the Ecomobility research scenarios considered the use of renewable energy for the vehicles (green Km concept) produced by photovoltaic panels.

Starting from the Milano city area, the design scenarios aimed to promote a strategic development of the Archimede enterprise towards a sustainable way of living the city of Milan.

The solutions were structured in service ideas mainly based on offering maps, service scenarios and design concepts for the infrastructures to be adopted.

The research approach was based on the integration of context of use (places, mobility user profiles, actors involved) and innovative services ideas based on ITS technologies.

Some design scenarios were created after a preliminary analysis of existing mobility services and infrastructures situated in the city of Milan. Some ideas were described in depth, merging Archimede enterprise strategies with innovative levels of mobility services, and visualizing the main characteristics as described in the following three scenarios:

1. *Greensharing*. A mobility service integrated with a car-sharing company. It considers the use of electric vehicles with GPS technology. The scenario includes the possibility of:

- programming the route on a website before using the cars;
- using the mobility credit cards and the OBU for the TLZ;
- using special parking areas equipped to recharge the vehicles.

The final solution is a car-sharing service performed by electric microcars (also fuelled by photovoltaic energy) that integrates different technological solutions:

- The *Electronic Toll Collection technology*. The microcar can be 'traced' in order to use Urban Road Charging "mobility credits". The microcar includes an On Board Unit able to identify the user when the Smart Card is inserted;
- *Personal Smart Card.* This activates the vehicles and integrates with public transport and car park services..It also enables the use of Mobility Credits;
- *GPS*. This enables access to internet booking services and route programs. The route programs can also be recorded on the personal GPS;
- *Web Site*. This is the interface for the entire service.

The microcar can be recharged in special car parks provided with charging points, often situated in supermarkets. The service also gives the user access to the city center or special car parks. Thanks to the ETC system, the user can manage his mobility credits and use different mobility services offered in the city of Milan.

The idea is to promote an integrated sustainable mobility system using public transport where users gain credits to spend in future when using the Greensharing service.

2. *Micromobility for Milan neighborhoods*. This is a mobility service offered by local supermarkets. It supports individual users in their daily or weekly shopping at the local markets. The service is part of a widening supermarket offer dedicated to user members. For example, people can rent an electric bike with special baskets for a whole day using also the Supermarket card points.

The service includes electric microcars or bikes available in supermarkets or local shops. The service is supposed to facilitate shopping activities on the one hand and on the other it facilitates short trips around the city. For example the users can rent an electrical bike in the

supermarket park area using their personal card. The vehicles can be charged in the supermarket parking area using the charge points.

3. *Company Fleet*. A mobility service that provides electrical vehicles for small enterprises. The service includes green-energy supply and vehicle maintenance.

This mobility service offer includes:

- electrical vehicles customized for different enterprise activities using the ETC technology and the GPS navigators;
- sustainable energy supply (produced by photovoltaic cells);
- photovoltaic infrastructures;
- smart cards to manage access to the service and other integrated services connected to the city;
- vehicle maintenance and charge points;
- mobility management (access, routes, etc.).

This service could be used to deliver goods or as a home delivery service.

By integrating Electronic Toll Collection the vehicles can also be traced for direct payment of urban road charges.

5. Conclusions and replicability

This vision can contribute to foster sustainable moblity as it is potentially transferable and replicable in different urban contexts, with minor or major adjustments.

Conceived as modular architecture, the key-concepts work as guidelines to develop a set of interlinked service-elements that will constitute the final mobility system. To transfer and implement this vision into different contexts, service designers need to match the set of concepts with the different mobility needs and local habits.

As mobility issues are strictly dependent on contextual needs, but at the same time connected to wider and complex systems and dynamics, design can contribute to *changing the change* by building overall visions and concepts that can orient the development of the overall technological platform and of single situated solutions. Working on the overall technological infrastructure and modular service elements, designers can therefore link the vision with local requirements and mobility profiles, combining technological and social innovation.

This means working both with technology stakeholders potentially able to build the infrastructure, and at the same time with local communities and city councils (Landry, 2000) to translate the vision into effective and useful solutions that motivate changes in mobility habits.

Such a system could, also, foster the development of so-called “local currencies”, represented here by the mobility credits. Local currency enables a community to use its existing resources more fully, which has a catalytic effect on the rest of the local economy. It also enables people to join a system where economic transaction and payment are not a punishment, but a way to use the resources in the best possible way, because of the attribution of a value that is defined within the community itself.

From a designer point of view, these kinds of projects require careful attention to accessibility and usability issues, because of the complexity and flexibility of the system, and a clear communication strategy (transparency) able to effectively show the possible mobility choices as well as the benefits/rewards associated with the use of certain kinds of services. Service design is, in fact, more and more about designing behaviours and can use technological platforms as significant drivers of change (Sangiorgi and Villari, 2006; EMUDE, 2007). The point, is creating solutions that not only satisfy a function or solve a problem, but that are also desirable,

aspirational, compelling and delightful (Burns, Cottam, Vanstone and Winhall, 2006): the way to reach this objective has been the adoption, for both projects of a user-centered approach, where technology has been rethought in the light of the user experience and viewpoint.

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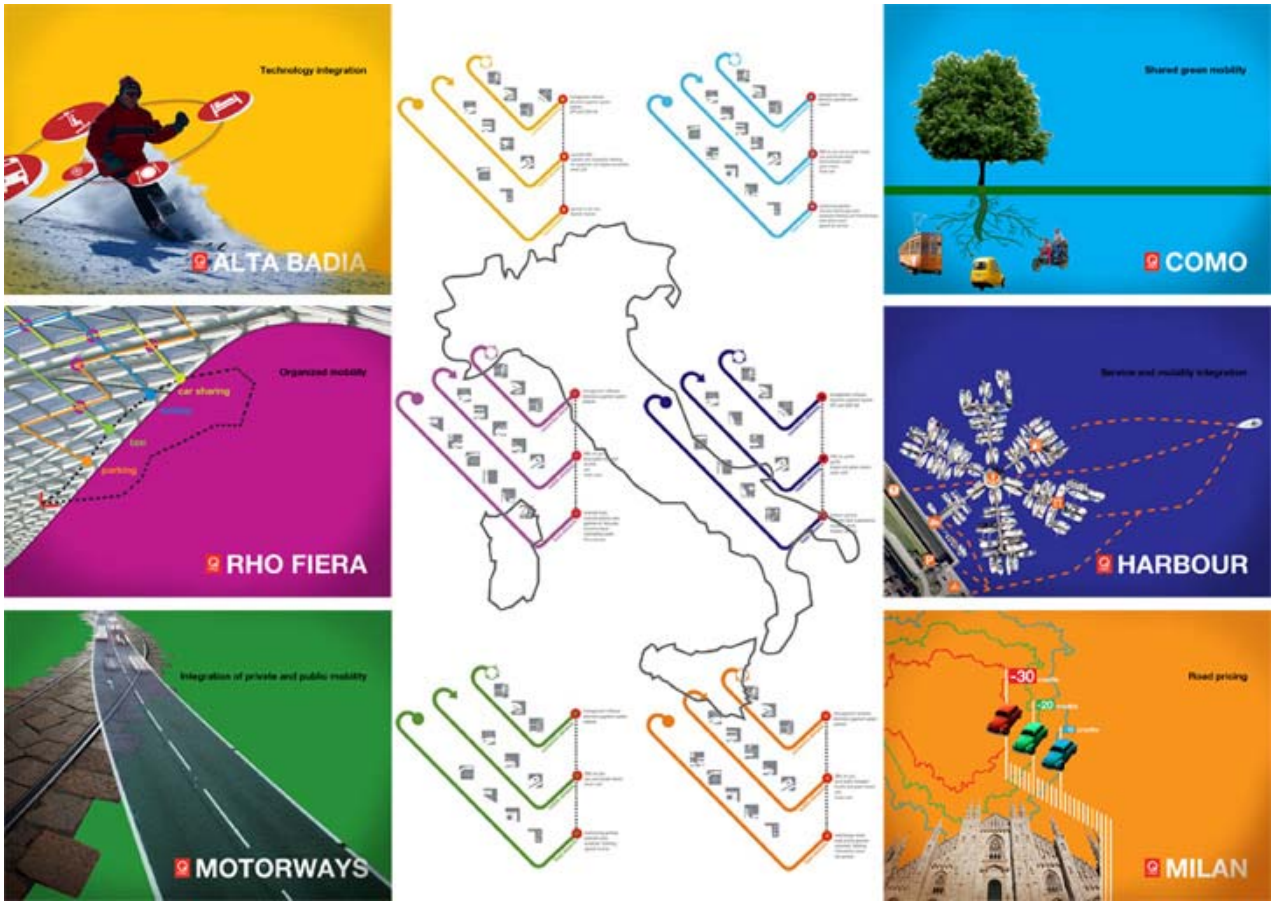

Fig. 1: this picture shows the six Qfree Project scenarios, with the elements needed to implement the system. They are divided into fixed elements, as for infrastructures; mobile, as for vehicles; and communication elements, as for smart card and electronic management system.

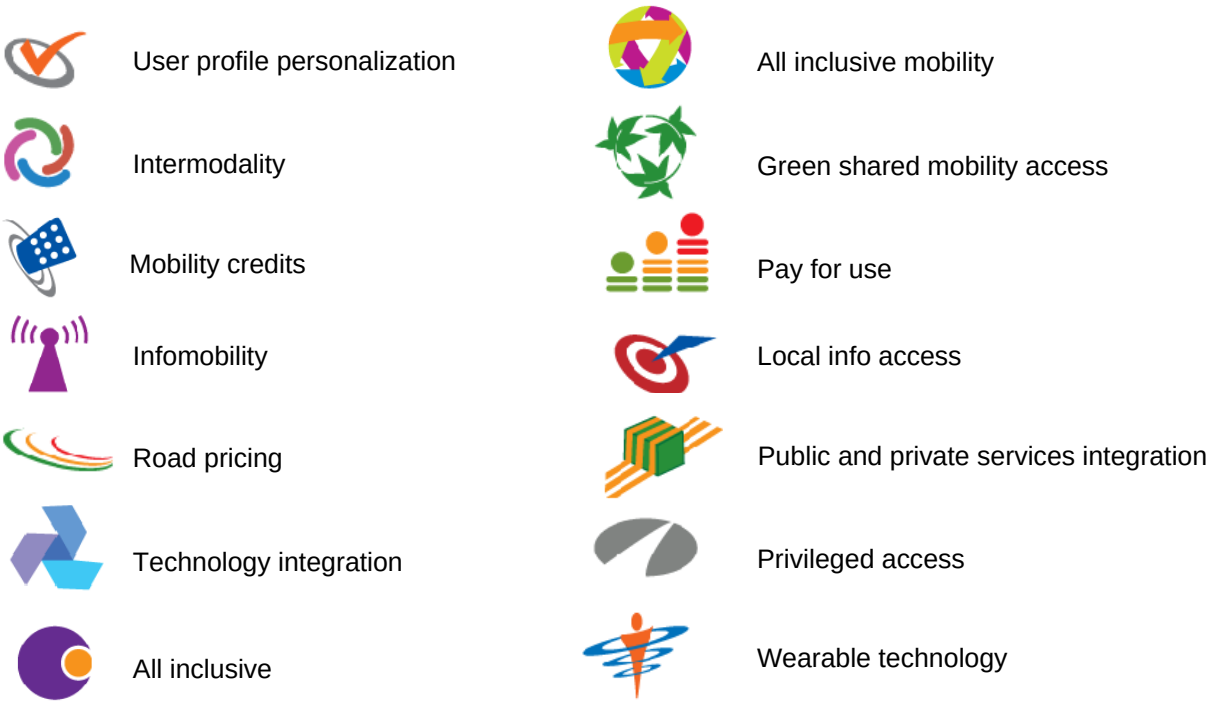

Fig. 2: This is the legenda of Key concepts icons system drawn for Qfree project and available also for Ecomobility.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

ARK-INC

An alternative view of what 'designing for sustainability' might mean

Benedict Singleton[1], Jon Ardern[2]

Abstract

This paper concerns ARK-INC, an ongoing critical service design project that was initiated at the Royal College of Art in 2006. The project explores radical responses to the unsustainability of current infrastructure, economic paradigms, and modes of everyday life through ARK-INC, an organisation that acts to prepare its fee-paying clients for extreme, yet highly plausible, near-future scenarios in which natural resources are diminished, violent weather part of the everyday, and social unrest widespread. The paper suggests new concepts, such as *guerilla infrastructure*, adaptable and resilient means of moving around and bringing together people, things and information; and *dormant technology*, discarded media that might be re-evaluated in light of new, sustainability-based criteria.

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1. Introduction

This paper introduces ARK-INC, an ongoing design and research programme that began life in the Design Interactions department of the Royal College of Art in 2006. The project arose from a sense of frustration: the mounting body of scientific evidence concerning the dangers inherent in continuing with our current lifestyle was (and arguably still is) being ignored or denied for fear of impeding the current economic paradigm. The systems on which familiar ways of life (at least to those in most of the Global North) are contingent are vulnerable to a wide range of stressors, of which *climatic change* and a societal *energy descent* caused by depletion of oil resources are two of the most clearly foreseeable. ARK-INC is a response to this situation, an experiment in envisioning 'sustainability' beyond minimising human behaviour's current detrimental impact on natural systems, to address extreme, yet entirely plausible, near-future scenarios.

Positioning itself as *a radically alternative investment company*, ARK-INC encourages the investment of its fee-paying members' time and money not in ventures projected to yield a fiscal profit, but in developing the skills, contacts, knowledge and equipment appropriate to a near future where natural resources are diminished, violent weather part of the everyday, and social unrest widespread. ARK-INC cultivates and manages a secretive grass-roots network of 'alternative investors' - the 'ARK Movement' - comprised of many semi-autonomous 'Collectives'. The Collectives are groups who have chosen to put aside differences in their political and theological beliefs to take a common stand in developing new, sustainable and (importantly) *resilient* ways of living. ARK-INC supports and shapes the Collectives' endeavours through the products, services and systems it provides. It is also the public face of the Movement, actively recruiting new members and forming partnerships strategic and tactical with other organisations.

ARK-INC's development is a programme of *design research*, practiced from the perspective of artist-designers (Gaver & Dunne, 1997). This approach places less emphasis on strict adherence to a given methodological approach, or on factors such as the 'usability' of designs; instead, it concentrates on opening new spaces for design, exploring how values differing from the mainstream might be embodied in products, services and systems (e.g. Gaver, Dunne & Pacenti, 1999; Dunne & Raby, 2001; Mazé & Redström, 2007). We have been inspired in our approach to this project by recent work such as *SlaveCity*, by Rotterdam-based art and design collective Atelier van Lieshout, and *Edge Town* by British designers Ben Hooker and Shona Kitchen. These very different projects explore the dangers in assuming 'sustainability' to be an *a priori* good (*SlaveCity*), and the role designers might play in creating desirable ways of life in adverse surroundings (*Edge Town*). ARK-INC is, however, predominantly informed by 'real world' material, from scientific writing on global ecologies natural and man-made, to contemporary experiments in alternative living arrangements.

Formally, the ARK project is a *superfiction*, a form of creative practice that blends fiction and real-world structures, presenting organisations, business structures, and the lives of invented individuals as though they were real (Hill, 1997). Superficially this resembles the conceptual design of products and services prevalent in much contemporary design practice. But rather than, for example, being produced as the first stage in the linear process of developing a real-world service, superfictions occupy a more complex and ambiguous position between the fictional and the real. In the case of ARK, the project's superfictional status has allowed it to act as a 'conceptual container' for an ongoing, open-ended series of sub-projects spanning art, interaction design, and academic and other forms of research. The project presents designs for fictional products and services alongside 'real-world' initiatives (for example the ARK-INC website, in whose forums people can discuss the issues ARK-INC is one response to, and ongoing work with the *Phoenix Project* group, a residential experiment in 'post-Crash' living in Northern Scotland) as part of a programmatic whole. To date, this work has entered the public domain in a number of

ways: through installations in galleries and at scientific conferences (e.g. MoMA, 2008; The Tipping Point, 2006), through performance (V&A, 2006), and through written material (e.g. www.ark-inc.info and this paper).

Within ARK-INC, our process has focussed on pragmatic, implementable designs. These designs also serve a critical function, based as they are on a carefully-reasoned departure from mainstream views of 'designing for sustainability'. A second critical dimension is also present in the project, in that we acknowledge - but choose to leave unresolved - the question of whose interests would ultimately be served by the operation of ARK-INC or a similar organisation.

Below, we outline the ARK project, detail some of the products and services ARK-INC provides, and elaborate on more general ideas that have arisen through the research. This paper is not an exhaustive description of the projects which comprise the ARK research programme, nor is its focus on the provision of detailed accounts of the process(es) involved. It is better understood as a piece to encourage reflection and debate, the same end we have sought when presenting ARK-INC through other channels.

2. Sustainability: a perspective

It is surprisingly common, now, to find people asserting that our way of life is unsustainable and must be changed. Yet at the same time, it is striking how many designed responses to this assertion focus on merely *amending* the current paradigm - making familiar practices 'more sustainable', rather than looking for alternatives. An increasingly service-based economy, local sourcing of food and other goods, and extended use of ICT are examples (they have also all been shown to not necessarily decrease adverse impacts on the environment; see Carleston, 2007; Thackara, 2005, respectively).

But: the diminishment of natural resources (especially oil and clean water) and rising levels of pollution; the prospects of resource wars, increasing urban insurgency and unrest, and massive population displacements; stock market instabilities and the sensitivity of agriculture and key infrastructure systems to unanticipated climatic events: all these phenomena threaten the contemporary economic paradigm and familiar modes of everyday life. What is more, they cannot be treated singly, on a case-by-case basis; the test of how 'sustainable' our society actually is would be the interaction of such phenomena in a *convergent catastrophe* (Kunstler, 2005).

To explain: a single network placed under stress becomes, in turn, a source of stress to others with which it intersects; while this has always and everywhere been the case (Delanda, 1997), we live in an era in which our way of life is based on historically new levels of cross-network co-ordination, principally a function of ICT (Homer-Dixon, 2000; Mitchell, 2003). This close interrelation of the systems on which our way of life is based increases the possibility that a single 'shock to the system' creates other shocks in turn. The world's stock markets, from day to day leveraged by faith in economic expansion over terms both short and long, are an exemplar of the mechanisms that serve to distribute shocks across networks.

A convergent catastrophe would be a situation in which multiple simultaneous or closely-spaced events overwhelmed our ability to deal with them. Of these threats, two seem inescapable. Firstly, a key stressor to global systems is climatic change. We must be cautious here about our assertions: a scientific understanding of many of the factors underlying climate change is still relatively rudimentary - the role of stratospheric dynamics and ocean mixing systems, for example, are as-yet poorly understood (Wujdhausen, 2007). But estimations of the rate and severity of global climate change have, of late, routinely exceeded the most pessimistic scientific projections (IPCC, 2007), and the scale, unpredictability, and rapid onset of extreme weather events - especially in hitherto "safe" locales - already confounds our attempts to deal with them. Secondly, although predictions vary as to when and how quickly it will occur, we will at some point enter a state of *energy descent*, caused by the increasing scarcity of easily-extracted oil. Despite gains in the efficiency of alternate energy sources, their status as a viable global

alternative to carbon-based energy systems is yet to be achieved, and expansion of nuclear programmes is costly (and incredibly energy intensive in itself) and creates its own risks (e.g. see Kunstler, 2005).

Two main factors tend to inhibit our ability to apprehend the likelihood of a convergent-crash scenario (which from this point on, in the interests of brevity, will be called *the Crash*). Both are socio-psychological.

First: the seductive appeal of apocalyptic predictions themselves. When possible Crash scenarios are presented through a mixture of cinematic and quasi-religious imagery as awesome spectacles of destruction, we are denied - or better, *absolved of* - responsibility for engaging with them. We dismiss such events as implausible (particularly easy given their religious or science-fictional overtones), fear them, even find them secretly thrilling - perhaps all at the same time (Institute for Public Policy Research, 2006, 2007). But we do not feel the need to prepare for them. Presenting them as both awesome and inevitable generally leaves people, at best, with "...the attitude that if it rains, it rains, if the world ends, the world ends" (Thackara, 1995).

Second: as philosopher Ivan Illich has argued, established institutions tend to frame social issues as best solved by further investment in what they already do (e.g. Illich, 1973). So amongst the proposed responses to climate change, for example, we find 'technologists' suggesting huge interventions like lacing the atmosphere with certain aerosols to cool the planet through 'global dimming' (e.g. Brahic, 2007); many in the business press advocate a laissez-faire approach, trusting that the invisible hand of the market will craft our solutions for us; and so forth (IPPR, 2006).

ARK-INC acknowledges the immediate necessity of *actively* exploring responses to a potential Crash situation. The organisation takes a pragmatic approach to what it sees as a fundamentally unstable, unsustainable current state of affairs - it reasons that *a disaster is not an event, but the effect that event has*. As Thomas Homer-Dixon has observed, "[k]eeping breakdown from becoming catastrophic means making our technologies, economies and communities more resilient... being ready means preparing today for breakdown tomorrow" (Homer-Dixon, 2006: 3). This could be described as a change in the dominant metaphor used when considering 'sustainability' away from that of *David and Goliath* - i.e. that we might prevail through faith, luck or as-yet unknown resources against overwhelming odds - to that of *Noah*, a more pragmatic perspective: let's consider the odds to have already been decided, and not in our favour. ARK-INC's remit is to develop a social organisation, furnished with appropriate technology and systems, which practices a way of life that *will not change as the world does*.

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3. ARK-INC

Fig. 1: ARK-INC logotype

Our inability to predict the specifics of a Crash scenario requires us to take a broad approach to this process of preparation (Taleb, 2007). ARK-INC positions itself as a radically different form of *investment company*. Clearly, 'investment' refers to the practice of saving assets or otherwise deferring them for later consumption. In conventional practice, this means investing money in ventures which are projected to grow, in the interest of gaining future (financial) returns. But given the potential disruptions to the contemporary socio-economic paradigm, we must appreciate that what is valuable now may not be valuable at all in the future. Technically, this relates to an understanding of the *extrinsic value* of investments. Simply described, the extrinsic value of an object or action is its value determined *in relation to its surroundings* (Lewis, 1983). A banknote's value is almost purely extrinsic: if its value is not *agreed upon* by a social group, it is no more or less valuable than a piece of paper of the same size, printed with any design (its *intrinsic* value - its value as a material thing, independent of the social situation in which it is embedded).

ARK-INC's approach to 'investment', then, sees no value in investing in objects and actions that have a high extrinsic value now (money, cars) that they cannot be expected to retain in a 'post-Crash' world. ARK-INC's alternative strategy is to direct 'investment' into the development of knowledge and equipment that are predicted to have a high extrinsic value in future. This subverted analogy to current investment practices makes clear the relationship between ARK-INC and its fee-paying members: through ARK-INC, the latter develop a *portfolio* of investments that will hold, even gain, value as the systems on which the current paradigm is based creak and begin to crumble.

Structurally, ARK-INC is comprised of a number of anonymous members, a mixture of invited representatives from amongst the Collectives, strategists, advisors and key funders. The organisation's principle functions are:

01 to consolidate the *ARK Movement* - the sum of ARK-INC's members - making key decisions regarding the Movement's structure, goals, strategy and operations

02 to integrate, and act as intermediaries between grass-roots organisations committed to changing their way of life away from the current paradigm: *the Collectives*;

03 to act as an interface between the Movement and the public;

04 to provide products and services that aid ARK members' transition to a post-Crash scenario;

The Movement, the Collectives, and ARK-INC's involvement with them, are explained in detail below.

4. The ARK Movement and the ARK Collectives

There already exists a 'proto-movement' of groups who acknowledge the likelihood of massive global disruption in the near future, from online communities like *www.gaia.com* to fringe political groups and survivalist cadres; in a quieter way, many small, globally dispersed initiatives are underway that seek alternatives to 'the current way of doing things', experiments in more sustainable ways of life with little in the way of rhetoric or expansive ambition (Meroni, 2008). The virtues of sharing knowledge between such groups is clear; but there are ideological gulfs between them, and their most effective actions are often not global in import but reactive to local physical and social conditions. This is an issue of *scaleability*, a recognition that the potentially compatible aims of these groups, achievement of which may be aided by co-operation, co-exist with tensions concerning the self-determined meaning of their operations.

ARK-INC approaches this problem by consolidating groups into a coherent yet heterogenous *meshwork* (Delanda, 1997, 2006), the Movement, of semi-autonomous Collectives. Historically, this model has proven effective at linking groups who may otherwise exist in a state of tension, and at producing action reflexively shaped by local conditions. Organisations that have effectively adopted such a model have proven their resilience and effectiveness in many areas: from the Freemasons and similar societies, to the devotees of non-mainstream religious, sexual and recreational practices; criminal cartels; and cells of political dissidents committed to insurgency both peaceful and violent ('terrorists'/'freedom fighters') in nature. As philosopher John Gray has observed, social structures of this kind (distributed, largely autonomous, inconspicuous, etc.) is not only well suited to direct, locally reflexive, and pragmatic action, but fits well with a contemporary mindset shaped by global migration, communications technology, and the co-existence of differing belief systems both within the overarching organisation, and between the organisation and the wider community within which it operates (Gray, 2003).

Modelled on historical and contemporary examples of social networks of this kind, the Collectives have the following features:

Diverse: Specific beliefs and motivations for participating in the ARK Movement vary

across the Collectives, and even within them: alliances within and between Collectives may be imbued with cameraderie, but as a general rule are pragmatic. Some Collectives are small and loosely, if at all, hierarchised; others are much larger and more formally structured.

Distributed: Each Collective is located in a particular geographic area, affording face-to-face interaction and co-operation (transfer of skills and resources, collaboration on projects, etc.). However the day-to-day proximity of members of a Collective, and the frequency and nature of their meetings, vary widely between Collectives.

Semi-autonomous: The nature, style and motivations for inter-Collective communications and meetings depend on the circumstances and inclinations of the Collectives concerned.

Inconspicuous: The Collectives are inconspicuous, existing out of the public eye: they do not discuss their activities widely. They meet and pursue their agendas covertly, avoiding the pressure brought by the public eye. This preserves their actions from interference, something especially important given the disparity between the Movement's ideals and the values held by the mainstream culture in which they are embedded. All new members are signed up to ARK under a non-disclosure agreement, legalising this inconspicuousness.

Effective: their localised, largely autonomous nature and inconspicuousness allows the Collectives the flexibility to develop responses to local circumstances. Of course, the ideas and practices a Collective develops may be of use to other Collectives, and ARK-INC encourages the dissemination of commentary on both the success and failure of these initiatives more widely in the Movement.

Resilient: This inconspicuousness gives the Collectives resilience, and secrecy consolidates commitment. As resistance movements around the world have shown, inconspicuousness is the key to surviving adverse social upheaval. In less difficult times, the freedom of each Collective to pursue its own goals by the means it selects makes the Movement as a whole resilient, reducing friction within it.

ARK-INC recruits both groups and individuals on the behalf of the Movement. Individual recruits are aided by ARK-INC in the process of integration into an appropriate existing Collective. If this is not possible, the organisation supports individuals founding a new Collective. ARK-INC both responds to interest displayed by other parties - i.e. those who seek out the organisation with the pre-formed intention of joining it - and also actively approaches existing 'groups of interest' with the aim of incorporating them within the Movement (or, should this be inappropriate, to create strategic and tactical alliances with them). In both cases, ARK-INC carefully screens applicants to ensure the Movement is not infiltrated by actively disruptive elements. Membership fees are charged monthly; most forms of payment are accepted.

5. ARK-INC Products and Services

Aside from maintaining the tools that constitute the ARK Movement's 'public face' (for example, its website), ARK-INC's products and services are developed for exclusive use by its members. Some of the most important of these are discussed below, together with a commentary on ARK-INC's approach to the development of products and systems that meet its standards of sustainability.

Guerilla infrastructure

The principle form of *system* that ARK-INC is interested in developing is *guerilla infrastructure*: adaptable and resilient means of moving around and bringing together people, things and information. These systems require little capital investment to create or maintain - generally, they are brought into being through 'unoffical' processes of invention and implementation, by small groups of like-minded people acting outside the explicit sanction of civic or corporate authority. They also tend to be based in the appropriation of existing structures, and thus be minimally detrimental to the environment, often a consequence of their prudent use of resources rather than through deliberate choice (Meroni, 2008).

A good example is *Feral Trade* (www.feraltrade.org), a real-world service that globally moves small quantities of goods by harnessing social networks. Email and text messages are used to co-ordinate the delivery of goods by volunteer participants (*feral trade couriers*) from producers to receivers through existing but underused channels, such as excess space in hand luggage, personally-owned cars already driving long distances for other reasons, and other 'excess capacity' in existing transport. The *Feral Trade* website automatically generates appropriate shipping documents. This network has little environmental impact on its own, although it might be argued that the transport infrastructure to which feral trade parasitically attaches are themselves unsustainable. But feral trade, and other examples of guerilla infrastructure (for example the unofficial credit transfer service *sente*; Chipchase, 2006) share qualities of pragmatism, resourcefulness and resilience that ARK-INC embraces; their 'unofficial' nature also fits well with ARK-INC's emphasis on the low profile of the Collectives and their actions.

ARKNET

During the early phases of the Movement's growth, the provision of a *guerilla infrastructure communications network*, both secure and sustainable, has been of paramount importance. ARKNET is an encrypted global communications network based on a *packet radio* protocol. Packet radio uses the SW radio frequency to transmit binary data; it is so called because it applies packet switching to route messages across the network, in a similar way to the Internet. In fact, packet radio predates the Internet, but its comparatively slow transmission speeds (up to around 7.5 kb/s) mean it is typically used today for low-volume communications, for example transmitting ships' positions (Tucson Amateur Packet Radio Society, 2007). Despite its slow connection speed, and the sensitivity of SW transmissions to the interaction between climate conditions and geographical features, when used as a transmission medium for binary data, the SW spectrum becomes the transmissions medium for *a global free WiFi network*.

ARKNET is accessed through two ARK-INC products. The first is a high-capacity portable USB 2.0 Flash drive. This, the ARK DRIVE, contains plentiful room for data storage alongside an integrated software suite, the ARK OS, an operating system based on the open-source Linux protocol. Plugged into any computer with a USB 2.0 port, ARK OS runs without the installation of software (this use of a limited-function 'external operating system' is made possible by the high data transfer rates available through the USB 2.0 protocol), a parasite that leaves minimal traces on the host system. Users of the ARK OS must enter their ARK ID and 16-digit alphanumeric password, as well as answer three questions from a list of personal information (mother's maiden name, etc.) given to ARK-INC on joining the Movement. As an additional security measure, members must run ARK OS at least once per week, or an automatic secure delete system locks data held on the ARK DRIVE and the member must apply for a new ID through the ARK-INC website.

To access ARKNET, the ARK OS must be used with the ARK RADIO, a shortwave radio transceiver. A cursory examination suggests the RADIO to be a moderately high-end consumer product, one that would not appear out of place in a typical domestic setting, and its does indeed function as a conventional radio. But the ARK RADIO has an additional, latent set of capabilities accessible to the ARK member who owns it. These functions are unlocked by insertion of one of a number of keys into slots along its side; one key, for example, switches the RADIO to receive the PARADIGM INDEX broadcast (described below). But its principle function to ARK members, on insertion of another key, is to switch to SW transceiver mode and wirelessly link to a nearby ARK DRIVE; streaming data to and from the RADIO transceiver, the ARK member is able to create an uplink with ARKNET.

Fig. 2: using ARK RADIO: film still.

ARKNET supports two types of transmission, both accessed through the ARK OS. Firstly, it allows live ASCII messaging (similar to Internet Rely Chat systems) between members of the ARK Movement, with a further ability to leave messages on the system until the target recipient logs onto the network (like a limited form of email). This supports intra- and inter-Collective communication.

Secondly, when an ARKNET link is activated, a more-or-less continuous stream of data is passed between the host computer and other live ARKNET users (as in P2P software systems). This data comprises a body of *useful knowledge* submitted to the system by ARK members via ARK OS, collated and edited by ARK-INC for appropriateness of subject matter, readability, etc. Information deemed 'useful' ranges from reports of events and general conditions in areas where Collectives are based, to how-to manuals dealing with a wide range of situations - from the results of experiments in the creation of local guerilla infrastructure to established knowledge concerning, for example, water purification and emergency dentistry. This is an updated form of community-generated knowledge-building with a long historical pedigree, from the *Whole Earth Catalogue* (Brand, 1968) and the texts collected at www.textfiles.com/survival to 'field manuals' such as the *SAS Survival Handbook* (Wiseman, 1986) and the volumes produced and distributed by anarchist 'ex-worker's collective' CrimethInc (e.g. CrimethInc, 2004). This data is stored on the

individual member's ARK DRIVE, and can be accessed using ARK OS without being on ARKNET.

It is also possible to listen to the robot-like crackle and beep of ARKNET transmissions as audio through the ARK RADIO. Some members find comfort in this; while it would sound to a non-member like barely-structured noise, ARK members understand it as an abstraction of their community's voice as it talks to itself.

ARK-INC, dormant technology and latent functionality

The products that act together to make access to ARKNET possible also illustrate the application of ARK-INC's alternative view of 'investment' to the design of objects. Packet radio is generally regarded as an obsolete communications medium, largely kept alive by committed enthusiasts operating at the fringe of the amateur radio scene. It is an example of what novelist and design commentator Bruce Sterling has called *dead media*, technological systems that failed to be widely adopted, due to an initial overestimation of their virtues, or out-competition by rival systems (see www.deadmedia.org).

ARK-INC prefers to see some of these technologies as *dormant* rather than 'dead'. Within the late capitalist system, technologies such as packet radio were supplanted by newer, faster, more capable and - generally speaking - more energy-intensive, less sustainable alternatives (i.e. packet radio was 'out-competed' by the Internet). These technologies need to be re-evaluated in light of future scenarios, their potential re-discovered - a function of ARK-INC's general programme of critiquing current-versus-projected-future extrinsic value. Of course, the same holds true of current and emerging technologies; ARK-INC does not propose a historical reversal, but a consistent *system of evaluating value* in respect to a projected future scenario, with the general consequence that the products and services it provides are based on a wide range of media.

This idea of 'dormancy' in relation to ARK's development of technological systems has another dimension, one better described, perhaps, as *latent functionality*. They are tools based in a new paradigm of everyday life, and in preparation for it. But ARK-INC does not overlook their existence within the *current* paradigm, where they also must 'fit in'. The ARK RADIO illustrates this design principle well: it appears to be, and can act as, a conventional radio, blending with the contemporary background of consumer products, while at the same time concealing a *latent function* - its role as a gateway to the ARKNET network. This dual status accords to ARK's emphasis on the inconspicuousness of its members' and Collectives' involvement in the Movement; it also gives the product a kind of *cross-paradigm value*, having worth both now and in the future paradigm ARK members are preparing for. This point is explored in more depth in the penultimate section of this paper, *ARK Aesthetics*, but before discussing this in more detail, we will describe some of the services and products developed by ARK-INC that are more focussed on supporting *reflection* by its members than their attainment of pragmatic goals.

Reflective tools and pre-adjustment services

Fig. 3: Near-future London: conceptual advertisement for DISASTER TOURISM

Individuals' adoption of sustainable practices is made more desirable to them by critical reflection on the world around them, something that ARK-INC recognises and helps to guide. The most direct way it does so is through its insistence that new members conduct a PERSONAL INVENTORY of their current lifestyle, and plan how they need to change it. This is an extended and private process of reflection, supported by critical prompts and props developed and provided by ARK-INC, contained in the ARKBOX: a locked container given the new members containing tools that allow access to ARK-INC's core services, including the ARK RADIO and ARK DRIVE whose functions are discussed above.

More 'ongoing' reflection by members on the urgency of changing their way of life is supported by the PARADIGM INDEX (P-Index). The P-Index uses automated algorithms to search for and collect relevant data on 'how well the world is doing'; oil prices, global population, mean pollutant levels, prevalence of communicable diseases, and important events (accidents, civil unrest) collected and distributed at frequent intervals, producing graphed data within ARK OS, and broadcast in verbal form by a computer-generated voice hourly on ARK RADIO. This system's ancestors include Poodwaddle.com's *World* and *Earth Clocks* (www.poodwaddle.com/clocks2.htm) and the *Global Disaster Alert and Co-ordination System* (www.gdacs.org). The P-Index provides a consistent reminder to ARK members that their commitment to changing their way of life is a necessity, not an option; by starkly portraying the global situation, it also reinforces members' sense of achievement at rising to meet this challenge.

ARK-INC also provides *pre-adjustment services*, more structured means of support and training for individual ARK members and Collectives. For example, in order to adjust to landscapes that may unfortunately become much more familiar to us all, the DISASTER TOURISM service organises holidays in apocalyptic locations - areas ravaged by disaster natural and man-made.

An example is the Zone of Alienation around the ex-city of Chernobyl in the Northern Ukraine, evacuated after the nuclear disaster of 1986, but now largely safe to visit, at least for short periods. Already, companies offer tours of the Zone that promise to 'intellectually equip,

practically train and psychologically empower you to successfully survive contemporary contamination incidents' (Pripyat.com, 2008). As ARK-INC's focus is not on survival alone, we are exploring how such an idea might be extended, particularly so that disaster tourists might learn from the current residents of the Zone. These *samosely* ("self-settlers"), often drawn from more comfortable surroundings by adverse personal circumstances (desertion from the armed forces, escape from prison, religious persecution) are beginning to forge a living in the abandoned urban areas. Excursions into these kinds of environments make tangible otherwise difficult to imagine living conditions; and through gaining competence in doing so, ARK members can be both reassured of their capabilities and be better prepared for extreme near-future scenarios.

Closer to home, ARK-INC draws on information provided by ARKNET users to develop and publish *field manuals*, short programmes of self-training in 'survival/prosperity' methods produced in rugged pocket-size book form. These manuals deal with physical and psychological preparation for Crash-style events, and contain exercises that can be carried out in relatively common urban and countryside areas. These include bartering, using one's sexuality as a 'means of persuasion', hunting and trapping and exploring the disparity between the current and potential future value of common household items.

6. ARK aesthetics

Key to ARK-INC's short and long term success is an awareness of its *appeal* to current and prospective members, an acute awareness of its own position within wider social trends - of which the increasing valorisation of 'sustainable' practices is only one dimension. Space does not here permit an extensive discussion of ARK's situation with respect to the potential function(s) of design within, for example, a risk society (Beck, 1992), an anxiety-ridden 'therapeutic culture' (Füredi, 2005), or a popular contemporary desire to engage in voluntary risk-taking, the practice Stephen Lyng (1990, 2004) calls 'edgework'. But ARK-INC's (self-)development is based in large part in acknowledgment and manipulation of what, to borrow a phrase from Philip Tabor (1995), might be called its *less reasoned appeal* - the kinds of qualities readily understood by advertisers, marketers, and politicians.

Why should people engage with sustainable systems or services? They may 'make sense' on a a practical level. But their benefits are hypothetical and generalised to 'society at large'. Appeals to common sense, civic duty or the common good fail to engage most people (IPPR, 2007); this is because they are boring. To fit more effectively into the social-industrial landscape, ARK needs to appreciate its own *less reasoned* appeal - the kinds of qualities readily understood by, for example, advertisers, marketers and politicians. While design research typically steers away from aesthetics - too subjective, ephemeral, complex and contingent - an informed *appreciation* of them at least is, for ARK-INC's purposes, essential. An example is the *durability* of ARK-INC's products. Based in sheer practicality, this ruggedness nonetheless can also be used to situate them within a class of contemporary luxury goods - the GM Hummer, Porsche Design's wind-up outdoors radio (Porsche Design, 2007), and Durabook's magnesium alloy-encased, eminently consumable laptops - sleek, expensive, and meeting US military standard specifications for ruggedness (Durabook, 2007). Another aesthetic aspect of which ARK-INC is acutely aware is its secrecy and potential capacity to be interpreted as subversive: again, a pragmatic initiative that can be 'played upon', amplified for affect (a quality of *inconspicuous consumption* a concept one of us has elaborated upon elsewhere; Singleton, 2007).

Central to the design of ARK-INC's products and services is a consideration of the multiple meanings that interactions with them may have or accrue. They may be thrilling, comforting, anxiety-provoking, even strangely nostalgic, in its appropriation of dormant technology. The organisation does not attempt to enforce one, or a given few, qualities such as these through the design of a particular artefact, but does seek to support their co-existence. An example is the ability to listen to the ARK Movement's abstracted voice through the ARK RADIO;

a byproduct of the technology used, without any strict utilitarian value, ARK-INC nevertheless recognises that such functions are important. The organisation is attempting to offer a *way of life*, and life is not purely utilitarian, even under the terrific adversity of a Crash scenario.

7. Conclusions and future directions

This paper does not propose that ARK-INC represents the only, or even the best, approach to the issues at hand. This is not its intention: for all the pragmatism avowed within it, it is also a critical endeavour. The process undertaken in the research programme demonstrates the extent to which 'sustainability' is a flexible cultural construct, not a given, and the need to take a critical approach to both the projected ends 'sustainable design' seeks, and the means by which it endeavours to arrive at them.

ARK-INC is a platform for a diverse set of future initiatives. In keeping with the project's superfictional status, these encompass both conceptual work and more direct interventions. In the latter category, we are working to create partnerships of different kinds with other groups and organisations whose own agendas intersect with ARK-INC's worldview. Amongst these is the *Phoenix Project* (formally the *Utopia Experiment*), based in Northern Scotland - an ongoing, community-based experiment in self-sustainable living (www.jonardern.com/phoenix/ [beta site]). Such experiments link directly with the concerns of the ARK project, and ultimately ARK aims to be in a position to both inform and be informed by them.

The conceptual side of the project provides a rich space for exploration. The practicalities of systems such as ARKNET are being investigated through hands-on, technological experimentation, and we are exploring how an ARKNET-like system might be coupled with other types of guerilla infrastructure. The potential of 'dormant tech' and 'latent functionality' are likewise being explored through a mixture of conceptual and actual design work. More conventionally-academic research is being undertaken into the *cultural position* of an organisation like ARK-INC, and in deepening an understanding of how economic ideas might inform alternative design strategies, based on projected fluctuations of extrinsic value.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design for the Majority

Designers (Collaborators) As Enablers Of Social Entrepreneurship And Sustainable Product Development

Leslie Speer[1]

Abstract

This paper shares a proposed set of guidelines for designers working independently or within a corporation that will aid them in practising new methodologies and approaches to design that will enable sustainable development in emerging regions. These will be tools that any designer working on developing a product, experience or service for an emerging market will be able to employ. By creating responsible and collaborative methods that are reactive to our current ecological crisis, sensitive to the capabilities of developing regions, and respectful of the inherent knowledge and experience in different cultures, our profession will leap forward into the future in a socially, environmentally, and culturally responsible manner. These methods envision and enable economic independence for all involved.

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1. Introduction

"We are all designers now."

–John Thakara, 2005

Today there is an emerging need for design to step back and reassess its role and purpose in the new product development process, especially in regards to sustainable strategies for emerging (developing) regions and markets across the globe. With roughly 5 billion people on the planet that are slowly gaining economic independence (Prahalad 2005, 147-168), how will designers trained in the methods derived from the Industrial Revolution have to refocus and retrain in order to be in step with the new world that is unfolding? If the consumerist world continues to grow, how will design and the earth's resources respond and cope? What will this new world that designer's take an active role in look like? These are some questions that will be addressed in this paper and for which a vision of the future will be proposed.

For the last fifteen years the author has been conducting extensive design research and work in rural areas of Mexico and Central and South America. This research has involved immersion in multiple artisan communities and directly working with cultural institutions, NGO's, professional guilds, local government and businesses, along with non-profit collaborators. The methods used in the research involve ethnographic tools developed by designers, strategy models used in the micro-lending realm, and opportunity qualification models used by some of the world's leaders in business and manufacturing.

Stakeholder analysis (conducting interviews and surveys), ethnographic observation (recording of typical daily methods and habits in the home and at work), empathic research (living within the community for weeks at a time, usually with a local family), eco-system research (working with local industry and community groups), and partaking in storytelling traditions in the community are some of the tools used in the research. These tools and methods have provided information and, after analysis, given the author and the artisans directions that produce results that have aided artisans and product developers in rural regions to become more economically sustainable.

As a point of comparison this research methodology is now being extended to rural craft based villages in Western China through a project with a faculty member of Fudan University in Shanghai, China. Similar methods used in Mexico are being used to understand these creative communities and how they have existed for centuries and how they have been changing over the last decade. The research will lead to insights into the needs and desires of people in these regions and will provide the author a comparative volume of information to aid in understanding the region.

Through a discussion about methods and tools that the author has used over the years in Latin America, about ways in which entry into a developing market needs to be analyzed, about new ways of collaboration, and most importantly about new types of collaborators, this paper will show that there are ways in which designers can harness their knowledge, new methodologies, and skills to work with the developing world in a mutually beneficial manner. Relearning and familiarising ourselves with the types of "appropriate technologies" that have been employed for centuries, along with incorporation of "human labor" and newer distributed fabrication technologies may lead our profession into a new, more sustainably oriented era.

2. Emerging (Developing) Markets

> "The Industrial Revolution made people more than 100 times more productive. People, capital and technology were scarce. What were abundant were resources and places to put to waste. Now we have abundant people and scarce nature. It makes sense to make natural resources 10 or 100 times more productive."
>
> *– Amory Lovins, Rocky Mountain Institute*

What is an emerging market? There is not a universally accepted definition, but on a scale from developed countries (United States, many countries in the European Union, Australia and Canada) to underdeveloped countries (many countries in Africa and South America, Central America, and many countries in Asia), emerging markets fall somewhere in between.

Emerging markets are defined by having three aspects to their economy:

- As is supported by Arnold (1998, 8-10), Prahalad (2005, 85) and the United Nations, the first aspect is the emerging level of economic development, usually indicated by the average GDP per capita, or the relative balance of agrarian and industrial/commercial activity. **Only 800 million of the world population of 6.5 billion live in developed countries.**

- Second is the expectation that an emerging market is enjoying a growth rate that is attractive to an investor. Most emerging markets have an average **annual GDP growth of more than 5%**, and sometimes 10%.

- Third is a system of market governance and the extent and stability of a free-market system; if the country is in the process of economic liberalization from a command economy, it is sometimes defined as a "transitional economy". This can be assessed by looking at national investment risk indices that have been compiled by business information organizations such as The Economist Intelligence Unit (EIU) and Control Risk. (Arnold 1998, 12)

The diagram below represents the world's population separated into its respective levels of income, showing fully 5+ billion people earning less than the equivalent of $9K USD per annum. Fully 2.7 billion of that 5+ billion earn less than $4K per annum; often this is equivalent to less than $10USD per day. Today, the number of people in the upper class – the 475 wealthiest

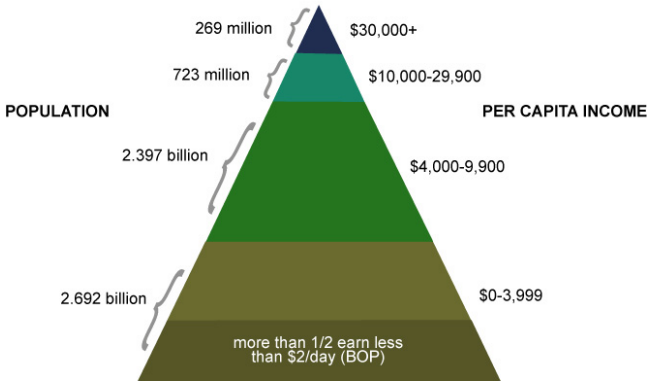

Fig. 1: Global Population/Per Capita Income (Prahalad 2005, 78)

people on the planet who are worth more than the collective incomes of the poorest 20% of the population on the planet, about 1.3 billion people (IFG, International Forum on Globalization, and the United Nations) is shrinking and the number of people in the middle to lower classes is growing.

Why would a designer from a developed country need to know this sort of stuff? As we are educated in today's westernized academic world, we are taught about how to succeed in a world filled with opportunities to work for or be hired by any one of 500 or so multi-national corporations around the world. However these companies only supply products and services to about 10-15% of the global population. What about the other 85-90% of the global population? Who serves them? And by this definition, aren't they the majority? It is true, 85-90% of the global population is not aided by or serviced by any product that the author or most of the other designers in the world ever work on. This should change, but how can this change and how can the design profession be a leader in bridging this huge gap?

Looking inwards to one's own entrepreneurial spirit is the first step in moving towards a collaborative and sustainable future, and a future in which the majority of the people on our planet are better served. Determining if a region is viable for collaboration is the first step, as being able to have an environment that is conducive to change and collaboration is of the utmost importance. Evaluating a region as an emerging market also takes a bit more than what standard business practices require. A SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) is a start, but isn't enough (Prahalad 2005, 68). More information is needed to determine if entering a region is even advisable. In many parts of the world there is extreme unrest (wars, tribal conflict, corruption) along with a severe lack of basic infrastructure (running water, electricity, roads) that are caused by situations outside of a designers' sphere of influence. It is still possible to work in these regions, it is however, more than ever, important to understand *what* situation one is walking into. A more robust analysis can be obtained by using the Five (or Six) Force Analysis developed by Michael Porter – by engaging in evaluation of competition, new entrants, end users/buyers, suppliers, substitutes, and complementary products/the government/the public (Porter 1998, 32). Using the Five Force Analysis will give the designer and entrepreneur a window through which to look through and to understand how the region operates, before even going there. Other facts are also important to know including literacy rates, influx of communication technologies into the region, women's roles in the community and in the family, recent government election results, and other "softer" information that is often very difficult to source, especially if it is in a foreign language.

However, it is here that the Internet's role becomes a very important resource in the start of qualification of a region. Looking at regional publications and news and being able to translate it from afar is key. Working with translators as collaborators once one is "in country" is vital. Additionally it is here that the designer starts to understand that working alone on a new product development project is no longer possible. Collaboration is key, and whom one collaborates with will determine the success or failure of the project. For decades the field of architecture has utilized co-design methods that incorporate the community into the design process (Day and Parnell 2003, 17-19). Some likely collaborators on a typical design for a developing region have been documented by the company Kickstart in their own company website. Started in 1991 by Martin Fisher and Nick Moon as an NGO, over the last 15 years it has grown it into a business that develops new products based on appropriate technologies that can utilize materials, labor, and manufacturing that is local. They train the manufacturing workforce, market the technologies, and subsequently have grown it into a business that helps to start over 800 new business a month, provides $41M in wages and new profits each year, and has revenues that are equivalent to more than 0.5% of Kenya's GDP.

The secret to this sort of success is being able to evaluate a region, talk with people in the area, listen to their needs, see how they have solved other problems successfully on their own, and then be able to problem solve and discover new opportunities for a community that will not only solve their problem but will provide income and will also provide long-term

sustainability and viability as a business. The needs and desires of people in developing regions show that more often than Westernized (often technologically advanced) solutions, they desire something that is unique to their needs, abilities and cultural habits. Often, their own inventive and entrepreneurial nature has helped them to develop a local solution to a problem that could potentially be applied in an appropriate expanded scale within their own region.

A Myth: Lack of Sophistication of Emerging Markets

From the 1850's to the mid 1900's the masses in Europe and the USA were informed about new ideas and inventions through events such as public exhibitions, World Fairs, and similar venues. With the advent of mass media however, the delivery systems changed (television, radio, variety of printed media, telephone, etc.), and audiences changed accordingly. Information was directed more towards the individual rather than large masses of people (homogenous markets). With the spread of satellite dishes, the World Wide Web and email, global media, inexpensive international travel and communications, the people in many emerging markets are now becoming almost as well informed about new trends and product releases as are people in developed markets (Bell 1973, 78-81).

A significant driver of this sophistication of taste in emerging markets is a large population of teenagers. In 2001 there were 2 billion teenagers alive and well in Asia, Latin America, Africa, North America, Europe and Australia. That is 50 times more than the 40 million that made up the Baby Boom in the US in the 1970's and the majority of these new "Global Teenagers" (Schwartz 1996, 134-142) are in emerging markets. What is different about these Global Teenagers? They are connected, interconnected, and plugged in. They are in-touch and in the know, not just about whom they are with at the moment, but about all their "friends", no matter where they are on the planet. They connect via mobile phones, SMS, email, social networking services, and blogs (Friedman 2005, 192-193). All of this is possible through digital communications systems and networks that did not exist 15 years ago, much less thirty years ago. As communication through digital products becomes the pervasive method (leapfrogging land lines) in the developing world, then no matter what age one is, or where one lives, most people will be able to keep up with what is new in the developed world – and want whatever conveniences and luxuries they have.

At a recent presentation by Iqbal Quadir, professor at MIT (and founder of GrameenPhone, the Legatum Center for Development and Entrepreneurship, and the founding editor of *Innovations: Technology, Governance, Globalization*), a case was presented that proved that understanding how a region functions, and how a new idea can be integrated successfully into it, is the future of how innovation through design will forge a new future. In 1993 Mr. Quadir started Gonophone (Bengali for "phones for the masses"). After only four years of talking with possible funders, Mr. Quadir was able to put together a collaborative team that included a large telecommunications company (Telenor) and financing from a large micro-lending organization (GrameenBank), and as a result, today GrameenPhone has over 18 million cell phone customers in Bangladesh alone, after only 10 years of operation. Mr. Quadir's ability to spot the problem (connectivity = empowerment) (Quadir 2003, 27), understand the economic and political situation in Bangladesh, bring together collaboratively inclined entities that could make his idea move forward, and have the fortitude to keep working at a good idea even though everyone else tells you it won't work, is a model for success in the developing world. This is a very good example of entrepreneurialism and innovation hard at work.

There is a tendency, perhaps, to think of emerging markets as consisting of simplistic, uninformed consumers who want only basic goods. In fact, consumers in emerging markets are highly sophisticated and are informed by many of the same mechanisms (and sources) that exist in the developed markets.

Success ≠ Multinational Corporations in Emerging Markets

Most product designers are under the belief (through education) that the only place for them to work is in or for a multinational corporation. From a product production standpoint, many MNC's have looked at the developing world as a place to produce products at a cheaper rate and quantity than in their own country and so, many MNC's enter developing countries for their manufacturing or raw materials resources only. This approach has been economically quite successful for the MNC's (which is why they continue), but converting emerging markets into stable sources of revenue from product purchases by the customers has proven more challenging (Prahalad 2005, 151).

Historically and through traditional analysis, markets in developing countries did not exhibit enough economic viability for MNC's to develop a consumer market due to extremely low incomes and mostly subsistence levels of existence. In just the last five years that has begun to change, which has led to the appearance of emerging markets (United Nations) where the consumer profile of people living in developing countries is now shifting. They are experiencing a growth in the middle class (though the lower class is still the higher proportion) and the related availability of expendable incomes is starting to grow.

So what do MNC's do when they are trying to introduce products into an emerging market? The typical approach: an MNC will offer a narrow range of established products that have been successful in a developed market. Why? It requires the least amount of time, risk, financial investment, and new product development (for a potentially small market) on their part. They firmly believe in the product lifecycle theory (applicable in their own market) that suggests that the introductory phase of a product should be simple, easily understood, and targeted only at the more innovative market sectors. (Arnold 1998, 6-7) (Reinertsen 1997, 83, 248)

MNCs often erroneously adopt a "less developed countries" mind-set, assuming that these markets are at an earlier state of the same development path followed by the advanced or developed countries, that the game is therefore one of catch-up, and that market evolution patterns seen previously in developed economies will be replicated in the emerging markets (Arnold 1998, 9). This approach will often lead the MNC down a path of failure. What is the missed opportunity? As was mentioned earlier, emerging markets are often close to "Third World" country status in terms of technological infrastructure. This may make a MNC assume that the people are less sophisticated than a developing country market. However, due to the level and sophistication of consumer knowledge (remember, they too are connected), a leapfrogging approach can be used. Technological leapfrogging demands that entrant firms acknowledge a high level of customer sophistication in emerging markets and capitalize on the opportunities for reverse learning. In a rapidly changing social environment, emerging market customers with newly acquired disposable income may be less conservative and traditional than their developed-market counterparts (Khanna 2005, 9) (Reynolds 2006, 133-48) (Thakara 2005, 8-15). MNC's, and the designers working for them, need to learn something about emerging markets as future consumers, and how to collaborate with them during the development process.

3. The Environment

If the product development and manufacturing world produces products for only 10-15% of the world's population now, what will be the impact on the environment when it starts to develop products, in the developed world method, for the other 80-85% of the population? According to the US Geological Survey and UN statistics on global population data, the world is at a turning point. Many natural resources that are used in production of electronic gadgets, transportation products, and other products that make lives easy, are about to run out. Antimony, which is used to make flame retardant materials in the furniture and interiors industry, is

projected to run out in 15 years at the current rate of extraction. Indium, a key material used in computer chips, is projected to run out in less than five years. Silver will run out in ten years, and terbium, used in making the green phosphorous for fluorescent light bulbs, could be gone within eight years (Cohen 2007, 36). So, it is clear that going about developing of products for the developing world may need to be approached in a way that is different from the resource gobbling, emissions spewing, and waste producing methods of the Industrial Revolution.

There have been numerous authors over the last few decades that have tried to communicate ways in which corporations and product development teams can understand our earths' ecosystem. David Wann (1994, 7-10), a pioneer in whole systems thinking, gives a good argument and image as to why we humans should stop considering ourselves outside of nature–and it looks very familiar to the predatory animal world system we all learned about in school (small fish gets eaten by bigger fish, etc.). This diagram illustrates how we humans relate to one another in our manufactured world. If you compare this to Figure 1 shown earlier you will see how closely the roles we play coincide with the economic levels at which we subsist.

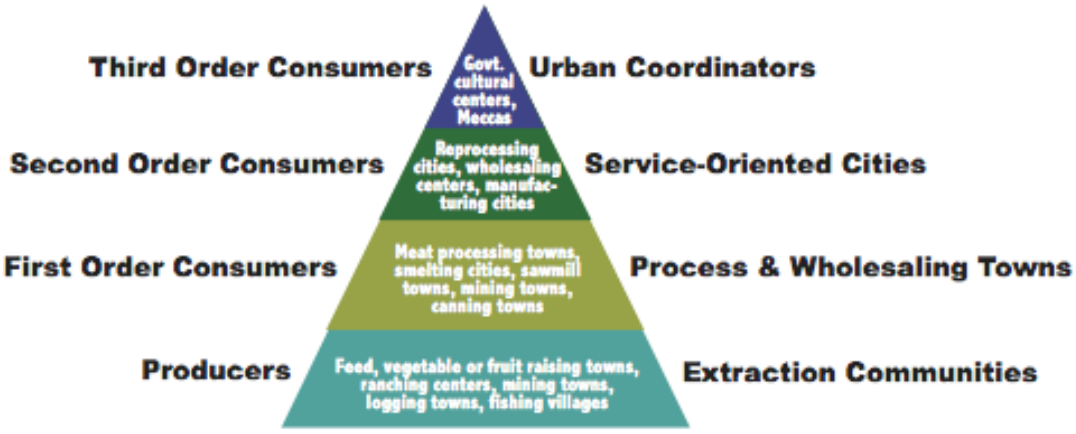

Fig. 2: Human Systems as Nature (Wann 1994, 7-10)

Wann's (1994, 7-10) guidelines for humans, and especially designers, to understand the ecosystem that we are part of includes the following rules for being able to work and produce in a more sustainably responsible manner:

1) Understand basic physical concepts like gravity, nutrient cycles, and the flow of sun, wind and water.
2) Use resources on a sustainable basis – use savings, not the principle!
3) Use the right tool for the right job – no need to thread a needle with a tractor! (Need more diversity in solutions and acceptance of using low tech and appropriate tech where possible)
4) Monitor what goes "in" so junk (pollution) doesn't come out
5) Make a habit of tracing origins and future routes of each physical interaction – cause and effect!
6) Acknowledge uniqueness of location and its inhabitants – all environments are different
7) Use the simplest product or process to get things done
8) Use software (information) rather than hardware
9) Use design solutions that solve 3-4 things at once
10) Account for cost with the full lifetime of product in mind (LCA for everything, not just materials!)

These rules mesh well in content and intent to the seven point agenda developed by the UNDP (United Nations Development Program) in 1998 (Robins 2001, 49):

1) Ensure minimum consumption requirements for all.
2) Develop eco-efficient goods and services
3) Remove perverse subsidies and restructure incentives
4) Strengthen public action for consumer protection
5) Strengthen international mechanisms to manage consumptions global impacts
6) Build strong alliances between consumer, poverty and environment movements
7) Foster synergies between civil society, the private sector and government. These are both good starts and are further supported by Wackernagel's (1996) goals for what are necessary conditions for developing sustainability in industrialized countries:
1) Reduce an individuals' Ecological Footprint
2) Secure a satisfactory quality of life for all

By following these simple ways of thinking about a development project, no matter what stage one is at, designers could be part of moving forward in creating responsible, environmentally supportable solutions for communities already living on the edge.

4. Co-creation

C.K. Prahalad and Venkatram Ramswamy introduced co-creation, or the idea of it, in their book *The Future of Competition: Co-creating Unique Value With Customers* and it introduced readers to different ways of engaging with customers in the product development process. Depending upon one's role on the product development team, the interpretation of how one might use co-creation to create value will be different. It is also important that the term co-creation is not confused with the practice of consumer generated content, mass customization or other similar, but different methods. Co-creation, in its pure form, is just what it sounds like – making something together.

To co-create, all members of the community affected by the introduction of a product or service must be present at all phases of the project. As the planning phase of projects is where the business, research and creative team can push the limits on how they get involved with their customer, it is vital that the user/customer be part of the project at the start. In developing regions, the user/customer could be the "end user", the manufacturer, the local non-government organization, or even the local government. During the final phases of a project, commonly the production and distribution phase, a company can look at new ways of manufacturing and distribution, through using local materials for production, local specialized expertise in manufacturing, and local organizations to aid in distribution. Keep in mind, that in the developed world, many of the products that are manufactured are made by machine, a method that came about during the industrial revolution when there were more people to provide products for, but not enough to make the number required in an efficient manner. In the developing world there is an abundance of people, plenty that lack employment and whom could benefit greatly from getting involved in such a project.

Co-creation requires a bit of rethinking how to structure and implement projects, but more importantly requires a different way of using design tools that have been developed for Westernized cultures. In the past, industrial design has infrequently adopted new methodologies into its practice. The newest is the morphing of anthropology based ethnographic methods, modified to fit our fast pace and low budget projects, into our own design ethnographic models (Taylor 2002, 175-186) (Kelly 2001, 41-52) (Laurel 2003, 28). Designers started to go out and 'observe' the customers, much like sociologists observe cultures, from afar. They shoot photos,

watch, take notes, and sometimes talk to the customers, but with scripted questions that are formed beforehand. These methods have taken designers closer to ‘understanding’ consumers, but again, designers are still able to take some of the knowledge that they personally have about western, developed cultures (where they are from) and apply that knowledge effectively. In developing and emerging regions designers do not have that luxury.

Architecture has long included their customers in the process. Some individuals, like Christopher Day, have always included their clients in on their projects, and, not only does he include them on a basis that informs them of progress, but, he actually brings them into the design process and works with them at the table, drawing, building, researching, etc. He says, “In every other aspect of life, except perhaps the arts, teams have supplanted individuals. Life, after all, is about interactions: teamwork. Businesses nowadays depend on it. Amongst architecture firms, research has shown that the more participatory the office, the more effective, both in business and design quality, are the process and the results. Tycoons and prima donnas are something of the past: nowadays few of us want to hand over the place where we will live to such egocentric personalities.” Unfortunately there is false belief that people untrained in the arts cannot design beautiful things on their own. Yes, this is possible, look in folk museums across the planet – they are filled with beautiful, functional objects. In fact it is shown that people who make their own things look after them; treasure them; they protect them (Day 2003, 205-6).

Participatory design and empathic design are approaches to the front end of the process that were introduced back in the 90’s by computer software companies and have been adopted and applied to the greater product design process. They both have identical foci – getting hidden, or latent desires and needs onto the table (Ullrich and Eppinger 2004, 175). Each is an extension of observational techniques but are done in the customer’s own environment. They look for how end users customize products and services to fit their own needs. They are able to observe honest emotional responses to situations and interactions. By spending some time with the customers they are also able to observe reactions and interactions repeatedly, thus unlocking unspoken and unarticulated user needs and patterns. Observing, capturing data, reflection and analysis, brainstorming for solutions and developing prototypes of possible solutions are all steps in the empathic design process (Leonard 1997, 6). Engineering and product development groups in MNC’s have much experience in using these methods, as do many design firms like IDEO, frogdesign, Jump Associates, and others.

Prahalad’s ideas on co-creation go deeper still – as that is what is necessary in developing countries and emerging markets. Co-creation is empathic techniques plus ethnography plus participatory methods on steroids. It includes the user/customer as part of the team and affords them the same level of importance as any of the other members of the team. In developing countries, as was mentioned earlier, the user/consumer is smart, connected, intuitive, entrepreneurial and a consummate problem solver. Without infrastructures and services to problem solve for them, they have learned how to do it themselves, and have for generations. The funny thing is, we in the developed world used to do it to. The industrial revolution and the machine age took us away from that, and though many good things are a result of it, there may have been some things that we lost.

As Mitchell (1996, 128) points out, though involving users in the design process may seem simple and logical it is a very fundamental challenge to the prevailing school of thought. In fact he says that in the recent past that though the discussion of being responsive to users is at the forefront, few, if any have actually tried to involve them directly in the process. Instead, designers, who set themselves apart from the masses, tend to make assumptions about what people will like, maybe ask them what their preferences are, or even present alternative solutions to them (prototypes) for review. However, the user is never given a true opportunity to be involved in the actual process of design. Integrating the user and customer fully into the process is the near to final step. Sim Van der Ryn (1996, 4-22) argues that design epistemology is flawed, as are a number of other parts of our society like agriculture, architecture and industry.

He argues that we have not given design a rich enough context. The author would argue that getting users and customers involved in the process, along with integrating sustainable development methods throughout could enrich our profession greatly. Even more so however, is the necessity to do this for any work and development done in emerging markets.

In the developing world, users and customers are smart. They problem solve on a daily basis. Why? First, they are economically challenged to the point where they do not have the luxury to go and hire someone to fix their car, their stove, their house – they fix it themselves with whatever they have on hand. Second, the infrastructure to do that, even if they had the funds, is not there. Locality breeds innovation and necessity breeds entrepreneurship. Additionally, since many of the people living in these developing countries are living closer to the land and to nature, they are inherently more connected to how what they do affects their environment.

The idea of co-creation with developing and emerging regions of the world, really getting customers and users to sit at the design table with us, is the future. Users bring a level of intrinsic knowledge of their culture, their environment, nature, problems they and their community face, connections to their system, and ways of thinking through and solving problems that are designed to work for them. In developing countries, working with users and customers, along with working with local organizations, is the secret. For MNC's it might require starting new businesses that can operate swiftly and flexibly. For individual designers it will require embracing new modes of thinking that include collaboration with governments and other organizations, working with users and customers as co-designers, understanding more about sustainable product development, focusing on sustainable entrepreneurship, and also looking at new methods of innovation, production and distribution that more thoroughly incorporate the customer and user.

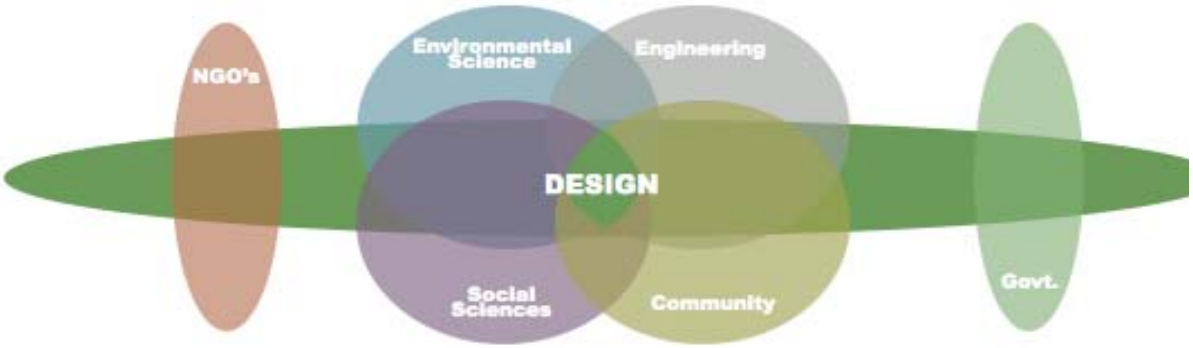

Fig. 3: The "collaborators" in sustainable product development in emerging markets (Speer 2006, 5

5. Guidelines for the Future of Design in a Sustainable World

Designers as collaborators and entrepreneurs that are environmentally focused and motivated by creating sustainable systems and communities, are the new future for the design profession. Rejection of the status quo that design history tells us is the way to be successful is necessary. Looking outside of design to find models, strategies and methods is the secret to updating the design profession so as to fit modern environmental and social demands. Below are some guidelines developed by the author to aid young and older designers alike in moving towards this new vision for design.

Multinational Corporations:

1) Form new businesses and ventures that can operate outside of the normal corporate structure and personality. Emerging markets often require risk-taking tendencies that are not supported by typical MNC's and large corporations.

2) Prepare to learn how to evaluate markets using different criteria and methods that integrate data not obtained off the UN website and similar information databases. Data mining for trends will be more the norm, rather than past use of statistical information about GDP, etc. (Prahalad 2005, 85)

3) Incorporate methodologies to learn more about your customers. Even better yet, go spend time in the culture. Do not go directly to the first urban center, do not stay in western hotels, do not go to Starbucks. Live with the people and learn to understand them as individuals first, as collaborators second, and as a market third.

4) Work with both government and NGO's in collaborative manners so that you can learn from them. Do not look to them for only regulatory data and rules. (Masera 2001, 212)

5) Always think sustainable. Sustainable business models. Sustainable production. Sustainable social models. Sustainable sourcing of materials.

6) Commit to path breaking rather than benchmarking. Disruptive innovation, thinking and acting is often the right way in emerging markets.

7) Be willing to use the right and appropriate technology for the right job. Often the newest technology is not the best one for the situation, sometimes it is.

Individual Designers as Entrepreneurs:

1) Collaborate with entities you are not used to working with. Government representatives, NGO's, local community organizations, trade organizations, and micro-lending institutions. These are the new clients.

2) Spend time in other cultures. Get out of the city. Visit small villages, stay with families, and eat in local restaurants.

3) Learn a culture's language.

4) Think sustainable. Sustainable business models. Sustainable production. Sustainable social models. Sustainable sourcing of materials. Go beyond LCA.

5) Start small and simple. Do not try to reinvent the world in one day. Often working with clients in the developing world requires a commitment that requires years rather than months.

6) Think of yourself as a social entrepreneur first and a designer second.

7) Do not think that you know everything – in fact, assume you know nothing. Your collaborators will be the experts and you will learn from them.

8) View design as a process rather than as a means to an end. Look at it as a "continuous process that defines a system's rules rather than its outcomes" (Thakara 2005, 220-226).

9) Be open to more and more inclusive models of product development. A designer working alone has a limited role. A designer collaborating is empowered (Lewis 2001, 13-24). Designers fill the needed role of environmental and social champion in product development in emerging markets.

10) Do not believe that working for a MNC is the only option. Micro and small enterprises are the backbone of the private sector and account for over 90% of enterprises in the world and account for 50-60% of employment globally.

6. Conclusion

The innovative thinker Larry Keeley best stated it, when he said “For us, effective plans have their basis in a deep and profound understanding of user needs”. Users are not just the people who “use” a product, but are *all* the collaborators involved in a project. From the non-government micro-lending organization that pulls together community groups and businesses; to the government cultural agencies that pull together the producers in the community; to the actual makers themselves; to the designers who innovate new products; all are part of a new paradigm of development in emerging markets in the developing world. By adopting new ways of thinking about who the “clients” are; by engaging with the users (the whole community) as early and as pervasively as possible; by forgetting what designers already know so as to learn better ways of doing; these are just some of the methods that will need to be adopted to work in emerging markets.

As designers in a complex world, how we integrate our talents and knowledge into the product development process is open for speculation. However, with the increasing need for sustainable and socially responsible solutions, it is an optimistic vision that emerges. Within a large corporation, designers have the opportunity to lead through being the holders of knowledge and expertise in methodologies that we currently use and that can be applied to a greater spectrum of the process. As designers with an entrepreneurial spirit, a social conscience and environmental savvy, we can enter into the future as experts in collaborating with customers and users in emerging markets. We should look forward to the opportunities and experiences that await us as we attempt to address a very large group of people that most of us have never designed for – the 5.4 billion people on this planet that live in developing countries with standards of living and modes of working that are very different from ours. And so, as John Thakara stated at the beginning of this paper, and it can be no better said – “we are all designers now”.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

What if the World Were A More Equitable Place

[Would Any of Us (Designers) Be Necessary?]

David Stairs[1]

Abstract

In the pursuit of sustainability and social justice designers need to provide access to their knowledge and resources to people from less developed societies. This can best be achieved through education, with an assist from philanthropic development. The author gives examples of his experiences utilizing altruism as a design methodology.

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Introduction

I'm trying to envision a world where technology is not merely ubiquitous, but affordable. I'm told that such a place exists, that designers are applying their abilities to make it real, but I'm still skeptical (Stairs 2007). I'm searching for a world where access to communication is not based upon social caste; where healthful futures for all the world's people are not based upon massive changes, but personal, incremental, community-oriented steps (Stairs 2006). A world where opportunity is so abundant that I am made professionally redundant, but the vision does not arise.

In lieu of this imaginary place, I must be temporarily satisfied with ad hoc efforts to deliver opportunity to those less fortunate, less affluent, less connected. I must suffer the efforts of some to co-opt the world's have-nots into global visual networks. Or accept the implication that disaster relief is the best way to help.

Aims

I'm not trying to re-envision the world in the image and likeness of my culture. Far from it! What I'm interested in seeing is what others do with the same set of tools that are available to me. How will they communicate? Interrelate? Anticipate? Will they lose themselves, their unique culture, or will they enhance it? Haven't others been doing just that (enhancing) throughout centuries of technological exchange? Isn't that what moves us all along, exchanging methods, sharing ideas?

What I'm proposing is what I've been doing these last eight years: Projecting design education and socially just practice into other cultures. Not unsuspecting victims of conquering colonial invaders, but willing partners interested in exchange, expansion, and access.

Education is the master metaphor of human evolution. Through it we create continuity by bridging the past to the future. Design education is my avenue of aesthetic, social, and economic interaction. I am not interested in intellectual privilege, or in the success of a given profession, but in the efficacy of design as an instrument of social change.

Designers Without Borders(Designers Without Borders) is the vehicle, the vision, the means of focusing legal, financial, and technical resources on the goal of social change. It is both aegis and umbrella, providing organization and context for the purpose of development through design. When we speak about economic development through "globalization" I see only the manifest effects: marginalization. Instead of globalization I have begun to strongly believe in localization, a much better metaphor. By marshaling available resources in an effort to assist those less well off, we focus not on the world's difficulties, like the media does, but on its possibilities.

Through *DWB* my colleagues and I have devised curricula and delivered design resources to over 500 students of Makerere and Kyambogo Universities, Mwereerwe and St. Kalemba's Secondary Schools, the Foundation for Development of Needy Communities, the National Committee of Women Living with AIDS, and FHope, to name a few institutions, all located in Uganda.

I will be the first to admit that this is only one of many possible scenarios. After all, as an individual I see only part of the larger picture. But this is how I have chosen to assist those less fortunate than me to seek broader understanding and locate access to opportunity. As a result I have been called "idealistic," "noble," and "unpragmatic."

Collectively we see further and better than individually. I am happy to report that I am only part of a larger movement. *Designers Without Borders* is just one of many such initiatives being undertaken by designers worldwide today.

Africa is key. The birthplace of humanity is today the world's most disadvantaged continent. How this came to be is less important than what we must do to reverse things. We need to find ways to enable Africans to compete on their own terms and from a position of

strength. Design has a place in Africa's recovery. And Africans, natural designers in their indigenous approaches, have a place in the world of design. Not as markets for Asia and the West, or as suppliers of commodities or tribal crafts, but as creators with living design solutions to longstanding everyday problems. Design is transformative. Design and education combined have the potential to be revolutionary.

The *Design-Altruism-Project* (Design-Altruism-Project) is the nexus, the community, the online resource where we test the resilience of a new memeplexe (Stairs 2005, 3-12). What, exactly does this mean? Scientists have speculated about the genetic basis of altruism since Robert Trivers, Bill Hamilton and Richard Dawkins in the 1960s and '70s. The latter's proposal of a "cultural unit equivalent to the gene" makes a great deal of sense when one tries to connect altruism and design. Does the meme for altruism extend to the practice of design and, if so, can it serve as the basis of change for our profession? Can "reciprocal altruism" result in a new model of design practice? Can design for the betterment of society evolve into the predominant paradigm for design professionals? (Hamilton 1964), (Trivers 1971), (Dawkins 1976). In some places, the meme is already actively applied to design education. In some minds, however, it is more a matter for a complete reconsideration of the profession.

Okuwangaala is the book, the document, the investigation of how another culture applies design thinking in its own inimitable manner, not as an import, but naturally, unselfconsciously, as an element of human evolution (Stairs 2002, 70-88).

How do pre-industrial societies survive in the Information Age? Is it possible to jump-start economic development without suffering the same problems industrialized nations have encountered? What are the unique cultural products of vernacular design? What part does it play in balance of trade? Indigenous design wisdom points the way toward possible solutions (Stairs 2006, 81-96). Enlightened assistance acts as reinforcement for these efforts.

If we are to truly be agents of change, we must not be afraid to be confrontational. Some will choose to do this through conventional channels, working to encourage change of the corporate culture, applying old ideas to new problems. Others will be more radical. Either way works. As my countryman Malcolm X once put it, we must proceed "By any means necessary." We must make the choices that will sustain our momentum, encourage universal participation, and respect traditional wisdom.

The ultimate goal is exposure, inclusion, access, the smelly human closeness that occurs when people are mutually excited about a shared idea. This can be accomplished through a variety of means; education must play a role. In many places universal secondary education does not exist. To the extent that design can help to improve this situation, it should be employed. Technology transfer is part of the burden, and generally mutually advantageous. We cannot be afraid to take the risk of giving away what we have or know.

When these things are accomplished the world *will be* a more equitable place. In this way we *will* make the world *more* sound, *more* whole, *more* just, *more* livable for our children. When the world is a more equitable place, our role as designers might not be as necessary any more. By making ourselves hyper-pertinent now we may succeed in diminishing our roles later. But this is OK because when all men and women are rightfully seen as designers, as is naturally the case, then and only then will we have succeeded.

To paraphrase John and Yoko: "Change happens, if you want it."

Let's not just want change, let's actively work to bring it about. Webale enyo. Thank you for listening.

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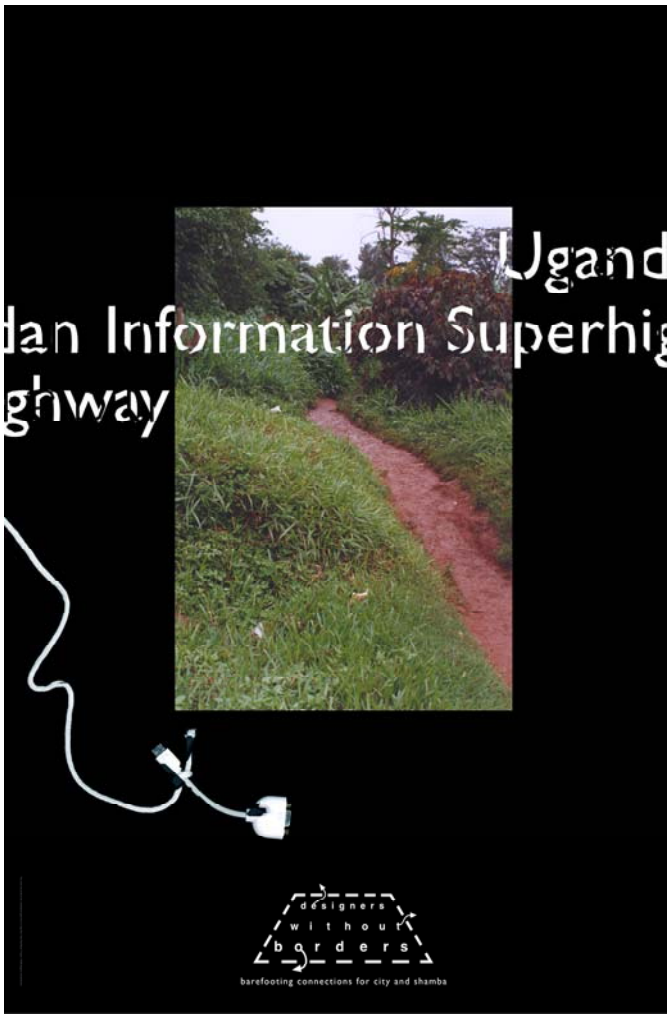

Fig. 1: Designers Without Borders Sappi grant (2003)

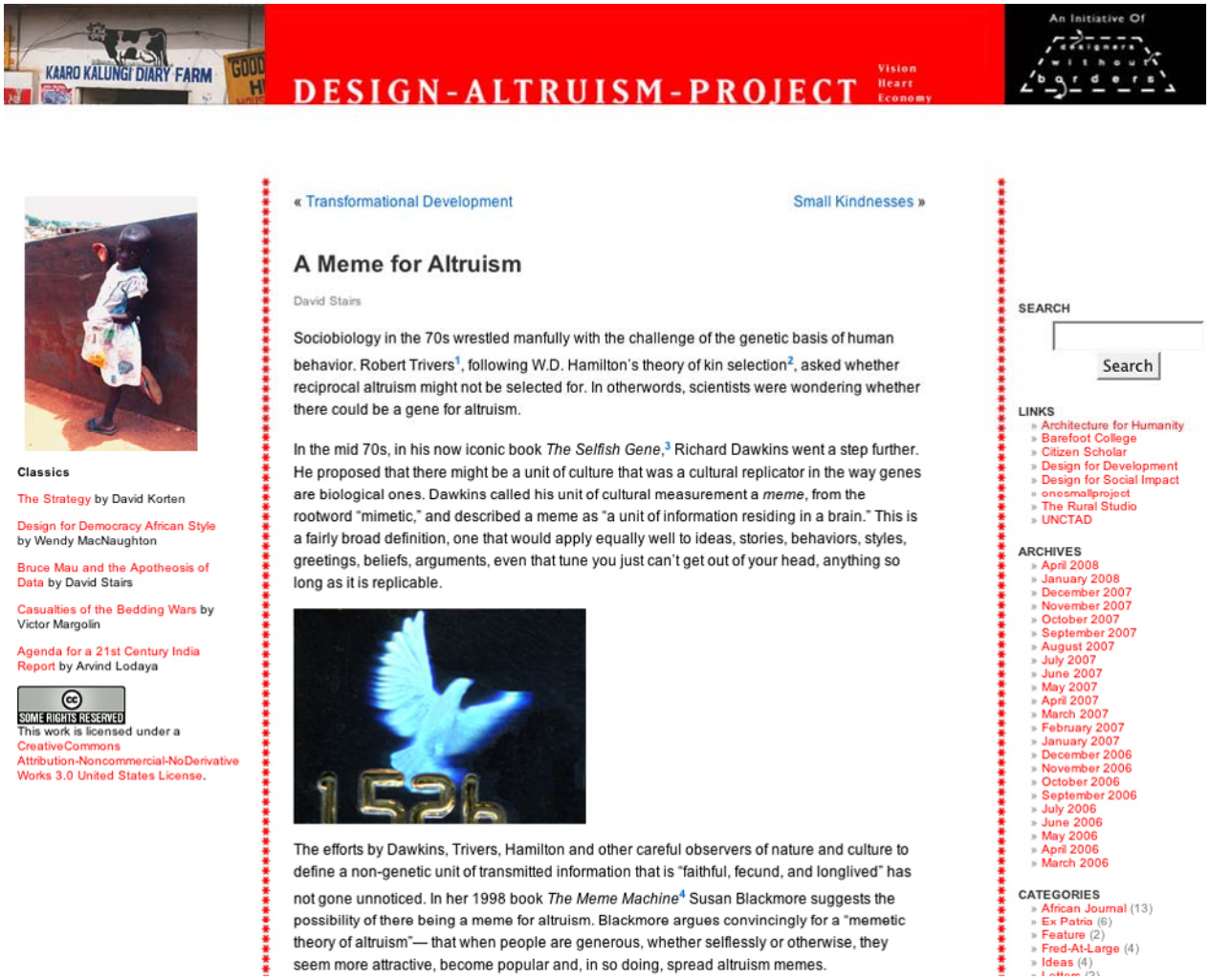

Fig. 2: Design-Altruism-Project site (2006)

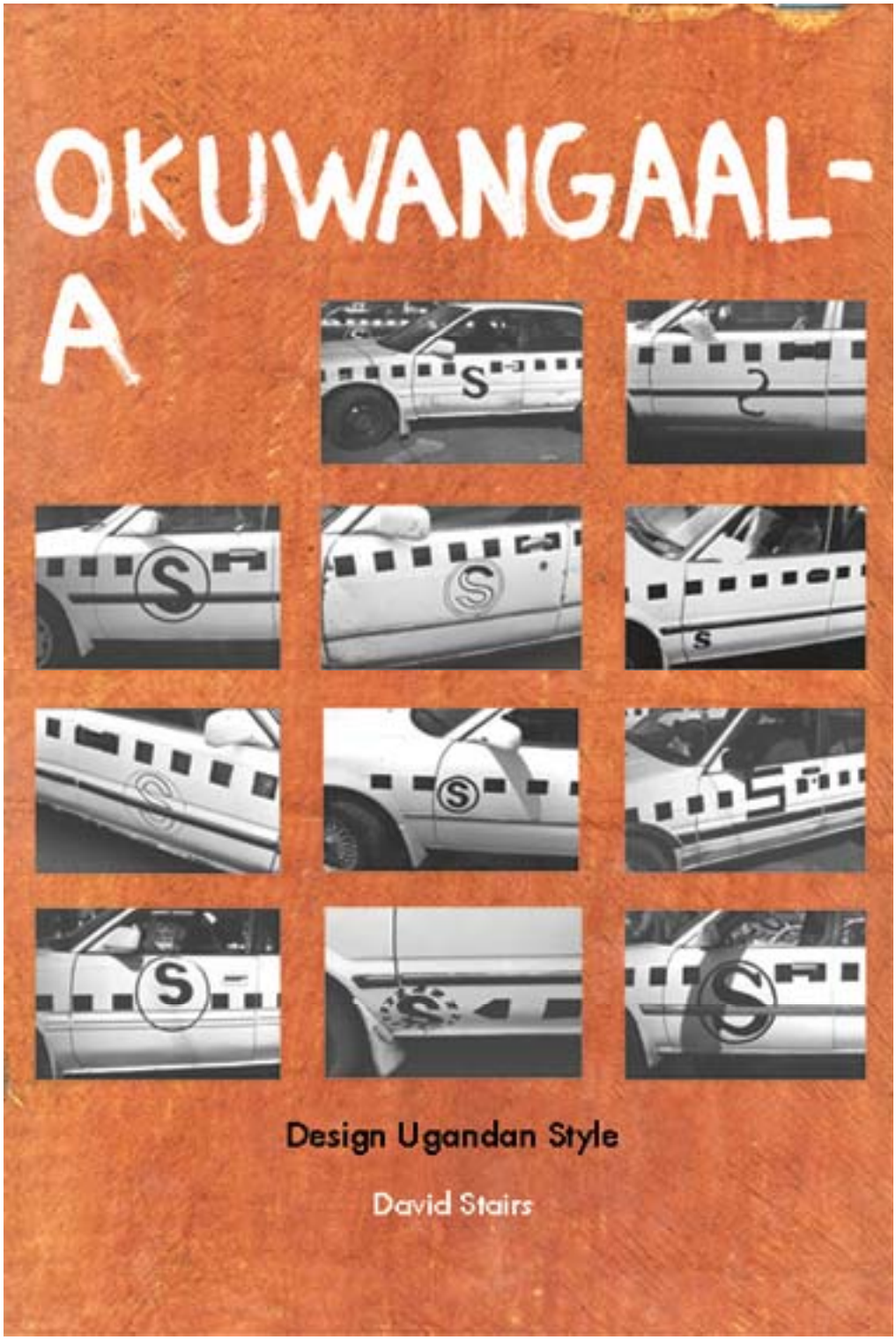

Fig. 3: Okuwangaala (forthcoming from MIT Press)

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Visions and possibilities of a *transsociation* between design and anthropology

A method for a *glocally* driven product-system innovation

Eduardo Staszowski[1] and Piero C. Leirner[2]

Abstract

The purpose of this article is to reflect upon some interfaces between global and local layers in processes associated with design. Starting from the understanding that production and consumption of goods can be subjected to specific or local appropriations, we attempt to work on certain possibilities of development of a transdisciplinary method which associates design, understood as an operation of cultural mediation between producers and consumers, and anthropology, seen as a possibility of understanding how cultural perspectives take possession of goods. We call this method *transsociation,* taken as a new form of association which respects the specificities and limitations of both disciplines. The paper offers examples of how this mediation can be developed and applied. In synthesis, the paper proposes a tentative method on which design is associated with the anthropological approach aiming at promoting a novel practice, in a world of flows and exchanges that define multiple markets and cultures.

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1. Introduction

The purpose of this article is to reflect upon some interfaces between global and local layers in processes associated with design. Starting from the understanding that production and consumption of goods can be subjected to specific or local appropriations, we attempt to work on certain possibilities of development of a transdisciplinary method which associates design, understood as an operation of cultural mediation between producers and consumers, and anthropology, seen as a possibility of understanding how cultural perspectives take possession of goods. We call this method *transsociation,* taken as a new form of association which respects the specificities and limitations of both disciplines.

Two main questions guided us towards the development of this idea. Firstly, creative processes in design, which are similar to many other processes oriented by the contemporary industrial-capitalist logic, do not seem to have precisely qualified points of departure or arrival. Stated another way, this means that the so called 'globalization process' creates side effects and local forms of appropriation or deviant behaviours, which are particularly unpredictable. An example of which would be the well-known case of the Haier Group, a global household appliance manufacturer, which faced a high number of technical problems with a specific washing-machine model in the Sichuan region in China when found out that users were also making use of their washing-machines to wash sweet potatoes. Haier therefore modified the product to respond to the double use of washing clothes and potatoes. Another example was the case of pre-paid mobile phones in Africa which were being used as a tool for transferring money among users using mobile credits; a practice that has launched a new form of microcredit or mobile banking with the emergence of new companies such as Wizzit in South Africa and GCash in the Philippines[3]. Somehow, we argue that a company's inventiveness as well as the modes of appropriation of products shaped by design end up by being transformed by the way these products are locally experienced by people who use them. For this reason, we evoke the idea of an anthropological understanding of design-related products. Secondly, we decided to carry out an exercise of experimentation - yet preliminary – aiming at approaching both disciplines, taking into account their limitations and possibilities.

Therefore, we can first observe how this association can be useful to consider some concepts which are generally very often mentioned but are ill-defined. 'Globalization' and 'locality' are two of them. How do we understand them? Fundamentally, the process of globalization, as it is understood here, does not imply in a loss of specificities or local particularities. Under this perspective, the 'local' is not understood solely as a space of expansion of the hegemonic and homogenizing spheres which try to be placed in the centre of the globalization process. Analogously and furthermore, we suggest that the hegemonic centres are also subjected to the transformations stimulated by elements coming from the local spheres.

By trial and error, it is our responsibility to consider a series of questions which 'denaturalize' these categories: how many centres and peripheries do exist? By assuming the centrality from one point-of-view and not another, what is central? Similarly, if the global exists, where is its centre? And what is local from the point-of-view of the global's centre?

[3] As noted by Sara Corbett in the article "Can the Cellphone Help End Global Poverty?" The New York Times, April 13th, 2008.

2. Copacabana, Rio, New York

One of the points we intend to discuss, inspired by a relativistic notion, which leads our perspective towards the concept of 'point-of-view', is that the local always places itself in the centre and *peripherizes* other relations less perceivable for itself. Even though this is a relatively simple equation, it is hardly ever noticed or perceived by some agents who consider themselves more central than others. As with the example of Wall Street, which considers itself the centre of the world: from the point-of-view of a peddler selling beach towels in Copacabana, this is an innocuous perception and not only does the stock exchange have little effect on his life but also he is not aware that Wall Street traders consider themselves as such. Clearly, one can argue that the stock market determines the flow of tourists who will be visiting Rio, the very same tourists who will buy the towels in the end. On the other hand, beach towels, coconuts and hotels are necessary steps to the realization of capital which has started even before Wall Street. In short, no one is absolutely certain about how a social process starts and ends. It is what Latour would call an 'actor-network', a process in which we only know for sure what we can relate to or make a connection (Latour, 1991). That effect has finally proved its power in the world manufacturing: the larger the number of components, the more difficult to establish their origin. For instance, in a computer or a tyre, the embedded technologies are the result of the concrete experience of the network which invested its labour-power in that product. Moreover, every product is designed to be positioned in a network of consumption or as Manzini points out, in that case we have an extended product system[4], or a space where, subjects, companies and localized communities meet (and clash) in a process of value production (Manzini, E., Vugliano, S., 2000, p.15).

This is a point that has been studied extensively by anthropology for quite some time. Many of the studied relations within, for instance, the so called 'primitive people', considered production and consumption inseparable. For example, eating in many native ideologies is part of the process of conception and production of babies. Nowadays it is considered common sense in many contemporary capitalist societies, but it is relevant to notice that until the 1960's no one mentioned that 'quit smoking' during the pregnancy was compulsory and eating restrictions were seen as a mere superstition. Design, accordingly, joins the world of industrial production, as an area which par excellence must consider the consumer's point-of-view, which is in principle intangible and present in a contradictory subjectivity with the objectification of the contemporary world.

It is worth mentioning, however, that this process has managed to overcome the appalling massification which has always haunted the social theories of the 20th Century. For instance, the internet and the decentralized networks of computers and people, being an unfinished process, is prevailing over the closed networks of communication, which challenges us to reflect upon categories that respond to this multiplicity seen nowadays. Thus, one of the problems we face is the dissolution of those landmarks that were considered absolutely reliable in our way of thinking.

One of the ideas seen here, which supposes an analogy between elements described by ethnology and processes associated with design, is related to the way in which theses disciplines can reason in terms of production and consumption concepts and at the same time in terms of dissolution of canonical dichotomies such as 'interior/exterior', 'subject/object', 'centre/periphery' and, consequently, 'local/global' or 'simple models of push and pull, or of surplus and deficits, or of consumers and producers' (Appadurai, A., 1996, p.32).

In this process, it is appropriate to remember that even Marx, in a less known part of the Capital, considered an imbricated process between production and consumption called 'productive consumption'. This is to be regarded not only because when we produce something,

[4] Product system is undestood as "a system of products and services that fulfils one function, which satisfies consumers' need. Product system development includes product design and design of the service system that minimises the product's environmental impact, as well as analysis of existing infrastructure and social arrangements that help with a more environmentally benign performance of the product throughout its life cycle." (Mont, 2000).

technological resources are also consumed – work is incorporated in goods which produce other goods – but especially when we consume, we also produce a potential labour-power. Dialectically, in the circularity of this process, both steps tend to produce and consume one another. Bearing in mind the intellectual work, especially the one associated with design, this aspect becomes crucial. Design is above all a relationship of experimentation between the potential of consumption and the potential of a good. It must then go through the clash of distinct points-of-view, so as not to become a reference endowed with what we call '100% objectivity'. Objectivity supposes that all points-of-view concur and when the points-of-view are different, it does not mean they are contradictory.

If design is a process which involves perceptions and taste creation, it is something that takes us to levels of distinction and competition, productively as well as consumptively. Analyzing a radical example: 'distinct' people buy great works of art; however, could we say that the works of art create by themselves a distinction which is bought by people? Design taken in its most radical form could be led to this direction: a tool for creation of distinctiveness for who produces it and for who consumes it. Distinction here is the base of the difference or the difference of points-of-view. In this case, we are not talking necessarily about hierarchical distinction but, for instance, multiple tastes or different qualities. It is worth mentioning though that the goods or product-systems exchanged in the market are very different in nature and in some cases tend to be less tangible as in the case of services. The form of a good (tangible or intangible) is not the only aspect that determines the distinctiveness but also, for instance, the quality of the exchange of the good itself and the dimension of the experience involved. This assertion makes us think on the ubiquitousness of design and the possibilities to intervene in a much more complex process of value creation.

Roughly, this idea could be compared to some sort of 'cannibal culture' of the world of goods: it is unknown whether they make people or people make them. How to turn this movement into a practical idea? Since companies tried to understand who are their consumers, it is impossible to predict who precedes whom and where resides the authenticity. Like culture – object of the anthropologists – it is impossible to determine the 'origin' of its elements. There is always one phenomenon behind the other. In this way, culture like objects, can be understood as an element in a constant process of reinvention (Wagner, 1981). By now we could affirm that a brand represents more competently the consumer's identity than the company's identity itself; or is it the consumer's identity which has built the company's identity?

Great part of the cultural criticism on the rigidity of the above mentioned dichotomies is being elaborated in anthropology, for instance, by dedicating itself and for quite a long time to the theme of anthropophagy[5]. Among other things, it is known that cannibalism is associated with reproduction and not only with destruction and death ('I kill and incorporate my enemy') so as to create new relationships in my own world. As a result, it also transforms the world of those related to my dead enemy in a symmetrical way. In this case, the consumption and/or destruction can be understood as production and/or incorporation, and the reproduction can be seen as a transformation. Through this perspective, the 'other', seen as the figure of the enemy, becomes part of the 'self' and the boundaries between what is 'mine' and what is 'exterior' become blurred. This example is helpful when analysing the limits of categories such as 'centre/periphery', 'global/local', as well as 'competition and cooperation'.

This process being understood, it is essential to adjust or polish this vision, in order not to transcend some ethical limits imposed to both disciplines.

[5] The term anthropophagy, was employed before in Brazil by the artistic vanguard of the 1920's leaded by the Brazilian poet Oswald de Andrade in its "Cannibal Manifesto", to defend the idea of "cannibalizing" other cultures and remodel them in a Brazilian way, thus protecting Brazil from cultural domination.

3. Ethical questions

One of the points we are willing to clarify is that we believe that the main purpose related to this proposal of association between these two disciplines is to improve the quality of people's life (the improvement of the social and environmental of qualities of a specific context) and not simply to create another catalyser of class distinction. Therefore, the distinctions that design creates, such as anthropology recognizing distinct points-of-view, must be useful to produce a sort of 'relational multiplicity'. What is this? To some extent, it is the possibility of thinking about how a design-associated process could relate multiple points-of-view in the production and consumption of a good – and not only the one linked with one of the parts: aiming at making profit or its immediate consumption. Hence, we can mention some movements which promote a critical consumption such as those connected with the *Slow Food* and *Fair Trade* associations or the consumer's critical participation in the design of solutions and a globalization, which is based on the circulation of global knowledge, the valorization of local resources and the safeguard of consumers' and producers' life quality. At this specific point, an explanation is required: we do not refer to either an attempt to merely develop an applied anthropology, which is responsible for 'discovering' native logics and pass it on to the producer so that he can make good use of it, or a divagating design, which remains stationed in the possibility of never arriving at the fullest form of subjectivity of those who produce and those who consume.

Above all, we should consider how concepts which belong to one discipline could affect the practice of the other and vice versa. One example to digress: in 1930's Levi-Strauss brought an expedition of Nhambiquara Indians to the city of São Paulo and it was noticed that nothing impressed them; neither skyscrapers, nor department stores or even an airplane tour. Back to their village, he found out that the object which really fascinated them and was incorporated in their stories was a ball used as an ornament at the end of a stair rail. That ball was also incorporated in their ceremonies.

The same perspective can be used to approach wider spheres, such as markets being transformed by similar processes, given that they are also conceived within flows which incorporate 'external' and 'internal' elements that can migrate to the exterior as well. Since markets are also subjected to the movements of appropriations and cultural exchanges, the designer can make use of a vision of the world built by anthropology to innovatively mediate the production and consumption of new products and services. Finally, what makes us believe that this is a possible exercise is the fact that both anthropology and design are cultural inventions and, to a certain extent, they share the same inventive nature.

4. Evidence from the design practice

From the design practice we can draw relevant examples where the *transsociation* approach or the incorporation of different points-of-view in a design process have been successful employed. In this paper we refer to two distinct cases:

Elephant Design

Elephant Design is a product development and design consulting based in Tokyo, Japan that developed a digital platform on the web that "encourages individual users to express their needs as consumers and take part in developing ideal products based on personal requirements"[6].

Using its 'Design to Order' technology (Fig. 1), Elephant Design first invites potential customers to express their needs as consumers, for a product they would like to be produced and then makes a selection of ideas and coordinates the work of designers and manufacturers interested to produce it. The final product is then presented back on their website to attract buyers. Once orders for an item reach the critical mass the product is manufactured.

This case offers an interesting insight regarding the proposed *transsociation* approach. It is related to the fact that the opening of the design process and the improvement of the quality of interaction among many actors involved in a solution can contribute to creating a radical transformation in the relationship between producers and consumers and among consumers themselves.

El Hema

El Hema is a project, which resides in the threshold of art and design, developed in 2007 by Mediamatic[7], a cultural organization based in Amsterdam, The Netherlands. This project which started according to Willem Velthoven, director of Mediamatic, with a typographic matchmaking operation between western and Arabic typeface designers finished to produce an entirely Arabic version of the HEMA[8], a traditional Dutch department store. Through a design contest and an exhibition Mediamatic produced and exhibited 150 new products that interpreted the current portfolio of the original Hema Store using Arabic elements; and the *re-design* of contemporary traditional Arabic artefacts in order to become part of a fictitious Hema's catalogue (Fig. 2). The project ended by promoting a critical debate on multiculturalism, immigrant integration and the cultural gap between eastern and western cultures in the Dutch society.

The interest of this successful project for the *transsociation* approach is that commercial artefacts proved to be a powerful platform to promote intercultural dialogue if we consider products, vehicles of culture and identity. At the same time, this experience revealed the potentiality of crosscultural collaborations and the capability to innovate the form of a traditional artifact when tradition is not seen as something fixed, but instead, drives its force and relevance from the capacity to transform itself continuously.

[6] In http://www.elephant-design.com/en
[7] In http://www.mediamatic.net/set-20008-en.html
[8] In http://www.hema.nl/nl-NL/over_hema/about%20hema.aspx

5. A tentative method

The relationship among producers and consumers during the production and exchange of products, services and communication in the framework of globalization continues to pose a series of questions for the design practice. While companies are already building networks and new forms of organisation to respond, for instance, to the needs of delocalizing their production, the organisation of the design process in relationship to this remains little explored, revealing an area of opportunity for the development of new approaches and methods which can orient the design practice to contribute for the increase of the benefits and to counterbalance the negative consequences (social and environmental) of globalization. In this way, it is our intention to propose the development of a method for what we are calling a *glocally* driven product-system innovation, which is based on the transdisciplinary association of design and anthropological approaches.

In synthesis, the new method aims at the promotion of a novel practice to support the emergence of new forms of cooperation between organizations, individuals and territories in a world where global and local knowledge is exchanged and defined by multiple markets and cultures.

Accordingly, if we accept the rejection of the notion of *centrality* as one of our premises, what we are proposing now with this method is fundamentally the aperture of the design process to all subjects that are part of a specific network involved in a process of value production, which will reflect in the end on the plurality of points-of-view suggested.

At first we would like to induce the disciplines of design and anthropology to a common reflective practice based on *uncertainty*, where there are no guarantees of which relations will be created and which multiple points-of-view will be used or renounced.

Secondly, we propose a sort of 'ordered anarchy' as a method of disciplinary *transsociation* that stimulates the use of open innovation[9] models that make possible the access to the so-called diffused creativity and distributed intelligence[10].

Therefore, we propose that this method and its further elaboration start incorporating and inventing tools that encourage the use of the following tentative guidelines in the design process:

a. *Openness*: to permit drawing ideas and experiences from external practices and incorporate them into a local set of conditions, adapting and combining them with local elements. Openness can also be seen as *open-ended* where the solutions can be constantly modified and upgraded.

   - For organizations, the possibility to open their research activities to external sources.
   - For designers, the possibilty to join crosscultural and pluridisciplinary teams.
   - For users, the possibility to join the design process by expressing their needs.

b. *Hybridization*: to stimulate new combinations of patterns that result in new practices and new ways of doing.

[9] 'Open innovation' is a term coined by Henry Chesbrough to promote the use of external ideas as well as internal ideas to accelerate the process of innovation.

[10] 'Distributed creativity' is a term that refers to the diffusion of creative behaviors in the society and by 'distributed intelligence' we mean, "the new distributed forms of knowledge and decision making due to the increasing computing potentialities generated by the internet." (Manzini, 2004).

- For organizations, the possibility to gain specific insights for innovation in culturally diverse markets and translate local knowledge into products and services for culturally divergent markets.

- For designers, the possibility to incorporate the research of best practices and cross fertilization practices in their creative process.

- For users, the possibility to contribute to the process by transferring fluid or tacit local knowledge.

c. *Feedback*: to incorporate observations, concerns and suggestions which will transform the original solution.

- For organizations, the possibility to incorporate mechanisms in order to reduce risks.

- For designers, the possibility to validate the proposed solutions with final consumers.

- For users, to collaborate or to *co-design* with designers.

Finally, we suggest that the review of the material analyzed by anthropology can migrate to the disciplinary universe of design.

6. Preliminary experiences

This paper refers specifically to an ongoing PhD research[11] carried at the Indaco and Best Departments of the Politecnico di Milano University and also relies upon the Anthropology of Warfare research conducted within the Post-Graduate Program in Social Anthropology at the Universidade Federal de São Carlos, Brazil.

Nevertheless, the *transsociation* approach, has been experimented within some didactic activities through a series of three workshops conducted between November 2007 and May 2008. One of the objectives was to experiment with a new set of tools (a work in progress) that would introduce the incorporation of multiple points-of-view in the design process, specially in the *metadesign*[12] phase.

The first workshop named 'Transpark: ideas for an Ecomuseum in the *Parco Agricolo Sud di Milano*' was conducted[13] in November 2007 with 1st year students from the Master in Industrial Design of the *Politecnico di Milano, Facoltà del Design*. In this workshop, students were asked to design new services ideas connecting the urban identity of Milan to the rural identity of the park through the mutual *contamination* of values, languages and experiences.

The second workshop named 'Super Glocal: design scenarios for the Glocal Supermarket' was conducted[14] in April 2008 with 1st and 2nd year students from the Master in Ecodesign of the *Politecnico di Torino, I Facoltà di Architettura*. In this workshop, students were asked to design

[11] "Design methods for cultural driven product-system innovation" (provisory title). Eduardo Staszowski

[12] If we take the design and *metadesign* subdivision of the design process described by Celaschi (Celaschi, F., Deserti, A., 2007), design is the organization of all the factors that compete to obtain a specific result and *metadesign* is the process of ideation and planning of the design process itself. In practice, *metadesign* can also be seen as the first phase of the design process, or the design of a method that will influence the design process as a whole. A phase that, in one hand, is responsible for identifying and analyzing the constraints defined by the context in question and, on the other hand, synthetizes opportunities that come out of it.

[13] Together with Beatrice Villari and Giulia Simeone

[14] Together with Beatrice Villari, Flaviano Celaschi and Angela De Marco

new product-systems by interpreting the supermarket as an interface between the global and the local spheres.

The third workshop named 'The *Wellcare* Card: service design scenarios for the wellbeing of the contemporary worker ' was conducted[15] in May 2008 with students from the Master in Strategic Design of POLI.design, Consorzio del *Politecnico di Milano*. In this workshop, students were asked to design solutions that would bring the security and functionality of the professional world into our private lives and the identity and freedom of our private lives into our professional world.

In the three above mentioned experiences students were introduced to two *metadesign* tools designed[16] to explore the *transsociation* approach:

- **Brainstorm idea matrix**: it is an interactive matrix, organized around different variables, which can be combined to help students to brainstorm within small groups. The variables in the matrix represent the deconstruction of the problem around the demands of a potential user. The matrix helps students to make choices by associating the different variables and construct different paths that will configure one possible solution (fig.3).

- **Metacards**: each metacard corresponds to the detailed description of each variable of the matrix used to create an idea. The metacards all together become a first set of *metadesign* decisions (or a set of guidelines) which will define the constraints and suggest formal solutions for the next phases of the design process (fig.3).

Briefly, this first experimentation and the initial results informed us that design students equipped with these tools were able to incorporate valuable research data into the design process, giving them more control over the ideation process and enabling them to organize and analyze the plurality of multiple points-of-view used to orient the metadesign phase

In conclusion, it appears to us that new opportunities for further research emerge for both anthropologists, designers and professionals from other disciplines who can benefit from the transdiciplinary association aimed at tackling the complexity of contemporary society in the perspective of a positive globalization process.

[15] In collaboration with Daniela Seloni
[16] In collaboration with Beatrice Villari

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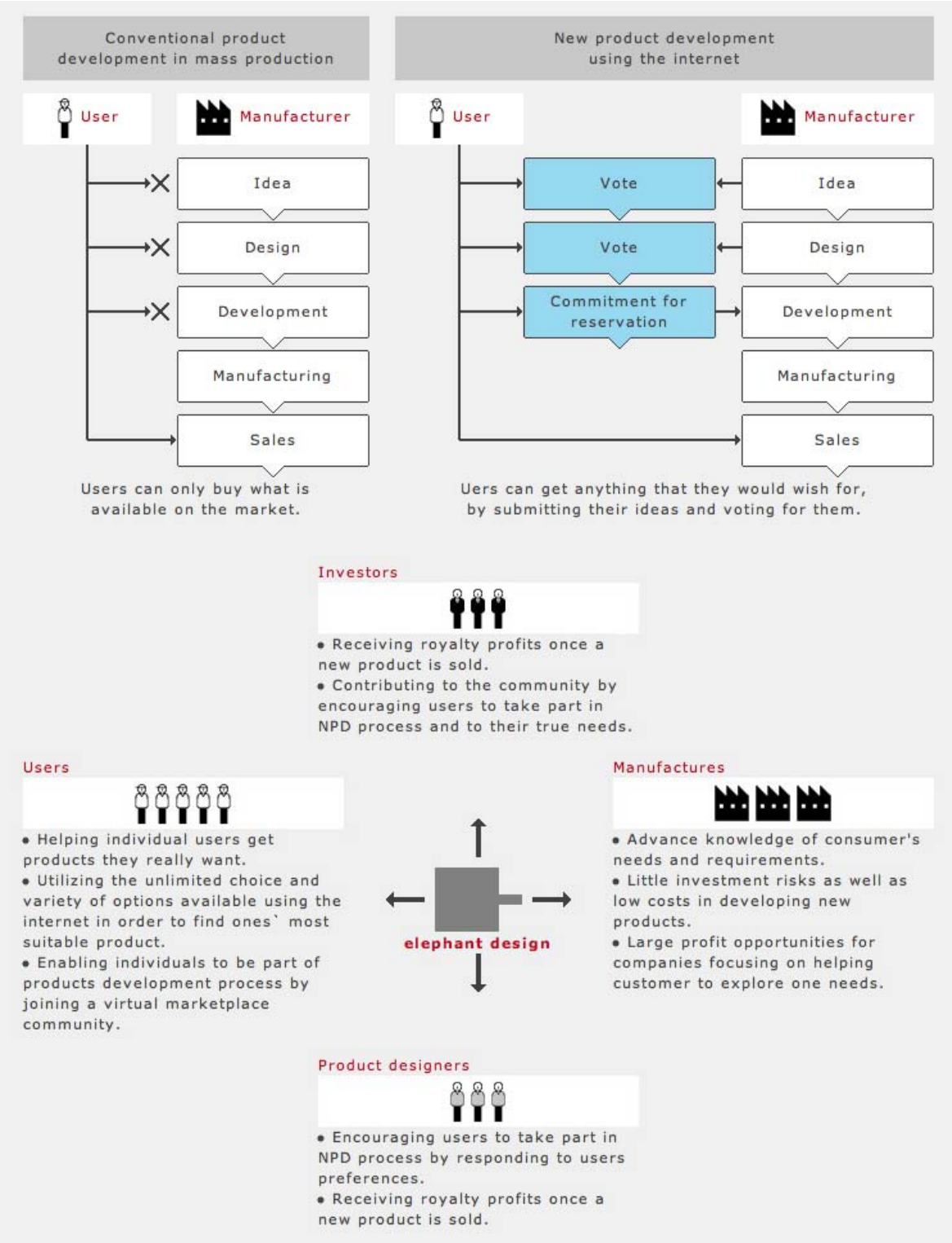
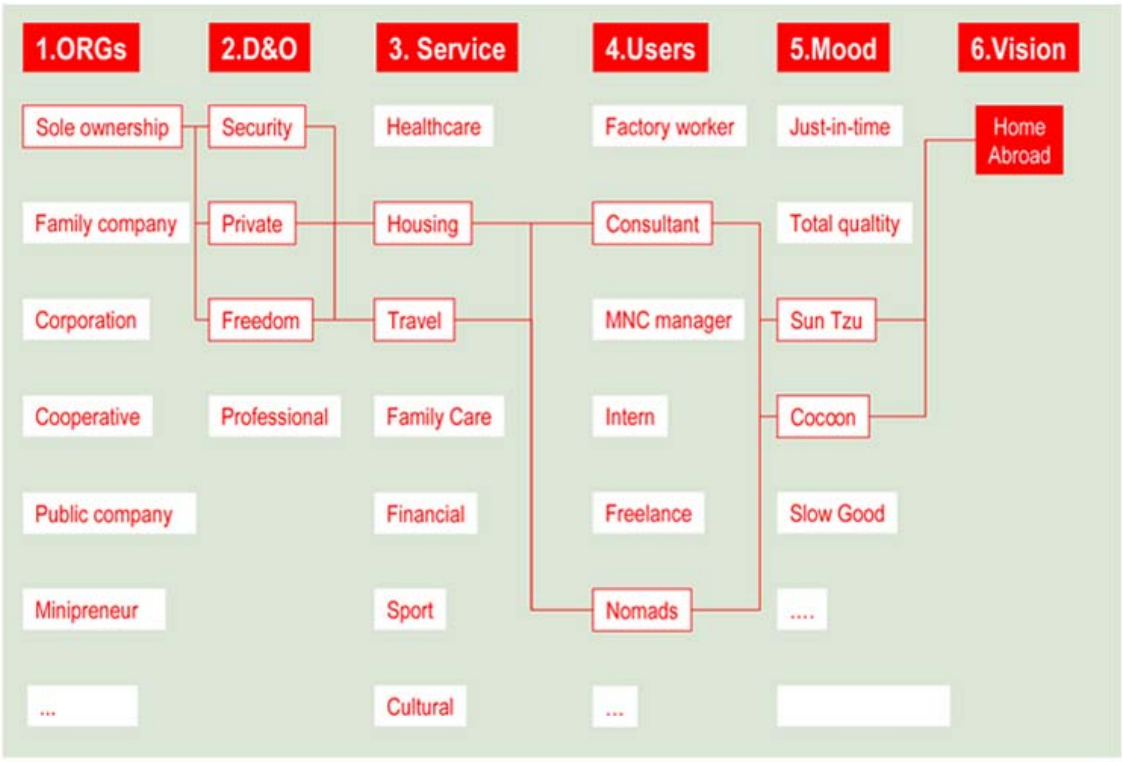


Fig. 1: The 'Design to Order' list of benefits according to Elephant Design. Image taken from their website

Fig. 2: The original Hema's logo and its Arabic version (top). Chocolate sprinkles (bottom), at exhibition 'El Hema', Mediamatic, Amsterdam, The Netherlands. Photo by M@pestaartje



*D&O = demands and opportunities

Fig. 3: The Brainstorm idea matrix and the Metacards set

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Slow Design Principles

A new interrogative and reflexive tool for design research and practice

Carolyn F. Strauss[1], Alastair Fuad-Luke[2]

Abstract

We posit a new evaluative tool to encourage design practices to orientate towards social, cultural and environmental sustainability under the rubric of 'Slow Design.'

The Slow Design Principles offer an opportunity to find fresh QUALITIES in design research, ideation, process and outcomes. The six principles of Slow Design are presented here as a powerful tool for designers to interrogate, evaluate and reflect on their design ideas, processes and outcomes using quantitative, qualitative and intuitive means of assessment.

'Slow Design' is a unique and vital form of creative activism that is delivering new VALUES for design and contributing to the shift toward sustainability.

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1. Toward a New Evaluative Tool for Design

In this section we discuss the need for new tools and strategies for evaluating design with a view to social, cultural and environmental sustainability. We posit that 'Slow Design' provides a stimulating platform from which to consider, critique and improve best practices in design, while simultaneously putting forward new ones.

What are the standards of evaluation in the field of design? And how, if at all, do they drive design practices to enable a more sustainable future?

The fields of science and engineering apply rigorous standards of evidence and evaluation to guarantee accuracy and 'quality' outcomes. Similar standards exist in the design field, with a focus on functionality, ergonomics, manufacturing efficiency, consumer safety and inclusivity. Since the mid-1990s, there has been a growing, voluntary analysis of environmental impacts in the fields of product design and architecture (for example, eco-design, Design for the Enviornment - DfE, and Design for Sustainability - DfS); however, such practices are not yet widespread and, furthermore, they are not a guarantee of behavioural change that can substantially deliver sustainability.

Recognizing the marginalization of this way of thinking about design, Fuad-Luke raised a rhetorical question whether 'slow design', an approach predicated on slowing the metabolism of people, resources and flows, could provide a design paradigm that would engender positive behavioural change (Fuad-Luke, 2002, 2003). The concurrent emergence of slowLab founded by Carolyn Strauss (Strauss, 2003-present) enriched the dialogue about the possibilities of 'slow design'. A wider public dialogue heralded the positive impacts of slowness (Honoré, 2004) and new conversations about 'slow + design' ensued (Mojoli, Manzini et al, 2006).

In 2006, we posited six Principles of Slow Design (formally reported in Fuad-Luke, 2008) – see below. These principles were the result of diverse research, dialogue and iteration within slowLab and its international network of design thinkers and practitioners. The principles were informed and inspired by others, including diverse 'slow activism' expressions (New Internationalist, 2002), the global Slow Food and Slow Cities movements and threads of the sustainability debate like the Dutch foundation Eternally Yours (van Hinte, 1997-2004) and projects associated with the Faculty of Design at Milan Polytechnic (Manzini & Jégou, 2003; Mojoli, Manzini et al, 2006).

We put forward these principles as an approach and tool for design. We do not regard them as 'absolute truths'; rather, they are GUIDING PRINCIPLES, open to dialogue, iteration and expansion.

2. The Slow Design Principles

Here we present the Slow Design Principles, each followed by concrete examples of design projects created by members of slowLab's network that demonstrate one or more of the principles in active use.

Those brief 'case studies' validate how the principles can work as a set of criteria against which the designer might interrogate and appraise her/his ideas, processes, motives, and outcomes. This should begin at the initial phase of any design project, with the designer returning to these criteria several times during the design process, and applying them again to evaluate the final design outcome and better understand its potential future impacts. In effect this creates a 'shifting brief' and a mutable outcome as the process unfolds.

We have found that the principles of Slow Design encourage and inspire a myriad of understandings, interpretations and uses. The process of applying them is a highly personal one. They provide a lens through which to more intimately understand one's own identity as a designer, to reflect upon the design processes one employs, to evaluate tangible outcomes, and to imagine new scenarios. This process of careful and continuous (self-)questioning challenges the designer to reach for the core of design and her/his role as a designer.

Note: In the description of each case study, we have **emboldened** words that we feel have particular resonance with the values, qualities and practices.

Principle 1: REVEAL

Slow design reveals experiences in everyday life that are often missed or forgotten, including the materials and processes that can be easily overlooked in an artifact's existence or creation.

Architect Karmen Franinovic (Croatia/Canada) uses situated interactive technologies in public architectural space to stimulate social interaction and raise awareness of the surroundings and their diverse ecologies. Franinovic's 'Recycled Soundscape' project (2003-04) [Fig. 1] was designed as a system through which to explore the auditory aspects of experience in the city through a set of "kinetic, human-scale interfaces" which seek to facilitate reflective activity in the public sphere. Within the sonic context of a specific location, people are invited to augment, modify and perform acoustic landscapes by playing with surrounding sounds, tuning the composition of a sonic environment, and listening to/recording noises (human, natural, machine, electronic) that are otherwise difficult to take notice of. The result is 'an interactive system for public orchestration of an urban sound ecology' where anyone can transform the existing sonic characteristics of a place over time, recomposing its 'evolving memory in sound'.' By introducing interactive technologies into physical architecture and immaterial space, she seeks in her work to stimulate **social interaction** and to raise awareness of the surroundings and its **diverse ecologies**. The under-observed phenomena of a locality are **re-revealed**.

In the realm of objects, Julia Lohmann (Germany/UK) believes that acknowledging the origins of a product is the first step towards making more informed and ethical choices about what we consume. The designer finds new applications for otherwise undervalued materials, working primarily with animal materials and byproducts. She designs objects on the threshold between the physical materials of animals and the animal itself, which **probe our attitude** towards the creatures we share the earth with and how we use them to sustain us. Sheep stomachs become beautiful billowing lights, triggering feelings oscillating between attraction and disgust, the former through their warm luminosity and the latter as soon as one learns more about

their material origins. Her ceiling light 'Flock' was made from the stomachs of fifty sheep and installed at the London Design Museum. Meanwhile, a series of unique handsculpted Cow Benches, each with a different name and shape, serve as **memento mori** for the cows that died to make the leather they are made from. The mundane, yet hidden materials of life are **re-positioned**.

Slow perspectives and practices have also emerged in the realm of today's virtual experiments. Tracy Fuller (USA), a Los Angeles-based game designer, has been working for the past several years to create gameplay that "slows the player down and allows time and emotional space for reflection and transformation." In her current work at the USC EA Game Innovation Lab, she is collaborating with artist Bill Viola on 'The Night Journey,' where the core mechanics of the online gaming experience unfold at the extremely slow pace and characteristic visually richness of Viola's celebrated video works (Fuller, 2007 to present). Meanwhile, by much simpler mechanisms, web-based projects 'Shredder' (Napier, 1998) and 'html_butoh' (Endlicher, 2006) reveal unexpected aesthetic pleasures embedded in the seemingly banal coding of Internet sites.

Principle 2: EXPAND

Slow design considers the real and potential "expressions" of artifacts and environments beyond their perceived functionalities, physical attributes and lifespans.

In her doctoral thesis 'Occupying Time: Design, Technology, and the Form of Interaction,' Ramia Mazé (Sweden) points out that, "Design is not only about the spatial or physical form of objects, but the form of interactions that take place – and occupy time – in people's relations with and through [them]. A central, and particular, concern of interaction design must therefore be the **'temporal form'** of such objects and the 'form of interaction' as they are used over time." (Mazé 2008) Her projects at the Interactive Institute in Goteborg included the 'STATIC!' which investigated interaction design as a means of increasing our awareness of how energy is used and for stimulating **changes in energy behavior**. Revisiting the design of everyday things with a focus on issues related to energy use, with the goal of creating a meaningful presence for energy in daily life. (Mazé, Redstrom et al, 2004-05) Her thesis work also considers larger currents in how design permeates daily life, staing that "Increasingly, pervasive technology means that the temporality of form and interaction is implicated in more widespread changes to the material conditions of design and of society. Challenging conventions – of 'formalism' and 'functionalism', 'good' and 'total' design – temporal concerns and implications require new ways of thinking about and working with the **materiality**, users, and effects of design."

German designer Monika Hoinkis is similarly concerned with how we "live with things," but whereas Mazé addresses temporal concerns, Hoinkis searches for **intimacy** and interdependence with the objects around us. In 2005 she created a collection of objects that function only in direct reciprocity with their users: A desk lamp without hinges that begs to be cradled in a cupped hand. An umbrella that stays up only with help, draping over one's head and shoulders. A radio that functions solely in close proximity to a warm body. A metronome that, rather than dictating a beat to follow, instead keeps time to the rhythm of the person who shares the room with it…. As opposed to objects performing discreet functions, Hoinkis' objects must be negotiated with in order to benefit from their full functionality, challenging those who use them to reflect upon whether the other "things" in their lives could have similar **symbiotic dependencies**. (Hoinkis 2005)

The processes of making products are also shifting to reveal new possibilities. Australian engineer and artist Natalie Jeremijenko (Australia/USA) leads an academic initiative for design

and engineering students to trace the histories of everyday products, creating encyclopaedic entries that comprehensively **expose the life of the products**, from where materials are sourced to the labor conditions of those who manufacture them (Jeremjenko et al, 2005 to present). Participating students acquire healthy tools for critiquing consumer culture, as well as new ways of thinking about and executing their own design projects.

Such a rethink is evident in Olivier Peyricot's automobile concept, 'Slow Rider,' where a standard automobile is deconstructed and rebuilt as a purveyor of slow living. Peyricot (France) mounts a stripped-down motor on the back of a vehicle or exchanges it with a refrigerator generator, literally reducing power to **facilitate slowness**. The hood is removed and the chassis sawed down to make way for front-mounted seats. In motion, such a car roams the city like a motorized flâneur. At rest in a parking spot, the car becomes a piece of street furniture that invites the public to relax or **play** on its surfaces.

Principle 3: REFLECT

Slow Design artifacts/environments/experiences induce contemplation and what slowLab has coined 'reflective consumption.'

Product designers are questioning not only ecological values, but also perceptual and emotional experiences that the unique materiality of products can deliver. Dutch designer Simon Heijdens believes that design should, like Nature, unleash a **continuum of expressions** over time. With his project 'Broken White, Heijdens created ceramic dishes that evolve over time to reveal visible **traces** of their relationship with the individuals who use them. As they facilitate the consumption of food and drink over many months and years, the smooth white plates, cups and bowls develop tiny cracks that slowly, very slowly, reveal intricate floral patterns. The varying states of adornment on each plate or cup directly reflects the relationship with its owner, so that his/her favorites have the greatest wealth of decoration while others may remain quite plain. In a world of disposable products, Heijdens embeds new layers of experience into everyday objects, enriching their meaning well beyond mere function and convenience, and thus rendering them increasingly precious to the user over time.

The London design collective Raw Nerve had something similar in mind when they rescued the dilapidated piece of furniture and brought it into their studio. Over time, they began to contemplate its former life, imagining the **impressions** that the sofa may have absorbed, the stories it had heard, secrets whispered, urgent young lovers languishing in its folds. They thought that it might have served as a child's castle and envisioned a collection of lost objects buried in its depths. They saw the sofa not as an inanimate object, but as a living, breathing thing with its own life and its own story to tell. The designers set to reviving that rich history, re-upholstering and imprinting upon it the imagined tales of its life so far. To unravel the secrets of its past, one must interact with the sofa, examining every intimate detail, lifting its cushions and listening intently to soft sounds emitting from deep within. The sofa has moved beyond being a mere functional object to being a **site of discovery**, infused with **layers of meaning** that challenge and delight those who come to sit on it.

While such projects strive to achieve physical and emotional durability, Icelander Katrin Svana Eythórsdóttir (Iceland) explores the **preciousness** that is born of **ephemerality**. Her biodegradable 'Chandelier' (2006) slowly disappears over a period of several months, inviting its owner(s) to savour every moment of its existence. Comprised of a cascade of thousands of highly

reflective glucose droplets, this magnificent light source requires no electricity. The highly reflective nature of the material draws in ambient light and refracts it back out from the object, casting a subtle, warm glow. Lasting only up to three months (perhaps even less if one's local insects opt to collaborate), the ephemeral nature of Eythórsdóttir's Chandelier induces a state of awareness and deliberate contemplation of the object's attributes, functionality and, not least, it presence in one's life. The very lightness of the physical form suggests an ephemerality as well, appearing and disappearing as the light around it changes. Eythórsdóttir says, "It hardly exists, yet it's there."

Principle 4: ENGAGE

Slow Design processes are open-source and collaborative, relying on sharing, co-operation and transparency of information so that designs may continue to evolve into the future.

Collaboration is a critical aspect of slow designing. This is perhaps what industrial designer Martin Ruiz de Azua (Spain) had in mind when he designed his 'Human Chair,' a group of people sitting on each other's knees, propped one on top of the other in friendship and **fragile dependency**. It is 'human', referring not only to the people who are its component parts, but more importantly to the delicate nature of the exercise. At any moment, the 'chair' could collapse, but then it could just as easily be rebuilt again, perhaps with a few more friends joining in. With this simple project, Ruiz de Azúa has given the precious gift of **immaterial substance** to our over-material world: a design 'object' that has no object unless people work together to create it in amity and fun.

Few understand the value of interdependency as well as the folks at the Rural Studio, a design/build program within the School of Architecture at Auburn University that creates homes and civic structures in Hale County, Alabama The projects rely on forging deep connections and **collaborations with the local community** to ensure that **place-based values** and identity are at the core of their architectural projects. The late Samuel 'Sambo' Mockbee, who founded the program, called for "**socially responsible architecture**... to inspire community, or stimulate the status quo in making responsible environmental and social structural changes now and in the future." (Mockbee 1998). He felt is was important that students be involved with materials investigations and technologies which have mitigated the effects of poverty upon rural living conditions. Students engage in"**context based learning**" where they actually live in and become a part of the community in which they are working. Structures are made from **affordable, local materials--** clay, waste materials, recycled glass, scrap metal-- with the students, too, living in structures reflecting the **visual vernacular** of the place as they they learn the critical skills of planning, design, and building in a socially responsible manner. In 1998 Mockbee stated that "The professional challenge, whether one is an architect in the rural American South or elsewhere in the world, is how to avoid being so stunned by the power of modern technology and economic affluence that one does not lose sight of the fact that people and place matter." (Mockbee, 1998)

Principle 5: PARTICIPATE

Slow Design encourages users to become active participants in the design process, embracing ideas of conviviality and exchange to foster social accountability and enhance communities.

With it's project series, 'Slow Ways of Knowing,' the design collective slowLab (USA/UK/Netherlands) has developed an urban design tool to capture local knowledge and elicit public contributions to urban planning debates in their localities. Through **empirical observation, sensory awareness and intuitive imagining**, people are invited to connect with the histories and patterns that a given site reveals. To capture **local knowledge** and public imaginings about the evolving identity of the neighborhood or surrounding area, they are encouraged to annotate local area maps with their thoughts, memories, sensations, fantasies, drawings, and design gestures. By thus revealing unseen or forgotten aspects of those places, generating awareness and participation, the projects remind people of their own part in and responsibility to the life of their localities, and are encouraged into ongoing creative investigations.

In a similar vein, the Netherlands-based social design collective Butterfly Works believes that "structural improvement in people's lives is possible when people have the necessary tools of creativity." The collective has been recognized for their work in several African nations, co-designing new programs with **local makers** and producers, with the ultimate goal of stimulating people to start projects themselves. With 'NairoBits,' Butterfly Works initiated a digital design school in Kenya to train young people from the slums as web designers, with complete transfer of knowledge and responsibilities to Kenyan managers and teachers. While their 'Tyre Trade' project in Morocco got local manufacturers to collaborate on the creation of baskets out of discarded rubber tires, which are now being used locally as well as sold at design shops in Europe. The motto of Butterfly Works multidisciplinary approach is **"Positive Chain of Events."**

Meanwhile, London-based designer Judith van den Boom of Studio Boomwehmeyer strives to bring human relationships to fruition within the processes of manufacturing her own ceramic designs. She proudly goes "below the surface of plain production" in her product development to explore **"warm relationships"** with manufacturers, as evidenced by her current collaboration with a large manufacturer in Tangshan China that includes design workshops and poetry readings with factory workers. (Van den Boom, 2008).

Principle 6: EVOLVE

Slow Design recognizes that richer experiences can emerge from the dynamic maturation of artifacts, environments and systems over time. Looking beyond the needs and circumstances of the present day, slow designs are (behavioural) change agents.

With 'Edible Estates,' architect and social designer Fritz Haeg (USA) proposes the replacement of the American lawn with a highly productive domestic edible landscape. With the modest **gesture** of reconsidering the use of our small individual private yards, Edible Estates takes on issues of global food production, our relationship with our neighbors and our connection to the the natural environment. Haeg is concerned not only with the short-term gains for participants, but also with how this system works as a tool for reorganizing neighborhoods, instigating new community relationships, and reviving the social commons. **Community stewardship** of the project into the future will determine its evolution over time.

Community stewardship will also be key to the ongoing thriving of Louis Le Roy's Eco-Cathedral in Mildam, Netherlands, [Fig. 2] which he expects to endure for at least another 1000 years. It is a site of creative actiivism and **construction of new realities** begun by Le Roy over thirty years ago as a design experiment to demonstrate the potential of human energy interacting

with the forces of nature. There, on a two-hectare site, he has piled up with his bare hands paving bricks, paving stones, kerbstones and other discarded street rubble while allowing nature to proceed about him unhindered. Le Roy calls this fascinating jungle populated by large stacked edifices a ‘cathedral’ in reference to the people who built the great cathedrals and architectural complexes of the past— most of whom probably never saw the projects to completion in their lifetimes. Le Roy believes that “employing all the potential available from all human beings would provide a mega-source of clean energy.” He says that, using such a method, a new habitat could take shape in which everyone could participate creatively in building a **living environment** without a ground plan and without the boundaries of private property. Following his ideas would mean a revolution in designing urban space. The project has spawned a foundation, Stichting Tijd (The Time Foundation) to ensure that longevity while promoting insight and knowledge of the notion of ‘time’ as a condition for the creative development of cooperation between natural and creative human processes. Le Roy says, “The methods of today’s planners will not prepare them for the enormous problems that they will have to face in the next century. One of the first things they have to do is accept **infinite time** within their thinking system.”

3. Case Study: The Slow Design Principles applied as a Re-design Tool in a workshop setting

In adddition to challenging individual designers, the Slow Design Principles can also be effectively applied as a collaborative tool for groups of designers and users alike to evoke new understandings and reinvigorate their design values.

In April 2008, Alastair Fuad-Luke tested this angle in a workshop he led at the Research in Art, Nature & Environment (RANE) research cluster at University College Falmouth. The workshop entitled 'Slowly Re-designing Now' engaged nine participants[3], ranging from fine art to design and architecture researchers, post- and under-graduates. The workshop proceeded in the following steps:

1) The text of each 'slow design' principle was shown to the participants and each one was asked to donate a word to form a 'word circle'. Once the circle was complete then each participant then had to join up two words with one line. This generated a participatory lexicon for each principle.

2) Working in groups of three, the participants were then asked to examine a conventional plastic (1.0 or 2.0 litre High Density Polyethylene, HDPE) milk bottle ubiquitous in UK supermarkets and generate ideas/concepts for its re-design using the word circles representing each principle.

3) The groups present their ideas/concepts and articulated their feedback in a closing discussion.

4) At a later date, Fuad-Luke collated the ideas/concepts into a series of concept sketches, under the fictional brand 'Milkota' [Fig. 3].

1) Feedback from the exercise: word circles

The word circles gave the participants a sense of ownership of the principles and, joining the most important words with a line, gathered the group around important ones for each principle:

[3] Rowena Arden, Rod McLaughlin, Steve Bond, Anne Roberts, Nick Swallow, Bunk, Lisa Fuller, Morye Mamie, Alex Glanville

Reveal – Pause, interval, awareness

Expand – Elastic, being

Reflect – Understanding, natural, calm, contemplate

Engage – Listening, rhythm, communicating

Participate – Love, flourishing

Evolve – Journey, growth, process

2) Mutual learning to generate concepts/ideas: re-designing the HDPE milk bottle.

Key ideas and concepts emerging from the group discussion were:

Reveal – reform the bottle to show the source of the milk, a cow's udder and teats; label on the bottle to explain more about the source (cow, farmer, etc)

Expand – included 'bright ideas' on the side of the bottle; a refund on returning the empty bottle; show possible second-life uses for the bottle

Reflect – this group raised a number of rhetorical questions – Impact of the dairy industry? This is a ubiquitous product but do we need it? If we didn't have it would the other be better? If it continues to exist how can we find better uses for the used bottle?

Engage – again more questions were raised than answered. The most important question was 'Listen to whom?', in a sense enquiring as to who are the actors and stakeholders.

Participate – the group quickly moved to the idea of keeping different materials separate to facilitate recycling of 'mono-materials'.

Evolve – a plethora of ideas was generated on getting second-life uses out of the bottle, e.g. embossing cutting plans on each bottle for a different second-life use or useful measure units for cooking; techniques for cutting and combining the HDPE into other structures (woven, joined).

3 and 4) Design freshness – the value-added of the slow design principles

Outcomes from each group were synthesized into a new design concept [Fig. 3]. Key components of the design include:

a point of sale system that uses passive cooling through evaporation in a terracotta stand-alone cooler that does not require electricity but only requires topping up of the water reservoir.

point of sale systems only available for the sale of *local organic* milk (farmers within 15-20 kilometres) – can be purchased by farmers, farmers co-operatives, shops, and other outlets.

re-usable, re-cyclable thick-walled HDPE bottle that is returned and washed

two detachable components (the top and bottom) enabling colour coding for nutritional/health consumption, making it an 'iconic' design statement in the home – endorsement of the economic system i.e. local is beautiful and viable.

The resulting new brand 'Milkota' represents an improved solution in terms of: eco-efficiency; a better profit share to the farmers, farmers co-operatives and local retail outlets; a local identity milk point-of-sale and recycling system; desirability and eco-iconic status for consumers (signals we support local, fair trading for farmers, we like functional yet 'high design' objects in our lives).

'Milkota' represents a concept with potential for development, one that is grounded in the guiding principles of slow design and that is owned by the participants of the workshop. It represents a different metabolism from the commercial, supermarket model of 'single-use' HDPE milk bottles.

Impressions of the workshop

This workshop successfully demonstrated the efficacy of the Slow Design Principles to facilitate mutual ideation and learning. One of the participants noted. "I'd forgotten the importance and power of words to communicate, to generate strong emotions and guidance." Another acknowledged how the principles had ensured that the object (the milk bottle) revealed itself as part of a larger (milk supply) system, whose efficacy and social equity had to be examined in order to re-design the object. All agreed that the Slow Design Principles allow us to re-adjust our sights, re-evaluate our design values, and bring fresh qualities to our design outcomes (and their legacy for future generations).

4. Slow Design: New Values, Qualities and Practices

We posit Slow Design as a unique and vital form of creative activism to deliver a new set of values, qualities and practices of design. These seem to gather around several inter-related themes, as suggested by our emboldened words in section 2, above. They include:

Shifting awareness and perceptions by creating new awareness (sensory, symbolic, holistic), probing our attitudes, re-positioning the unfamiliar or fogotten, playing with time (temporal form, time in design, facilitating slowness, designed for ephemerality), playing with materials (questioning materiality, the intimacy of material and symbolic layers of meaning), challenging beyond materiality (immaterial substance).

The **values move beyond the materialized object**…stimulating our intuitive imaging while concurrently making empirical observations or invoking a site of discovery.

Focus on **locality, community and Manzini's "local potential"** – materials, needs, community; expose the explicit and implict rhythms of people and place, markers of local identity, community stewardship, and affordability. Mapping local knowledge in new and unexpected ways and then incorporating those values into new planning decisions. Designing to enable social connections and community. Leveraging place-based knowledge.

The long view- a continuum – infinite time

Reciprococity with the human and natural based environment – context-based learning, respecting diverse ecologies, symbiotic dependency. Slowing resource consumption.

Honoring 'slow knowing'/the slow mind: "a type of intelligence associated with what [is called] creativity, or even wisdom." (Claxton), perhaps encouraging more value association with 'slow knowledge' (Thorpe, 2004).

And many more...

5. Conclusion: A Call to Slow Designers

The Slow Design Principles offer a flexible, pluralistic approach for designers to gently evaluate themselves as to the true purpose of their design activities.

With this publication, we hope to encourage a larger movement of designers who embrace these emerging (slow) values, explore fresh qualities in and step forward to declare themselves as "slow designers."

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Fig. 1: Karmen Franinovic, ‘Recycled Soundscape’

This photo: Installation at Place Igor Stravinsky, IRCAM, Paris (France) 2004

Fig. 2: Louis Le Roy, ‘Eco-Kathedraal’

This photo: "The living that lives..." Concept: Pierre Mansire, Dance/Improvisation : Moeno Wakamatsu

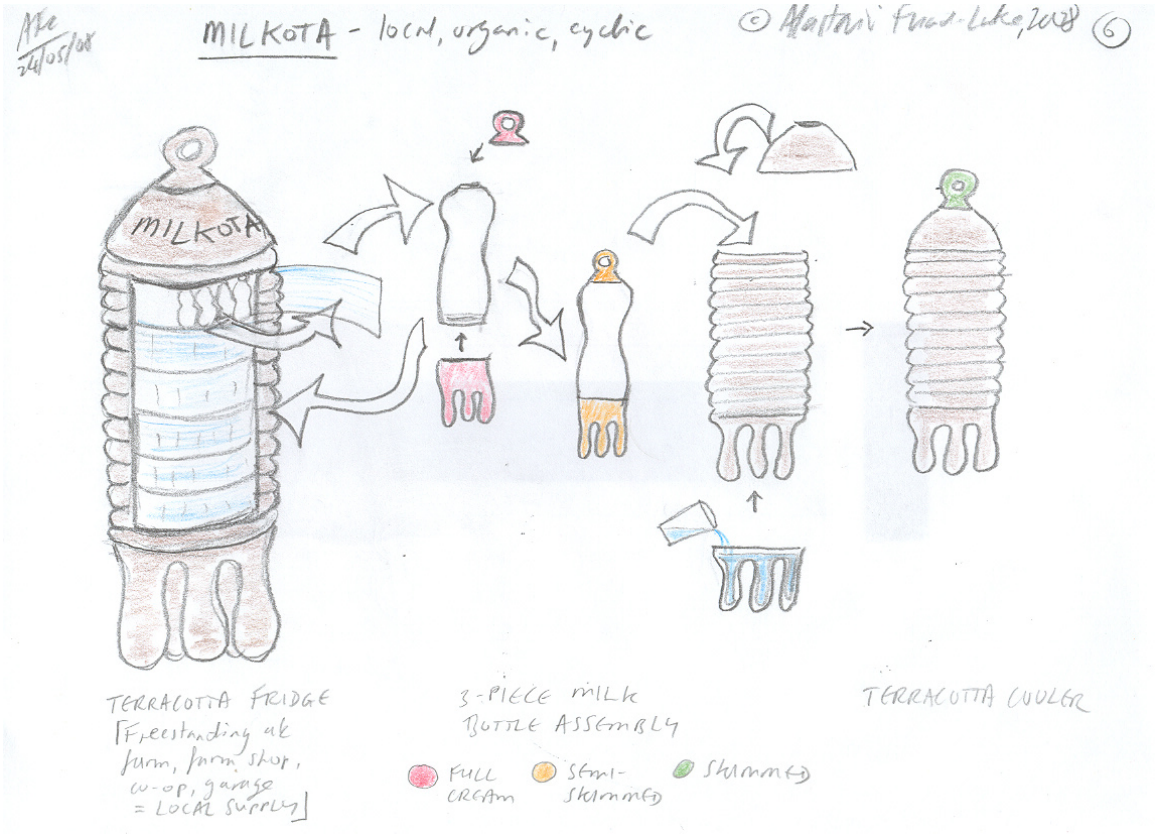

Fig. 3: Fuad-Luke et al, ‘Milkota’ design sketch resulting from April 2008 workshop 'Slowly Re-designing Now' t

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design in Public Sector Services:
Insights into the Designs of the Time (Dott 07) public design commission projects

Lauren Tan[1]

Abstract

For design to have a positive impact on the lives of people in our complex and changing world, it must work towards social and environmentally sustainable outcomes for business and the public sector. Many initiatives to demonstrate the value and role of design in this changing context have been launched, acting as experimental ecosystems for Designers to work and explore within, for example the 'Designing for Services' project at Saïd Business School, University of Oxford (Kimbell and Seidel, 2008). The biggest and most recent initiative undertaken in the UK to date has been the Design Council's, Designs of the Time (Dott 07) programme , which took place in North East England between 2005 and 2007 (Thackara, 2007). Dott 07 was an extensive demonstrator of design in the context of designing and developing sustainable public sector services. The public design commission projects tackled issues in the areas of health, education, food, movement and energy. Each project utilised design-led interventions to involve communities in developing public sector services, and in doing so, sought to leave behind a legacy of people-centred and sustainable outcomes. The Dott 07 initiative presents an important opportunity to critically reflect on the value and potential of design in public life.

This paper describes research within a current PhD programme, which aims to understand the contribution that demonstrator initiatives, such as Dott 07, can have on the embryonic discipline of service design. It seeks to do this though identifying key aspects of design methodology and practice utilised in the Dott 07 projects. This paper concentrates on the first, of two qualitative research phases. Each phase involves a critical reflection on the Dott 07 public design commission projects, using a case study method, based on semi-structured interviews with selected stakeholders involved in the projects.

The first phase looks at the project clients as stakeholders. Analysis of this interview data reveals that the design methodologies and practices utilised in the projects have made significant contributions to the legacy of Dott 07. This legacy can be seen as both visible, and embedded in the individuals and communities involved in the projects. The interview data also identifies emerging indicators for design in public sector services, and the paper will begin a discussion on these findings. The paper will conclude by outlining the second research phase, now underway, with the Design Teams of the Dott 07 public design commission projects.

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Introduction

This paper, in the context of the Changing the Change Conference attempts to illustrate how design methodology is changing in and of itself, as Designers decide to pursue new and different situations. It uses a case study of the Designs of the Time (Dott 07) programme to reflect on design methodology applied in a social context, publicly commissioned and often with intangible outcomes.

At the time of writing this paper, the main body of research is still a work in progress with the majority of interviews for the data collection completed. It is for this reason that this paper can only start the conversation for indicative conclusions to a growing body of knowledge situated within a PhD programme. It is hoped that this paper will illustrate insight and reflection from research gathered thus far. The paper will draw upon research gathered from both Designers and project stakeholders involved in the Dott 07 programme which was run in the North-east of England between 2005 and 2007. The programme[2], co-sponsored by the Design Council, London and the regional development agency OneNorth East, looked at demonstrating how design and Designers could tackle social issues in five broad areas of:

- Health;
- Education;
- Transport;
- Energy and;
- Food.

The programme identified communities who were keen to learn new approaches to solving social issues and connected them to Designers who had a passion for people and stretching design beyond its narrow definitions of product, fashion, graphics, web, interior etc. The programme, in its entirety, was made up of several components, but the focus of this research has been on a suite of seven public design commission projects. These projects, sponsored by public sector agencies, utilised design-led interventions at a local community level to tackle the five big themes. Each project was unique and different from the others. They therefore varied in their outcomes and impact on the people involved and wider community. The research conducted thus far has included desk research, a literature review, informal dialogue with Dott 07 stakeholders, experiencing Dott 07 events and semi-structured interviews with design teams and selected project stakeholders. In order to provide the backdrop for the discussion in this paper, a brief description of the seven public commissions projects is provided below.

Alzheimer 100

In this project, Designers of public service and communication design firm, Thinkpublic, explored with the Alzheimer's Society, ideas around how people with dementia and their carers could access better services to improve daily life and have a voice to communicate stories of people with dementia. Some outcomes and ideas that emerged from this project included skills

[2] Dott is a ten-year programme, to be initiated every two years in a different region of the UK. Each Dott consists of a suite of public commission projects utilising design-led interventions to "involve the public in designing solutions to local problems" (Design Council, 2006).

building in film-making, production of a film illustrating the daily lives of people with dementia and their carers, a Signposting service to help navigate vast and disparate services available to the Alzheimer's community and a Wondering Garden for people with dementia[3].

Design of Sexual Health (DaSH)

Sexual health services for young people are difficult to access in Gateshead and discouraging for use. The Designers from Design Options gathered insights from young people in Gateshead and proposed a set of solutions to address key issues in accessing sexual health services. This included ideas for the development of a new Genito-Urinary Medicine (GUM) Unit[4].

Low Carb Lane

What began as designing ways to reduce the carbon footprint of a home, ended up being a financial service for tenants. Through insights gathering, Designers at service design and innovation firm, live|work, discovered that in low socio-economic areas such as Ashington, financial issues needed to be tackled before the environment could be addressed. The Designers developed a service that linked energy use to finance by providing a Saverbox financial package for tenants. Tenants would also be able to monitor energy use and financial information on an energy 'dashboard' through their TV[5].

Move Me

In the village of Scremeston, access to transport is a challenging issue. The Move Me project involved Scremeston locals and school children from Scremeston First School to see what they could do to increase the mobility of people, while having as little effect on the environment as possible. Designers from live|work came up with a Lift Share service that provided the community with communication tools, such as a central notice board and lift share cards, to help bring people together to share rides[6].

New Work

Many businesses in the North-east are micro businesses (ie. 4 people or less). Enabling Concepts and live|work helped micro businesses identify key issues, such as social isolation, and helped them design solutions to overcome them. The design team brought together a community of micro business owners helping them to brainstorm and prototype several ideas[7].

Our New School

[3] The Alzheimers Society in the Northeast are currently pursuing ideas and ways to maintain the participation of people with dementia and their carers in future initiatives and activities.

[4] A GUM Unit is currently being built in Gateshead, incorporating ideas from the DaSH project.

[5] The Saverbox concept is currently being realised in North-east England with additional funding and resources being provided by One NorthEast and other public sector agencies.

[6] The Lift Share service is currently being rolled out in a number of schools and many other opportunities to develop the service are currently underway.

[7] The community of micro businesses still exists today, mostly via a social networking website developed especially for them.

The UK Government committed £3 billion, through the Building Schools for the Future programme, to maintain and improve buildings in all secondary schools throughout the country[8]. Designers from service design firm, Engine, helped Walker Technology College (high school students, teachers and parents) develop a vision for their new-build that would see the building facilitate learning, rather than the other way around. The project produced a brief[9] that brought "clarity and completeness" (Collier, 2008) to the vision of the school for the new build, mapped the 7-year journey of high school students to identify support and decision points along the way and developed a board game to facilitate a similar process for other schools also to receive BSF funding[10].

Urban Farming

In the Urban Farming project, a TV producer, artist, and service design firm, Zest Innovations, looked at reducing food miles by getting Middlesbrough residents involved in growing food locally (at home, work, in public spaces and/or in allotments), preparing the locally grown food as meals and celebrating the process at a community Town Meal event which brought people together to celebrate, cook and eat the locally grown food[11].

Why we should reflect on design methodology

Design methodology lays the foundation for how designing is done. It allows non-Designers to understand what is being done and enables the design community to develop ways to have an even greater impact on people and situations. Charles Handy (1993) provides us with a story on the value of being conscious of what we do:

> "I am reminded by a student on a management development programme. He had made half-a-million pounds by his own efforts by the time he was 35. 'Why are you coming here as a student?' I asked him. 'With your success record you should join the faculty.' 'Not so' he replied, 'I have come to find out why I was so successful.' He understood that if he could not explain his success he could not repeat it." (Handy, 1993: 18)

In order to reflect on design, we must attempt to understand methodology. Design theorist, Nigel Cross (1984) states, "Anyone who wishes to reflect on how they practice their particular art or science, and anyone who teaches others to practice, must draw upon methodology" (Cross, 1984: vii).

The viewpoint of design methodology in this paper and the broader PhD programme has been largely framed and guided by the author's own experience in design practice[12] and by the definition of design methodology that Cross (1984) provides where he states that design

[8] Teachernet, Building Schools for the Future. http://www.teachernet.gov.uk/management/resourcesfinanceandbuilding/bsf/

[9] A document called, 'Dear Architect'.

[10] Walker's architects have produced drawings and plans based on the 'Dear Architect' brief and the school has experienced a high level of interest throughout the UK on the Our New School process and its potential for implementation in other schools.

[11] With an expected turn out of 300, and an actual turn out of 8500 people, the Town Meal will be run again in 2008, as one initiative of several, that Middlesbrough Council will be running around issues related to food

[12] This has included design used in organisational strategy, customer experience and services.

methodology is "… the study of the principles, practise and procedures of design in a rather broad and general sense." (Cross, 1984: vii). It is important to make a distinction between methods and process for the purpose of discussion in this paper. In this paper, design methods are known as the different tools that Designers use as they move through the design process. The design process is the broad sequence of design phases over time. How methods and process relate is that design methods populate the design process.

Research into design methodology in Dott 07 has therefore been broad in scope, but deep in its discovery of the project experience from both Designers and project stakeholders. One Designer broadly captures the use of design methodology in Dott 07 saying:

> "… the process is the most important thing about design. It's what it is. It's the journey of all the different stakeholders, the community, the students, the teachers, the Designers. It's how we figured things out, why we figured things out." (Lee, 2008)

A very brief history on design methods

Design Methodology only began to be paid serious attention in the 1960's[13] (Chris Jones, 1992: xviii). Over its 40-year history, the dominant view of design methods has moved through different schools of thought, beginning with very scientific views and approaches of design methodology, which reflected the types of problems Designers were solving at the time. These problems were complicated rather than complex and a reductionist approach to design methodology seemed adequate (RED, 2006; Bayazit, 2004; Chris Jones, 1992; Cross, 1984).

Since then, design problems continue to reflect our social, economic and environmental context. The approach of the design process in the 1960's was recognised as, "simplistic, not matured enough, and not capable of meeting the requirements of complex, real-world problems" (Rittel in Bayazit, 2004: 21). These complex problems were what Rittel called "wicked problems"[14] (Rittel and Webber, 1973). The need to take the "wickedness" out of the wicked problem (Buchanan, 1992: 16) gave rise to "user involvement in design decisions" (Rittel in Bayazit, 2004: 21) ensuring the participation of users in the design process.

Design methods for participation were highly utilised in the projects of Dott 07 but a broadening has occurred as to who participates in this process. The design teams of Dott 07 sought to not just focus their attention on the end-users of design outcomes, but also co-designing (RED, 2006: 13; Albinsson and Forsgren, 2005: 131) with the direct stakeholders of the project, usually those in the leadership and delivery of services to the public[15]. The inclusion of

[13] The very first conference on design methods was held in London in 1962 and was titled, *The Conference on Design Method*s.

[14] Horst Rittel, defined wicked problems as: "1. having no definitive formulation, but every formulation of a wicked problem corresponds to the formulation of a solution; 2. Wicked problems have not stopping rules; 3. Solutions to wicked problems cannot be true or false, only good or bad; 4. In solving wicked problems there is no exhaustive list of admissible operations; 5. For every wicked problem there is always more than one possible explanation, with explanations depending on the Weltanschauung (intellectual perspective) or the Designer; 6. Every wicked problem is a symptom of another, 'higher level' problem; 7. No formulation and solution of a wicked problem has a definitive test; 8. Every wicked problem is unique." (Buchanan, 1995: 14-15)

[15] Albinsson (2005) who uses principles of co-design for innovation within organisations and stated that co-design was about not just about including the end-user in the process, but people within the organisation and/or in management

the direct project stakeholders is where the focus of this paper, and the broader PhD research is anchored[16].

A snapshot of design methodology today

Many design consultancies and design-led organisations have formed their own models of the design process (Figure 1). These include, The Design Council's Double Diamond model[17], Design Innovation Education Centre's (DIEC), Marketing-Fusion model[18], The Mayo Clinic's SPARC[19] model, Carnegie Mellon's User-centred design methodology[20] and models conceived by design consultancies such as those developed by Live Work, Engine, Zest Innovations etc.

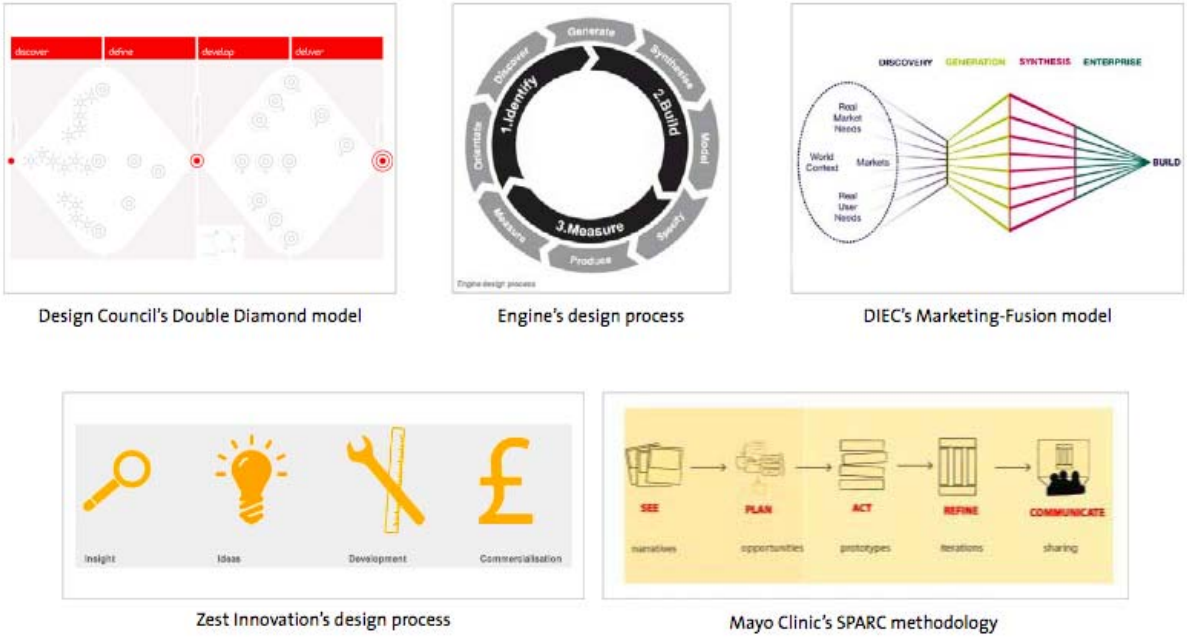

Figure 1. Some models of the design process

(Albinsson and Forsgren, 2005: 131). RED (2006) described co-design in one of their case studies where "Angela wasn't simply the subject of research but an active part of the RED design team. She helped develop ideas, commenting on and participating in a number of prototypes, and making real time suggestions for their improvement: what we call a 'co-design' approach." (RED, 2006: 13)

[16] The PhD research programme consists of two main phases of data collection. The first phase explored the project experience of key project stakeholders. The second phase, currently in progress, explores the project story as told by the design teams involved in each of the projects.

[17] See Design Council Double Diamond model at http://www.designcouncil.org.uk/en/About-Design/managingdesign/The-Study-of-the-Design-Process/

[18] See DIEC model at http://diec.onene2dev.raki.enigmainteractive.net/page/marketing_design_fusion_model.cfm

[19] SPARC stands for See, Plan, Act, Refine, Communicate. For more detail see Mayo Clinic SPARC website at http://mayoresearch.mayo.edu/mayo/research/sparc/how.cfm

[20] The author's previous practice utilised the CMU user-centred design methodology

A review of these models show they are broadly similar[21] and many Dott 07 Designers stipulated this in the interviews saying that "… it feels to be that there are different ways to explain and describe things, but generally they are all much of a muchness for basically the design process." (Telford, 2008)

Models of the design process are valuable in providing a guide to both Designers and project stakeholders for what is to happen during a design process in its broadest sense. Communicating to project stakeholders what they can expect during the course of the project can reduce perceived risk, increase confidence and demonstrate a methodology that has been 'tried and tested' which adds credibility to the work of the Designer or design consultancy[22]. For the design team, a design process can make tendering and pitching for work easier, mobilise and guide the team, assist in project planning and make for more efficient projects where teams can avoid reinventing the wheel. Finally, for both the project stakeholder and the Designer, the benefit of articulating the design process is that it, "… just helps to have everyone on the same page, to have everyone have some general design principles." (Gormley, 2008)

It's not about what it is, it's about how you use it

While there is tremendous value in visualising the design process, it has a somewhat limited benefit when it comes to moving the project forward. The Designer must know how to populate the different phases of process in order to stimulate action to bring quality research into the project, engage and enable project stakeholders to collaborate and participate, and produce valuable ideas. As one Designer put it, "… it's very broad, and it's about what goes into them." (Reason, 2008) Models and frameworks of the design process aren't able to effectively represent how they are to be used, because in use, the design process is not as clear-cut as the visualisations make them out to be. There is a high level of intuition, flexibility and ambiguity brought to the design process by the Designer.

Populating the process

A large part of populating the design process is contingent to the people and context of which the design process is situated. The process is therefore not concrete in delivery, but is instead flexible and adaptable, as one Designer comments, "I think [the process of design] is very flexible and I don't think you will be able to hold people to [it]." (Gormley, 2008)

Flexibility in the design process also facilitates higher levels of creativity, allowing the space for this among people (further on in this paper, more detail will be given in terms of how Designers in Dott 07 adapted the design process to ensure that project stakeholders were engaged and actively participating along the way). One Designer of Dott 07 discusses the need to have less structure in a design process for creativity:

[21] Synthesis of the models show that they usually start with the discovery of people's needs and/or experience for inspiration, followed by brainstorming and generating ideas. Prototyping of key ideas then occurs with several iterative stages. Finally, the refined prototype moves the project into implementation and build.

[22] A marketing person once told me they engaged a particular design firm over another because they could show a methodology.

> "I think with a methodology it's a way of structuring things and [with] creativity […] you don't want to reign it in with too much structure. So again, you need a balance of like, ways to encourage or stimulate without actually stifling, you know, the creative process." (Webb Allen, 2008)

In the Urban Farming project, the inspiration for the idea[23] was derived from a research phase with the Middlesbrough community that included methods of observation, interviews and immersion with the people[24] and place. A Designer on the team described the research phase as doing "things as questions arose" (Belk, 2008). The Designers drew from a variety of research methods from disciplines such as marketing, anthropology etc. Some Designers even have an aversion to framing them as 'design methods' saying:

> "…there are just methods out there that people use to research and find out things, and there are methods that people from all sorts of disciplines use and they all massively, massively overlap. So I think, that saying they are design methods is just annoying." (Singleton, 2008)

Designers recognise that each will carry out methods in their own unique way. "One company would do a different kind of Discovery / Insights / Understanding than another. They might do more market research and less ethnography" (Reason, 2008), which illustrates that the way the methods are carried out, are largely dependent on the design team's modus operandi.

There are also different combinations of methods that can happen and that are an important consideration of the Designer of design teams. In the process, the Designer is deciding, "What discipline, or what disciplines to employ. And then what combination" (Lee, 2008). Some design firms, design-led organisations and Designers help catalyse these decisions by keeping a log of their methods in a 'methods bank'. Many practising Designers refer to these methods banks mainly for inspiration[25]. Some example of these include:

- The Netherlands Design Institute, Methods Lab[26];
- ServiceDesign.org, which live|work formally hosted[27];
- Engine's bank of methods[28];
- The Design Council Methods Bank[29]

[23] This included a 3-part narrative of getting locals involved in growing their own food (Grow Zones), developing recipes and cooking (Kitchen Playgrounds) and celebrating the process at an event (the Town Meal).

[24] This included local residents, farmers, allotment owners, café and restaurant owners, communities involved in healthy eating and food growing etc.

[25] In conversations with Designers, many of them mentioned that they visit methods banks for inspiration.

[26] Found at the back of their book, Presence.

[27] See www.servicedesign.org

[28] See www.enginegroup.co.uk

[29] Design Council's Methods Bank includes 2 methods banks. The first is a log of methods, identified from four design project case studies. The second, an open source website that has members contributing practical methods for inspiration and project planning. The latter can be found at: http://www.methodbank.com/cgi-bin/view

But much like the design process models, methods banks can only provide limited value if Designers don't know how to use them with the right people and in the right context.

Using intuition and adapting the design process

The Designers in Dott 07 often used their intuition to guide decisions for design methods in the process[30] (Thackara, 2005: 213). One Designer commented that, the design process is, "an intuitive approach that people just kind of know, or think they know, their stuff at their fingertips" (Singleton, 2008). In some cases, the design process is so intuitive that they "… don't know it off by heart. We have [our methodology] somewhere, all stored. It's very detailed. I'm not sure of the names" (Gormley, 2008). Designers hold a 'design attitude'[31] whereby they do what they need, to get what they want[32]. It is as furniture Designer Bill Stumpf once said, "The sources of invention and new design knowledge are not in the design cookbooks and menus, but out in the vegetable patch" (Alben, 1997: 9). By getting out "in the vegetable patch" (Ibid), Designers connect directly with people and the context, making decisions based on whom and what they are designing for. The project stakeholders of Our New School understood the value of the Designer's having direct contact with the school saying that:

> "… it was good for the Designers to spend some time in the school really, to fact find. I mean, I guess most of them hadn't been in a school since they themselves had been there. Schools are different animals today, so fact finding was important." (Collier, 2008)

The time spent getting to know the school and the students was important in preparing the design team for bringing students into the design process. One Designer from the project spoke about the difference between high school students and adults as participants in the design process. He stated that in any situation, the Designer must, "really hold the attention of the group of people" (Lee, 2008), but outlines where children and adults differ– "in a meeting in a group of adults there is politeness and there is, you know, more responsibility. When they are group of students, when they get bored, they will let you know" (Ibid). The way that the design team sought to overcome this issue was being aware that plans cannot be set in concrete, and being open and adapting to change. The same Designer commented:

> "… you have to be quite nimble with workshops. There is no point in flogging a dead horse. It's certainly something that we wouldn't want to do with teachers, or adults, or schools, or businesses." (Ibid)

The design team equipped themselves with contingency plans for changing the courses of action as the situation evolved:

> "We have a range of things we plan to do, and we have back-ups as well. Because we never really know … what's going to happen, that's the whole point….

[30] One of Thackara's principles for "designing in a complex world" is to move "From blueprint and plan to serve and respond" meaning having the ability "to respond quickly and appropriately when reality changes." (Thackara, 2005: 213)

[31] Boland and Collopy (2004) state that a 'design attitude' approach would "approach problems with a sensibility that swept in the broadest array of influences to shape inspiring and energising designs for products, services, and processes that a re both profitable and humanly satisfying" (Bolond and Collopy, 2004: 3)

[32] A note take from an informal conversation with a Designer

> half way through an activity, you put something else in to mix it up a bit, a wild card or something." (Ibid)

Our New School was not the only project that included students in the design process. The Move Me project included a younger group of students between 7 to 9 years old. The design team here also saw the importance of adapting design methods and process. A Designer on the project stated:

> "… you kind of have to cut the cloth to fit the particular types of people that you are going to be working with… some methods, you will get a good response for the methods, but with other people, you will just get them rolling their eyes to the back of their head and not want to deal with you." (Telford, 2008)

The Dott 07 design teams that involved children demonstrated how open the design process could be to people without design backgrounds. One Designer stated:

> "… to be involved in that process you don't have to be a Designer, you have to be an open-minded individual to share thinking and ideas and Designers help shape your thinking… facilitate your thinking as you go through the process." (Townson, 2008)

In doing so, the design process can unlock valuable contributions to ideas for the project. For example, the Move Me project found lots of value in the ideas generated by the children. "Some of [their ideas] were very realistic, some of them were very imaginative solutions[33]" (Harrison, 2008). By using intuition and adapting the process to suit the people and context, the inclusion of non-Designers is enabled in the design process to add value to ideas through their knowledge and creativity.

Low or no tech design methods, using the "appropriate 'technology"

To enable non-designers to participate in the process, such as school children[34], the Designers in Dott 07 ensured that the design methods were appropriate to the people. All the projects utilised very modest technological interventions because this suited the nature of the people involved. About half the projects set up websites and/or blogs[35] to keep project communities up to date and informed of the project process. The most technological intervention of all projects was the introduction of film-making in Alzheimer 100, which was well-supported with skills training in film and allowed the Alzheimer community to tell and distribute stories of their daily experiences with dementia. On the whole, the Dott 07 projects utilised methods that encouraged the direct experience of people interacting with people, place and artefacts. For example, in Our New School, the design team took students off-site to a performing arts centre where they could identify with the movement of people around a space and contribute fresh ideas for their school:

[33] Harrison (2008) further added, "The children came up with many ideas for transport and to make public transport more desirable, such as "… Bicycles that would fly over the traffic and things like that, and also ideas about the buses and how they could improve some of the facilities on the buses, so people would be more keen to use the buses, you know like televisions and refreshments… spoken information about timetables… nice seating at the bus stop, just making the bus stop more attractive so that people would be prepared to wait for the bus to come."

[34] And at the other end of the spectrum, Alzheimer100 got elderly people with dementia to participate in the project.

[35] Such as Alzheimer 100, OurNewSchool and NewWork projects.

> "… what we got was a much more fertile group of statements and lists of different things that went on. If we had just done it in school, we would have just gotten a list of what lessons they have and what places are there in the school, and not the interesting stuff like the in betweens." (Lee, 2008)

While communities can benefit from using technology in the project process, the Dott 07 design teams utilised "appropriate technology" (Rowe, 2008) ie. Low or no tech methods that suited the communities involved in the projects enabling them to participate.

Engaging and entertaining people throughout the process

Getting people to participate in the design process, requires the Designer to continually inspire action[36] on rather "unsexy" issues[37]. The Dott 07 design teams approached the project in a ways that "… allow[ed] people to identify the problems and become part of the solution" (Gormley, 2008). Both DaSH and Move Me used a method called cultural probes[38]. This method didn't just succeed in bringing great insight into the daily experiences of the communities, but also engaged the project stakeholders in identifying key issues from which they could then generate ideas to overcome. The use of cultural probes were highly engaging and memorable for the project stakeholders[39] in DaSH. Even stimulating them to think about the application of these methods for their own consultation post-project:

> "I would think to myself as being someone who knows how to consult young people, that's part of my job, and hey, I'm good at that. But [the design team] came up with some really interesting ideas… very interesting stuff… called them cultural probes […] I should develop a lot more consultation tools than I've already got!" (Douglas, 2008)

The design teams carefully and thoughtfully assembled the cultural probe packs, and in some cases, parts of the packs didn't directly produced ideas but were crucial in engaging people to participate in the activity. The Designers in Move Me found this to be the case with the cameras inserted into the packs for the children:

> "… we used some interesting things like the cameras for the kids… And it really encouraged them to do it. While the outputs of the photos… didn't lead to any particular [idea], or added to the output of the project… they were still incredibly useful to get the kids engaged and have something to talk around when they were describing their journey." (Telford, 2008)

[36] Ralph Ardill, Founder and CEO of The Brand Experience talk about design leaders needing to inspire and " keep the why alive, all the way through, not just at the front end" of a project.

[37] Deborah Szebeko, Founder and Director of Thinkpublic regularly refers to the issues in health etc as "unsexy"

[38] Cultural probes were first written about by Gaver, B., Dunne, T., Pacenti, E. (1999), and used in the Netherlands Design Institute Presence project. Cultural probes are packs given to people (eg. they could contain cameras, diaries etc) to help stimulate thinking and capture people's experiences in different ways.

[39] The project stakeholders on DaSH and Move Me stated that the cultural probes were one of the most memorable methods used in the projects.

Adding elements of fun and entertainment to the project experience may not always directly contribute to outputs, but are important to catalyse the process.

Making things tangible

Up till now, this paper has largely focused on the design process, but it is also critical to note the importance and value of the tangible aspects of design. The Designer's ability to make things tangible is one of the most valuable skills of the discipline, and in Dott 07 enabled further engagement of the communities. The project stakeholders in Low Carb Lane stated the benefit of visuals in providing a narrative to engage people in the issue:

> "[The Designer] was just taking photos of like the most bizarre things. And I was taking photos of like the boiler, and stuff, really technical stuff. [The Designer] was taking photos of the sign for Castle Terrace and things, and I actually saw a presentation that he gave… and I had kind of pieced together why he'd done it because he was kind of keen that the audience didn't just view it as a really technical project, it was engaging the public with the whole environmental and community energy theme." (Fowler, 2008)

Some of the projects also mapped current situations being faced by the communities. For example, in the Alzheimer100 project, the design team mapped the 80+ disparate services available to people with dementia and their carers to show the vast array of support available with very little means of accessing to them. One project stakeholder mentioned this as a memorable aspect of the project reflecting, "[it was] very interesting to see that there were loads of services out there, but how do you access them?" (Dewdney, 2008). Seeing the reality in a direct, visual and memorable way can encourage a sense of dissatisfaction to the current situation, inspiring communities to take action for change. Management writer, Peter Drucker, states that unless non-profit organisations create 'doers' within it, "[the] institution has had no result; it has only had good intentions.' (Drucker, 1990: 39).

Visualisations are used not just used for idea generation but also for prototyping, and prototyping was found to be highly appealing to the project stakeholders. Visualisation allows people to "think to build and build to think"[40] and in the New Work project, the design team got the project stakeholders to sketch out ideas they had. "So rather than writing it… getting people to sketch makes them put more detail into an idea" which allows them to "… work through the idea more in their head" (Sim, 2008). The design team found that, "once people [got] hold of an idea… they really kick[ed] off" (Ibid). A project stakeholder of New Work reflected, "I think we came up with something like 20 different ideas. It was amazing…. some of the crap ideas, actually merged to become one good idea." (Cooney, 2008)

Visualisations were an important part of all Dott 07 projects, and were also able to raise the level of engagement of the communities as one Designer observed, "… once people started to see things happen, they got more engaged" (Telford, 2008). Further adding that Designers:

> "Don't just think about the issues and write a report and leave it at that, but actually to do something about it. And that's where I think design has the ability to make things look or feel quite real and just can be used and work immediately." (Ibid)

[40] IDEO Partner, Mat Hunter, in a presentation at the Design Council on design leadership.

One Designer sums up that there are:

> "… two key things [about] design methods. There is one thing, which is kind of action-orientated, qualitative, user-centred research thing, which gives a certain kind of stimulus for either new ideas or improvements.... The second thing is the working up of the tangibles of a thing." (Reason, 2008)

One of the most under-recognised skills of Designers is their ability visualise insights and current situations to move communities forward to take action. Then, using craft skills for visualisation, Designers bring tangibility to ideas to catalyse the process even further[41].

The need for confidence in the process

The flexibility and reflexivity in using the design process brings a high level of ambiguity to projects upfront. Designers must be comfortable with ambiguity of not knowing exactly what might come next, and having confidence in their ability and the process, that their skills of adapting will lead to quality results.

> "We have to be confident about the process. You say [to the project stakeholder], 'Well look, at the end of this, you know at the end of this we would have produced the right thing and that we would have also be able to mobilise a lot of people like you." (Gormley, 2008)

But the project stakeholders often found this ambiguity challenging to deal with. One mentioned, "I like to know the end game almost before I start, and I couldn't work that way on this one and I had to work it through to see the completeness of the vision." (Collier, 2008)

Many of the design teams in Dott 07 involved the project stakeholders along the way, and for most, this helped them feel comfortable with the ambiguity and continual adaptation of the design process, as one project stakeholder said:

> "I realised that actually they would be with us each step of the way, they would support [us] at each step. There would be a lot of contact. They just weren't going to be voices in London, they were actually going to be here, hands-on, doing interviews, showing us how to use design." (Williams, 2008)

Doing it with, not for and embedded legacies

In involving the project stakeholders in the design process, the Designers shift the use of design methodology from doing it *for* people, to doing it *with* them[42] (Hofmeester and de Charon de Saint Germain, 1999: 10-21 and Thackara, 2005: 220-5). By engaging the project stakeholder

[41] Thackara (2007a) comments that design-led interventions are for the delivery of "designed outcome[s] and not just a concept. That there is a kind of sense that the project is informed or shaped by the users of the thing, and thirdly that there is a design quality to the whole package, that gives it life, and a quality that is not a kind of PowerPoint presentation from a management consulting company or a glossy booklet to be read by just managers and clients."

[42] The author's pervious practice recognised the potential of doing it with, with project stakeholders.

throughout the entire process, they are given the opportunity to "identify the problem and become part of the solution" (Gormely, 2008), enabling a greater sense of ownership, establishing the project stakeholders as "guardians" (Belk, 2008) to the principles and ideas, and embedding legacies.

Embedded legacies mean the thinking, ideas and practices that have remained and are currently being acted upon by the individuals who participated on the projects. For example in the DaSH project, the project stakeholders have continued to develop ideas for a GUM clinic using the same principles of the design team in taking a macro and microscope of view the service design[43]. The project stakeholders have held onto seeing their service on a high level, whereby "progressing through a [sexual health] service…. you never go back, to the same waiting room, for instance" and on a detailed level where they now "think about where we put the magazines" in the waiting room because "If you put a magazine in a table in the middle of the floor… everybody has to go up and get it and you hate that because everybody looks at you." (Douglas, 2008)

Embedded legacies are not highly visible and usually manifest themselves in tangential ways for example post-Alzheimer100, a branch of the Alzheimer's Society has been prototyping a couples group service and have been taking inspiration from the methods and approaches used in the project to help develop the new services:

> "… we have just started a new group, a couples group, and we have kind of used a lot of things from the design team… it's helped us to look at the ways that, instead of thinking about the service, let's design the service. Let's work and go out and find out, and use different methods as well." (Williams, 2008)

The other key outcome for designing *with* people, is that it has brought is an awareness and confidence to people's creativity. Harvard Business Review once reported that when we get to the office, creativity gets at left at the door, but the Dott 07 projects sought to engage people in "creative endeavours" (Middlesbrough Council, 2008), and in doing so developed confidence in people bringing their creativity to work. One project stakeholder stated that the Dott 07 project gave her insight into, "skills I probably knew I had, but I had never, kind of, used them. We were always a little bit fearful of maybe taking that step" (Williams, 2008). Creativity is valuable to organisations and communities in the creation of new ideas and is also highly satisfying for individuals. One Alzheimer100 project stakeholder articulated her reaction to seeing their work on display at the Dott Festival as, "Wow! I never ever would have thought I would have ever been involved in producing a piece of work like this" (Ibid). Project stakeholders are now going forward with their ideas for developing and delivering services, but in new and different ways, demonstrating embedded legacies and the impact that involving people in the design process can potentially have.

Creating champions

Many of the Dott 07 projects have had significant impact on the way the projects stakeholders now approach thinking and doing in their work. In some cases, project stakeholders have become "guardians" (Belk, 2008) of principles and ideas. But only time will tell if these project stakeholders become "hosts" (Reason, 2008) for the ideas, actively carrying and sponsoring the ideas in ways where they take on a life of their own. It will be interesting to

[43] In an interview with Designers on DaSH and Move Me, they spoke about their role as taking macro and microscopic views of services, both becognising the big picture and paying attention to the detail.

observe if these project stakeholders evolve into champions for sharing new approaches of thinking and doing, while challenging the status quo in their own organisations and contexts.

Starting a conversation about measuring design

Throughout the data collection, it found that anecdotes and examples were one way to identify the impact of design projects. While this paper does not aim to discuss the measurement of design, the research has started to question what would happen if we shifted our focus from looking at design outcomes, to the impact it has on the people involved. One implication the research has found is that identifying the impact design has had on people needs to happen over time[44]. Interviewing the project stakeholders 6-12 months after the project completion allowed for reflection on how learnings from the projects manifested in other activities that have happened since Dott 07. Learnings weren't exclusive to the project stakeholders either. On the Designer's side, the projects of Dott 07 have, "…just added to our pot of experience and it will manifest itself in other projects in ways that I have not yet considered." (Townson, 2008)

Concluding remarks

The public commission projects of Dott 07 offer a unique opportunity to reflect on the changing nature of design methodology both in and of it self. The conclusions made in this paper can only be indicative (given the point in time of this PhD research programme) but if design is to make contributions to new and different situations, then continuing awareness, understanding and reflection on design methodology is important in catalysing this emergent area of design.

Further research questions and opportunities

The research programme still has a significant amount of time to reflect on research and data collected and to be collected. Further questions that have risen throughout this research programme for reflection and research include:

- Can Designers transform communities of purpose into effective communities of practice?
- Do Designers working in the public sector have the ability to connect people to policy (and in the private sector connect people to strategy)?
- What kinds of new value are Designers bringing, and could potentially bring, to the public sector and public life?
- What kinds of business models are needed to facilitate new uses of design methodology?
- What qualities of design leadership are needed for designing in the public sector?

[44] A wonderful example of how design in public life doesn't stop when just because the Designers job is done is Federation Square in Melbourne Australia. The cultural prescient continues to be widely enjoyed and used by locals and visitors to the city, many years after it's design and construction.

- What is the changing role of the Designer in projects such as these[45]?
- What design skills need to be developed for designing in the public sector?
- What new evidence bases are needed to demonstrate the value of design in the public sector?
- What needs to be down about bridging the language gap between design and the public sector so we can connect better with project stakeholders?
- How do we inspire other Designers, students and professionals, to see the potential for design in this new and different area?

[45] The former RED Unit at the Design Council called attention some philosophical and practical challenges facing Designers working with social issues. These mainly have to deal with evolving from being “traditionalists” to “transformers”. Some of these challenges include: Sharing the creative authorship; “Shaping behaviour rather than form” and bringing transparency to the design process and “exposing the principles and skills of design to enable us to design with people rather than for them” (RED, 2006).

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Social Design:

Exploring the systemic conditions of sustainable change

Suk-Han Tang[1], Louis Klein[2]

Abstract

This paper gives a very broad definition of social design and explore in a narrative way different projects from around the world, presenting the possibilities of what we, as a society could do differently today. On the first chapter, the SocialDesignSite gives its broad definition of social design and framing the approach of the project and the necessity of impact evaluation. Looking at factors for successful change, the second chapter elaborates on awareness as being already a step for change, followed by the necessity of bringing leadership through innovation and facilitating the change process, and at the end presenting an example of sustainable community, ecologically and socially sustainable. This paper identifies the important factors necessary for successful change.

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1. The SocialDesignSite

Elaborating on sustainability and directions for change, it is essential to think about social design and explore the possibilities first. The term social design appears regularly in a wide range of contexts across the globe, though it is put to different uses and given very different meanings. In 2006, the Systemic Excellence Group, Independent Think Tank for Leading Practice based in Berlin, launched a non-for-profit project in order to explore the existing conditions of social design and in which form this could take place.

The social world is created as a result of the dynamics of all our individual actions and the term “social” is commonly referring to boundaries of society where social design failed; we tend to focus on issues found on the borders of the society, and not in its central active part. However, by focusing only on those boundaries, we lose the sight of the very heart of what is working in the society and the possibilities of what could be improved, or be done differently not only in the future, but also at present. This is also referring to active practices.

Sophie Dubuisson-Quellier, a French sociologist describes “political consumerism”[3] as actions that take two different forms: one is the passive form, called “boycott” and the other is the action form, known as “buycott”. In the 50’s Martin Luther King organized in the town of Alabama what will be called “boycott”, the action to refuse to buy or take part in an activity as a way of expressing strongly disapproval, in order to protest against the bus that were practising racial segregation toward the black community. The buycott is the practise that is looking to promote production and consumption of products that has an ethical consideration, such as national products, eco-labels, food without genetically modified organism or products from fair trade. That notion aims to restore in the political debate the involvement of consumers that choose producers and products according to their ethical and political considerations.

As such, and in a broader sense, we want to bring back the term “social” in the heart of society and by bringing back the responsibility of every single individual action to the people, we bring it back to the society.

We cannot not be social.

We cannot not design.

We cannot not change the world.

We refer the term “design” to everything that is man-made. “All we do, almost all the time, is design, for design is basic to all human activity.”[4] Design, in this sense, is any circumstance that is a result of and condition for action. It is there whether we are aware of it or not. It is inescapable. In everything we do, we constantly shape the world we live in and any actions will always have consequences on our social world.

Social design is then a great opportunity and at the same time a great responsibility because it relies on the choices we make every day. It is the perception of a man-made reality that consequently can only be changed by man.

We established research in social design in order to gain a perspective, understand and gain knowledge of models, methods and instruments available in order to evaluate the impact on the social world and explore the possibilities of what we could do differently. Our ambition as a think-tank is to illustrate the inescapability of social design and social responsibility by creating a portal that would enable the possibility of social impact evaluation on everything linked to human activities and in establishing a vivid exchange and learning platform for a broader understanding of social design.

Our approach is not defining social design but rather fostering a discourse on the topic. At

[3] Rymarski, Christophe. ‘Etes-vous plutôt boycott ou « buycott »?’ Hors-série Sciences Humaines, no49, July 2005

[4] Viktor Papanek: Design For the Real World, 1971

the launch of the projects, initiators were invited to take part of the project and being asked if they would contribute in defining social design. The SocialDesignSite, was at its beginning consisted of 20 projects from various disciplines, from individual artist work to big communities. At that time, we clustered social design in different categories (social philosophies, social experiment, systems for living, art based, cultural based, modern artifacts, web based, intriguing) categories that have been transformed over and over again and finally dropped. Coming up with such a broad definition, we realized that the content of the website and the definition(s) of social design is an ongoing process and should be processed in a co-creative mode. One year later, in 2008, we involved members in defining social design, by creating a cloud navigation where each registered member can choose and propose any keyword in defining their project. By then, we realized the two words “awareness” and “community” were used by many and to date, we have more than one hundred social design projects and the number is constantly growing.

Some of the factors identified both from a systemic theory approach and from practical approach based on impact evaluation for successful or so-called sustainable change will be presented in the following chapters.

2. Creating awareness

Sustainable change is about exploring the possibilities for creating a meaningful practice of life and in order to understand change, a reflection on social technique is then necessary. Any kind of change starts with awareness. By observing and realizing where we are today, we are already taking the next steps for change. This is what the SocialDesignSite is aiming at. This will allow us on one hand to gather models, methods, instruments in use and give us the possibilities to evaluate the impact on those instruments and feed the evaluations back to the design. One of the first projects we invited on the website was MASSIVE CHANGE[5], a project started in 2002 and calling for greater public discourse and personal responsibility for designers and their projects.

“For most of us, design is invisible…until it fails.” Bruce Mau

Founded by “Bruce Mau Design” and the “Institute without Boundaries”, Massive Change explores and investigates ideas, people, capacities and ethical dilemmas of design in manufacturing, transportation, urbanism, warfare, health, living, energy, markets, materials, the image and information. Using a wide range of media, Massive Change has taken on the form of a blog, an online forum, a traveling exhibition, a book, a series of public events and a radio program. The project attempts to facilitate collaborative thinking among people who contribute to designing the world and manage interconnectivity of the world, wanting to explore to future of design and calling for greater responsibility for designers.

Massive change is not about the world of design; it's about the design of the world. An ambitious effort begun in 2002 to explore the future of design; attempting to chart the bewildering complexity of our increasingly interconnected and designed world. The project is conceived as "a network that grows exponentially every day," states Bruce Mau, founder of Bruce Mau Design and the chief architect of the Massive Change project.

> “Design has emerged as one of the world's most powerful forces. It has placed us at the beginning of a new, unprecedented period of human possibility, where all economies and ecologies are becoming global, relational, and interconnected. To understand and harness these emerging forces, there is an urgent need to articulate precisely what we are doing to ourselves and to our world. This is the ambition of Massive Change. It is a celebration of our global capacities but also a cautious look at our limitations, encompassing the utopian and dystopian possibilities of this emerging world, in which even nature is no longer outside the reach of our manipulation. Engineered as an

[5] http://www.massivechange.com

> international discursive project, Massive Change: The Future of Global Design, maps the new capacity, power and promise of design"

The future of design is fundamentally collaborative so discussions must go beyond the design field itself to the broadest possible audience. Instead of structuring the Massive Change project around professional design disciplines, like graphic design and industrial design, its creators looked at design from the perspective of the citizen. The events, the book, and the growing online community are short cuts to provocative thinking about the power and promise of design and are intended to encourage people to think about and ultimately, influence design.

On an individual inter-action level, "We are We Are What We Do"[6] is a social movement that proposes and promotes small and easy changes to implement in our everyday life and to bring immediate change to the world we are living in. Initiated in the UK, it defines itself as a social movement (not a charity, not an institution), a movement driven by human momentum and an ability to balance artfully on their neighbor's shoulders. The initiative was set up with a modest social design instinct. We Are What We Do are promoting the idea that small and easy changes in our everyday lives can lead to significant large scale change. Their first book, Change the World for a Fiver, contained fifty simple actions that everybody could do. These actions work in isolation. But they work even better when done together. There are actions to compel us to find out how our money is invested, why we should shop locally, to learn a joke and to write to somebody who inspired us. We Are What We Do explain their perception of social design and the situation in the UK like this:

> "We are We Are What We Do, understand social design to mean the way in which people influence each other. If you imagine that people are like billiard balls on a billiard table, glancing off each other, knocking into one another, being pocketed then we would rather not play; thanks all the same. We would much rather believe that people are capable of influencing each other, interacting with each other, standing on the shoulders of each other to create social change and influence this world that we live in.

Although change starts with awareness, the directions for change are manifold and in order to achieve sustainable change, a group of individuals need to share common values and brought together for designing their common future together.

3. Facilitating change

Social systems tend to do what they are used to do. Individual agents provide variation by providing a large range of actions, by doing things differently. In the mechanism, we select things we will never do again, and retain only things that can be part of and integrated in a system. This applies to any kind of human activity. Change can be seen as an ongoing oscillation between self-recognition and self creation. Recognising where we are today, observing the current status, finding the next step for direction for change. It is also about whether we continuously improve within the existing paradigm or we want to do something differently.

The two following examples illustrate remarkably the process of facilitating change in two different disciplines, one in improving the social and interracial conditions of a community and the other as an illustration of social entrepreneurship in establishing and creating businesses in villages in Indonesia.

Crossroads Charlotte[7] is an initiative that uses imagination and storytelling to involve a community in choosing the path of its future.

[6] http://www.wearewhatwedo.org
[7] http://crossroadscharlotte.org

The project began in 2003 in response to a 2001 Harvard social benchmarking study that ranked the Charlotte, NC community next to last in levels of social and interracial trust out of 40 U.S. communities surveyed. This was particularly alarming for a new south city that has struggled for decades with Black and White issues, and now finds itself growing rapidly more diverse, with an exponential rise in Latino and Asian populations. The survey presented a disconcerting juxtaposition: while Charlotte is heavily engaged in faith-based giving and volunteerism, at the same time, it revealed that the generous residents were distrustful and intolerant of people unlike themselves.

Crossroads Charlotte is a civic initiative that presents four plausible stories about the future of Charlotte, NC built on shifts in driving forces such as demography, education, economy, growth and land use, community resource allocation and civic engagement. The stories are presented in live sessions involving actors, poets, readers and facilitated dialogue in a group setting where the community is asked to hear and respond to these stories.

This project is designed to involve leaders and community organizations in meaningful dialogue and to promote individual and organizational actions that will build social capital and promote access, equity, inclusion and trust. They opened an exhibit at the Charlotte Museum of History that features multi-media versions of the stories and highlights from the four stories on dedicated panels. Visitors were asked to view the stories, talk to others and ask themselves: "What can I do to help steer the community towards a positive future and away from a negative one?"

The Seed Program: "Social Enterprise for Economic Development"[8].

The SEED program is a collaborative program of the Asia Research Centre at the Chair of International Mangement (South East Asia), University of St. Gallen and the School of Business Management at the Bandung Institute of Technology. Students participating in the program came from the University of St. Gallen, the Singapore Management University and the School of Business Management at the Bandung Institute of Technology, and are either undergraduate or graduate students.

This project is an example of facilitating changes in business and this program is particularly remarkable in its approach by involving multicultural communities in finding and developing viable businesses. In December 2007, 20 students coming from Singapore, Switzerland and Indonesia gathered to research market opportunities in a community involving 4.000 people living in different villages in Indonesia. Participants lived with the villagers for three weeks, and worked together in finding and developing businesses, taking in account the local resources, culture and climate. At the end of their stay, students and villagers came out with five areas of businesses they could produce (honey production, dried fruits, yoghurt production, organic vegetables, tourism activity) which they then turned in professional business plans and presented the opportunities to Indonesian investment companies.

During the experience, villagers realized their own potential; actively participating in building their future business and at the same time developed their research and market skills. It is also remarkable to note that the program connected the different villages in working together and not competing against each other. The activities developed were financed and a follow-up program will take place again in 2008.

The success of this project lays on the involvement of all concern parties in taking part of the change, bringing in some experts, observers, students, businesses and villagers together in sharing knowledge, implementing new products by taking in account the local resources and cultural ground.

Facilitating change open up the creative process in designing common future. It is about creating common visions, putting together all concerned individuals, taking in account everyone needs and wishes, individually and as a group for shared directions and processes for change.

[8] Daniela Beck, Ph.D.Candidate University of St.gallen, interview

4. Sustainable development

At last, without aiming for sustainability, any kind of change would have a limited impact. Sustainability was officially defined by the United Nations in 1987:

> "Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."[9]

Applying sustainability to social design, we'd argue that sustainable change is one where all parties involved are aware of what it is, what it can be, sharing responsibility and knowledge, encouraging innovation and participation and developing groups and individuals. It is therefore very much related to creating communities, whether physical or virtual, where all individuals take part in the change process. The following example is the Findhorn Ecovillage[10], providing a tangible demonstration, linking the ecological, social and economic aspects of life and is a synthesis of the best of current thinking on sustainable human settlements. It offers solutions to human and social needs, while at the same time working in partnership with the environment. Thus, the Findhorn Ecovillage endeavours to create a climate and conditions for people to live in greater symbiosis with nature and each other.

Community participation and involvement are integral parts of this human-scale experiment. The ecovillage community has been involved in the erection of buildings, wind turbines and the creation of other physical projects, as well as engaged in the development of community policy. Experiments with alternative monetary systems pay and remuneration, festivals and celebrations, consensus decision-making, conscious governance and leadership, continue to evolve through experimentation and experience of everyday life. A culture of continual learning combined with the intention to help find solutions for a better world, are cornerstones of the community's common ethic developed over four decades of its existence.

The Findhorn Ecovillage is comprised of businesses, non-profit organisations, cooperatives, individuals and families. It includes community-wide, local and international initiatives - all working together as a conscious response to the complex problem of how to transform human settlements so that they are harmlessly integrated into the natural environment. Combining alternative technologies, sympathetic building techniques and organically defined social structures, the Findhorn Ecovillage provides a healthy and sustainable home for its inhabitants within the Scottish landscape and sees itself as a template for living in a modern world.

5.Perspectives

As a portal for social design, situations where several projects compete with each other arise. In order to open up the process of exchange, it is then essential to be as transparent as possible. The evolution of the project will be gathering projects owners to relate, share knowledge and gain experience from each other.

As well as developing partnership, it is important to meet and discuss with social actors, and our participation to and organisation of workshops and conferences is one step toward knowledge sharing.

Such events will help us for continuous improvement and will be made available for everyone as a permanent knowledge and evaluation tool and help future social designers to build up their project or consolidate existing ones.

[9] www.ecovillagefindhorn.org

[10] Brundtland Report, UN-1987

The ambition is to put social design impact evaluation on the agenda of the leading discourses of society, i.e. politics and economics. As all political and economical action is inescapably social, the actors and institutions should be aware of the social impact, creating our social world. Prior evaluation might be recommendable.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Beyond 1000 Suns

The usage of 'design culture' to create a new paradigm for a hybrid heat-and-power solar system

Ezri Tarazi[1]

Abstract

As the population of the world continues to grow and energy demand continues to increase, there is an urgent need for sustainable and renewable energy systems that will satisfy the demand, while reducing the need to utilize more fossil fuel or build additional nuclear power plants.

The role of industrial designers can be crucial for the success of any such solution. By introducing a proper industrial design process to the R&D effort, any project will benefit from the wide range of skills, knowledge, inventiveness and vision of the designer.

The design process of Z10, a new paradigm for a hybrid solar heat and power system, will demonstrate this assumption. It is a 10sqm solar dish system utilizing a new way of concentrating solar power that can provide hybrid power and heat energy by tracking the sun and using a concentration equal in power to almost 1000 suns in mass production ways.

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1. Concentrated Solar Power - Background

As the population of the world continues to grow and energy demand continues to increase, there is an urgent need for a sustainable and renewable energy system that will satisfy the demand without the need to use fossil fuel or nuclear power. Technologies of Concentrating Solar Power (CSP) can be a major contributor to the future need for new, clean and affordable sources of energy. Solar power systems use the rays of the sun – solar radiation – as a high-temperature energy source to produce electricity by means of a thermodynamic cycle.

The need for concentrated solar power has emerged due to the fact that solar radiation reaches the earth's surface with a density (kW/m2) that is sufficient for heating systems but not for an efficient thermodynamic cycle through which electricity can be generated. This means that density has to be increased, and that the incoming solar radiation must be concentrated by using mirrors or lenses.

The first commercial plants to accomplish this were designed by LUZ in Israel, and they have been in operation in California since the mid-1980s, with 354 MW of solar power installed. In the meantime, a variety of technological approaches have been developed for different market sectors. These approaches are currently at different levels of maturity. The main concepts used in CSP technologies are parabolic troughs, solar towers or dish/engine systems, which vary according to the concentration devices, energy conversion methods, storage options and other design variables.

The performance of a Photovoltaic solar cell is measured in terms of its efficiency in turning sunlight into electricity. Only sunlight of certain energy levels can work efficiently to create electricity, and much of it is reflected or absorbed by the material that makes up the cell. Consequently, a typical commercial solar cell has an efficiency of 15% — only about one-sixth of the electricity-generating potential of the sunlight striking the cell. Low efficiency levels mean that larger arrays are needed, which means higher costs. Improving solar cell efficiency levels while holding down the costs per cell is an important goal of the PV industry. The first solar cells, built in the 1950s, had efficiency levels of less than 4%, but it is very hard to break the 20% efficiency limit. Newly developed low-cost Photovoltaic cells with thin film produce between 6% - 8% efficiency.

2. Objective

The objective of the project was to achieve a breakthrough in the field of Photovoltaic (PV) cells: to design an efficient solar concentration system which will combine the production of electrical power with twice as much energy in the form of hot water. This will make it possible to produce an affordable product that would compete with traditional energy production even without government subsidies.

3. Global Team of Experts

One of the most important keys for success today is the ability to establish and manage a global team of experts. In order to solve global problems, there are now the need and the opportunity, more than ever before, to recruit, for each project, the best experts on the issues that are at stake. For this project, we put together a multinational, multi-disciplinary team. The CEO[2] of the project has a large experience in the hi-tech industry including the know-how of Venture Capital systems. The Chief Scientist[3] of the project is a world-renowned scientist from Israel with over 30 years of extensive work in the field of photovoltaic and solar energy. The CTO[4] is from Australia with more than 35 years experience in solar concentrating dish systems, as well as a developer and inventor of numerous systems and patents in this field. Another very important key scientist[5], in the team is from Germany and he bring to the project his expertise in development of solar PV cells in high concentration.

The team have a link to an important institutes, like the: Israel's National Solar Energy Center, located at Ben Gurion University, Jacob Blaustien Institutes for Desert Research at Sde-Boqer, the Solar Research Center in Australian National University, Canberra, Australia, and the Fraunhofer Institute for Solar Energy (ISE) which is the largest solar energy research institute in Europe today.

The team also includes other key members from Israel, USA, France, Italy and Germany. Although they are not mentioned here, they all play an important role in the development of the concept, either from a technological point of view, manufacturability, site installations, or with regard to the business development side of the project.

4. The Benefits of 'Design Culture' in a Technological Start-Up Project

The participation of a chief design officer (CDO) and a design studio team in the process of developing a product has a positive effect on any company. When it comes to a technological start-up project, the benefits can be crucial. The design culture is different from the 'engineering' or 'scientific' culture. The synergy between these cultures can create many benefits and enhance to the start-up project's chances of success. Some of the basic principles of the 'Design Culture' are:

- **Vision & imagination:** the ability to quickly and tangibly translate technological ideas into a product concept, scenarios or services, or in other words - the ability to convert this vision into a 'design story' and create a persuasive picture that would convince the partners and investors.

- **Visualization:** the ability to create desirable images that would describe, in an emotional and aesthetic way, the 'future' that the project promises. The ability to visualize the end-product in its natural environment, or as a replacement for an existing product.

- **Human-centered thinking:** the ability to create 'step-by-step scenarios' that would enable the developer to render the human perspective using the product or service in reality. The ability to intuitively guess what the individual would like to

[2] Roy Segev, founder and CEO, former founder and partner at a venture capital firm 'SADOT'.
[3] Professor David Faiman is a director of Israel's National Solar Energy Center, located at Ben Gurion University, Jacob Blaustien Institutes for Desert Research at Sde-Boqer.
[4] Engineer Bob Whelan, former CTO at the Australian National University, Canberra, Australia.
[5] Dr. Andreas Bett, the head of the solar cells III-V group in the Fraunhofer Institute for Solar Energy (ISE), Freiburg, Germany.

have or use or how the individual would like to behave with or around the product. The ability to imagine a 'frustration-free' user-interface and smooth shifts between modes of operation.

- **Wide range of know-how:** the ability to share the diverse technological and marketing information and experience gained from working with various clients. The ability to combine ideas and methods from different and sometimes contradicting fields and disciplines.

- **3D expertise:** the ability to apply the skills of 3D computer solid modeling and graphics to the engineering process. In the context of the solar power project, for example, the optical properties of light and reflections were created by the add-on software used in addition to the solid modeling software that was used originally.

- **Creativity leadership:** the ability to lead creative sessions using various methods, like brainstorming, sketch-storming and think-tank sessions.

- **Culture analysis:** the ability to investigate and analyze social trends and behavior patterns and anticipate reactions.

- **Branding from day one:** the introduction of a design branding and company identity at a very early stage enables the start-up project to establish a strong position vis-à-vis new clients and investors.

5. The "Fostering Goods" Design Process

In this project, it was important for the team to refer to the project as a mass-production system, and not as a scientific 'one-of a kind' prototype. The design process, "Fostering Goods" was used to lead the project through its various phases. This methodology was created by Tarazi Studio, and is used by us with other companies with which the studio works. The process is based on seven phases. Each of the phases is related to a natural process of growing organic plants. This terminology is aimed at focusing the mind to the way nature works.

It is important to mention that the term "Strategy" that we use so often in the design process came to the business world from the realm of military terminology. Strategy is a term that describes "the art of war". Evidently, this metaphor needs to be replaced for the future of the business way of thinking that wants to focus on a renewable and sustainable future. The global economic world should not be regarded as a war zone, but rather as a garden, whose fertility and well-being we need to keep and sustain for our own well-being and sustainability.

The seven phases of "Fostering Goods" reflect this change of metaphor by using the stages of growing fruits. The names of the phases are as follows:

- **Phase 1 | PLOWING** | The preparation of the design brief, setting the project scope, objectives and goals, technological context and research objectives, budget and resources, marketing and purchasing considerations.

- **Phase 2 | SOWING** | Various types of research activities: technology study, materials and process analysis, user observations and interviews, global trends study, benchmark parallel developments, establishment of fundamental territory.

- **Phase 3 | GERMINATING** | Ideation processes of "mind-storming", "sketch-storming" and other creative processes that end up producing a substantial bank of ideas.

- **Phase 4 | BUDDING** | Selection of ideas. Developing several design concepts and creating a visual and emotional vision of the product or product line.

- **Phase 5 | FLOWERING** | Detailed design for each of the design concepts, preliminary engineering and production considerations.

- **Phase 6 | RIPENING** | Full design specifications for manufacturing described in a 3D file and/or by a prototype.

- **Phase 7 | HARVESTING** | Transforming the design into a product and introducing it to the marketplace.

The seven phases of the design process enable the team to change “frequency” according to need. Each phase has a unique taste as well as the freedom to think and to dream. There are other 2 important phases, which comes after HARVESTING, not yet implemented in this case study project, and they are aimed at transforming the process from a linear line to a helix cycle:

- **Phase 8 | COMPOSTING |** Auditing and analyzing the design effect and the true value of it through the various aspects of usability, desirability, reliability, satisfaction and ecological footprint.

- **Phase 9 | FERTILIZING |** New “High View” Introduction Design Brief, and collection of ideas for the next generation of product, system or service.

6. The Design Development of Z10

The development of Z10 was based on a high concentration 400 sq.m parabolic dish that was developed by the Ben-Gurion National Solar Energy Center in Sde-Boqer. Z10 is a much smaller collector, based on a 10sq.m solar dish system utilizing a new way of concentrating solar power that can provide hybrid power and heat energy by tracking the sun. This ability to provide distributed power for domestic demand establishes the technology of concentrating solar power as one of the most promising viable-energy option for the future.

Z10 constitutes a new paradigm in the solar energy field because it uses a hybrid system, capable of concentrating the sun almost 1000 times to generate combined power (2kW) and heat (5kW). In addition, Z10 transforms the industry from one uses flat PV panels to one that utilizes a dish apparatus which, by using simple mirrors, can concentrate the sun 1000 times into small but very efficient PV cells that can convert the sunlight into electricity at efficiency levels up to 30% and generating hot water at 45%% efficiency, which altogether generates energy at 70-80% total efficiency.

By introducing a systematic industrial design process into the R&D effort, the project has achieved a dramatic reduction in costs through the introduction of very large parts using the technology of injection molding. It has also achieved a breakthrough in optical efficiency by achieving almost 5% of flux distribution through the use of over 1000 small flat faceted mirrors, employing CAD systems in a new way.

The new design process intends to deploy the product on the tops of buildings located near houses, in order to achieve proximity to the energy user and to avoid any further damage to the open environment.

Producing electrical power from the sun is still more expensive then coal or gas generators, even when oil prices have more than doubled over the last 2 years. The main reason is that with the current paradigm of flat PV and thin-film PV, the calculation of the price of polysilicon with the low efficiency (~10%) of these panels is not economical. Z10,

with possibly other projects developed in the field of Concentrated Solar Power, may change the formula. The introduction of a ‘design culture’ into the R&D process enabled the project to be directed into manufacturability, and then made it more feasible with a better chance of replacing conventional fossil fuel or atomic power plants.

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Fig. 1: Z10(0) The first working prototype.

Fig. 2: Z10(4) design of four dishes on one pole mount

Fig. 3: Z10(4) for industrial installation in a pharmaceutical plant.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Metadesign tools

Designing the seeds for shared processes of change

Mathilda Tham[1] and Hannah Jones[2]

Abstract

This paper introduces design tools and approaches developed to invite and support higher levels of synergy in collaborative practice. The tools that are introduced through three individual cases have been used to prompt a proactive and imaginative engagement with the sustainability imperative.

These individual cases challenge the very boundaries of design. The idea of 'metadesign' is adopted to advocate design that operates at systemic levels, that invites interdisciplinary collaborations and that seeds or sets up the conditions for emergent processes of change.

The cases represent the fashion industry at mass-market level in Sweden and the UK, the design, production and export of home furnishings in Indonesia, and an (AHRC) funded interdisciplinary design project in the UK entitled 'Benchmarking Synergy levels within Metadesign'.

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1. Introduction

The ultimate context of this paper is the sustainability imperative, and the potentially significant power to yield positive change that design and designers have. (See e.g. Keoleian and Menerey 1994; Thackara 2005)

Although it is gratifying that the sustainability discourse has finally reached the public domain and corporate agendas, the journey towards transcending our current collective conditioning to short-termism, immediate revenues, and a narrow context of decision-making, still lies ahead. The scope of the challenge facing humanity demands imaginative and systemic action and a creative and auspicious organisation of human potentials and natural resources. It necessitates change that not only engages with the substitution of materials and processes, but that addresses the speed and scale of a producer and consumer culture.

The sustainability imperative thus invites the designer into more strategic and systemic territories, and into a more complex set of collaborations; working with other disciplines, with users, and with representatives of wider human and environmental concerns, than what 'design as usual' implies. It suggests the need for a design that invites its participants to operate with fluidity at a wide range of cognitive levels, and to cross-fertilise ideas of different levels of complexity.

Meta-design, the design of design, offers a framework to make such a leap in mindsets and in practice. It can be described as 'a shared design endeavour aimed at sustaining emergence, evolution and adaptation', and 'open-ended and infinite interactivity capable of accommodating always-new variables'. (Giaccardi 2005)

By synergy we mean a condition where the whole is larger than the sum of its parts, where new qualities emerge that were not available from initial components before their *coming together.* The notion of synergy is therefore closely linked to emergence. This paper introduces design tools and theories that have been developed to invite and support higher levels of synergy in collaborative practice.

The tools share four aims:

- To bridge the gap between professional and personal value systems, for a more holistic and embodied engagement with the sustainability imperative;
- To set up conditions for shared learning experiences on several cognitive levels;
- To offer a framework for opportunity focused and imaginative explorations of sustainability;
- To invite engagement with more strategic and systemic designer roles.

The tools that we propose have been developed and piloted through several cases, three of which will be presented in this paper. The first case is situated in the fashion industry's mass-market segment and describes how a rich epistemological framework spurred an extended notion of design. (Tham 2008) The second case, a workshop with designers and manufacturers in Indonesia, shows how the bringing out of tacit knowledge and unspoken values can foster a new sense of community. (Tham and Jones 2008) Finally, the third case, an interdisciplinary workshop, at Pines Calyx in Kent, explores the use of story-telling within a broader framework of tools designed to guide participants through a process of team 'potential realisation' (Fairclough 2005).
('Benchmarking Synergy Levels within Metadesign' project 2007-2009 AHRC funded project at Goldsmiths, University of London.)

Lucky People Forecast, April – June, 2006

Context

Fashion, intrinsically thriving on change – and therefore, according to current modes of doing design, dependent upon a large material throughput. Fashion epitomises wider unsustainable tendencies in society such as the satisfying of needs through surrogates, and a disassociation from the real sites and effects of production, the human and environmental conditions of making everyday artefacts. The fragmented perspective of the fashion system is carried through into the fashion company's structure. Work is highly specialised, which means that designers and buyers rarely work directly with environmental officers and sustainability not appreciated as a shared concern.

Yet, the fashion system also manifests qualities that appear compatible with a paradigm of sustainability, such as an acute in-tuneness with time and space, the sense of empowerment that can come from personal expression and a sense of belonging. At best, fashion celebrates a creativity that operates on rich tacit, visual and experiential levels.

This first case formed part of a PhD thesis, *Lucky People Forecast – a systemic futures perspective on fashion and sustainability.* (Tham 2008) The aim of the study introduced here was to harness positive qualities of the fashion system for more sustainable ends. More specifically the study sought to extend the vision of fashion, beyond product level, and beyond the immediate future. To this end, eight creative workshops with mixed fashion industry stakeholders in Sweden and the UK were set up featuring a range of activities introducing the proposition 'What if fashion and sustainability were compatible or even synergistic?"

The framework for the tools and approaches used in the workshops was threefold:

a) methods and processes that further sustainability literacy – e.g. on a practical level the lifecycle concept; and on an epistemological level the holistic engagement with learning that Action Oriented Research proposes. (See e.g. Heron and Reason 2001);
b) methods and processes in design (e.g. drawing, making, visual and emotive language) and in design research (e.g. the cultural probes approach, Gaver 2001);
c) methods and processes in Futures Studies, such as futures stories and scenario work (see e.g. Slaughter 2001), and a discourse celebrating multiple perspectives on futures (see e.g. Sardar 1999).

Process

Each of the workshops constituted a three-hour session, which took the participants from an initial mapping of fashion and sustainability respectively and together to a scenario task that generated visions for fashion in the context of sustainability in the year 2026.

For the purposes of this paper two of the tools that were developed for and explored in the study are introduced. The first was designed to facilitate group cohesion, and to situate sustainability in the individuals' personal ranges of experiences and skills. The second tool was employed as an evaluative framework of the change that the workshops spurred.

Exemplar tools

- The cultural prop tool
- The four-dimensional attitudinal change framework

The cultural prop tool was inspired by the cultural probes approach, some important properties of which are that of transcending the "understood social roles of researchers and researched…" and eliciting both informative and inspirational material. (Gaver 2001) The new tool uses everyday objects to spur personal narratives on a particular theme. The embryo of this approach was first developed in the Stored Wisdom project. (Sadowska and Tham 2005) The term *Cultural Prop* was coined in the 'Benchmarking Synergy Levels within Metadesign' project, 2007-2009.

In this specific case, the participants were asked to bring into the workshop two objects, representing their personal experience of fashion and sustainability respectively. At the beginning of the session each individual drew the objects of choice and made a list of associated keywords. In a show-and-tell session, drawings and keywords were shared in the group, and all keywords entered on post-it notes that were placed on a big piece of paper. Together the group organised the keywords into themes or 'islands', which were given descriptive names. The result was two maps, or snapshots, of the group's understanding of fashion and sustainability. These documents visualised, embodied and qualified the individuals coming together and their emergent new identity as a group. The maps proved valuable reference points as the group progressed to futures scenarios of fashion in the context of sustainability.

Evidence from the study suggests that the tool can operate on several levels:-

- It can provide a diagnostic framework to quickly get a sense of a group's interests and knowledge;
- It can serve a non-intrusive 'ice-breaker' that quickly draws out the distinctive nature, richness and diversity of a group;
- It can help to situate abstract concepts in an individual and group's personal experience and to integrate new information within an existing body of knowledge;
- It can offer a bridge between personal and professional value systems and identities, and facilitate the finding of common ground between people of diverse professional roles and experiences;
- The situated story-telling approach can facilitate the verbalization of tacit knowledge and foster a shared language across disciplines, professional roles and cultures.

The second tool, the four-dimensional attitudinal change framework is an evaluative tool developed in order to qualify the changes provoked by the intervention that the workshops constituted. By representing a sprawling rather than linear model of change, the tool addresses at least a degree of the complexity that sustainability entails.

The four dimensions of the framework are:-

- Brand/perception - The subjective experience of the compatibility of fashion and sustainability, on a continuum from dichotomy to opportunity.

- Knowledge and awareness - The level of knowledge and awareness of sustainability in the fashion industry context, on a continuum from single issue focus to lifecycle perspective.

- Relationships - The location of personal and professional self in the realm of sustainability, and engagement with the intricate relationships that sustainability implies, on a continuum from partial to holistic understanding.

- Action and activism - The perceived power, and manifested inclination to act and affect change, on a continuum from passive reliance on other stakeholders to personal action and activism.

The four dimensions were translated into axes on a visual map. When an individual or group's statements (in this case data generated through semi-structured interviews) as regards engagement with sustainability are indicated on the map, it is possible to elicit a shape of the particular attitudinal profile. The resulting shape is a blueprint of what we can draw out of this individual or group's metaphorical walk around the particular territory. The shapes can be overlaid with other shapes and comparisons made.

In the figure below the data from all individuals, across the eight workshops, has been collated and formatted into profiles representing the engagement with sustainability before and after the intervention of the workshop. (See Figure. 1) While the profile has expanded in all dimensions, this is particularly pronounced in the dimension that represents *agency*. The least change is evidenced in the factual dimension. While an extensive account of the study results is outside the scope of this paper, a comparison of the profiles shows that the intervention fostered a more rounded, as opposed to deeper engagement with sustainability. The comparison between all participants' before and after profiles also showed that an increased experience of *agency* – however small – was the singular most important factor in achieving a high general change score. Such insights can inform pedagogical approaches in the implementation of more sustainable strategies with students or organisations.

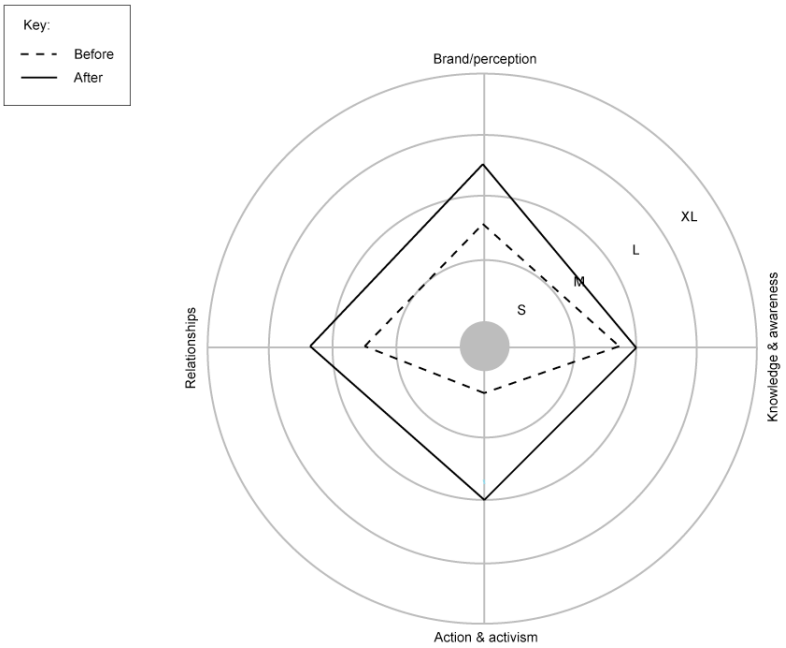

Figure 1. Distribution of responses across the evaluative framework

Seeds of Change

Fashion and sustainability are often perceived as anathema, as while the former popularly implies speed, egocentricity, and wastefulness, the latter implies a slower pace, resource-efficiency and even altruism. In the case introduced above, from the PhD thesis *Lucky People Forecast*, the researcher sought to set up conditions for a more nuanced fashion and sustainability discourse, focusing on opportunities instead of dichotomies. The series of creative workshops with mixed stakeholders groups from the fashion industry served a forum for the proposition “what if fashion and sustainability were compatible or even synergistic?”

The results of the study showed that participants had indeed been able to transcend stereotypes of both fashion and sustainability, and the perception of designer role as mainly operational, and product focused. The approaches also fostered a sense of community in an otherwise highly competitive and secretive arena, and brought a shared sense of purpose and agency to the participants. The study also illustrated that research can constitute activism, as the message of the study spread far beyond the remits of the workshops.

2. Sustainable Indonesia

Context

‘Given that most of the poor are heavily dependent on eco-systems for maintaining sustainable livelihoods, strengthened environmental management is imperative for poverty reduction.’ (UN Development Programme, Country Programme for Indonesia, 2006-2010)

The sustainable imperative in Indonesia has particular poignancy, as anticipated changes in legislation will jeopardise restrictions on natural resources, thus challenging the unique basis and competitive advantage of Indonesian crafts production. Tackling problems at the level of a whole country is not usually the role of designers but for sustainability to work in countries that are rapidly developing, then designers need to be brought in to bring about a step change in negative trends that threaten the country’s self-sufficiency.

During a three-day workshop with designers and manufacturers in Yogyakarta, Indonesia, the opportunities for more sustainable practices were explored, building upon the participants’ own experiences and understanding of both the challenges they faced and their potential solutions.

The workshop was co-funded by the British Council and co-funded and organised by Senada, a non-governmental organisation run by US AID and hosted by Warwick Purser, a creative entrepreneur and founder of Out of Asia, Indonesia's largest exporter of handcrafted goods. The workshop brought together Indonesian manufactures, academics; local handcrafts people, designers, politicians and exporters, all connected to the home furnishings industry. The workshop was, written and facilitated by Mathilda Tham, Hannah Jones from the Department of Design, Goldsmiths, University of London.

This was the first time to bring together different stakeholders in the home furnishings industry into the same room, working together, discussing their work and how sustainability could improve the marketability of their products and motivate the Indonesian design community.

Process

The purpose of this intensive three-day workshop was to present a general background to sustainability and introduce examples of best practice from the design culture in the UK and Europe. The workshops began by grouping the participants in teams and getting each team to produce a shared definition of both sustainability and design. This exercise helped to create a common ground and participants began to realise that they had shared concerns and aspirations for their work. The participants also took part in future scenario mapping in teams and individually interrogated their individual practice with a 'life cycle' based evaluation, helping them to rework more sustainable solutions. Although the participants already had some knowledge of sustainability, the process experienced at the workshop enabled them to actively apply sustainable principles to they own work, whilst generating a collective understanding of what qualities and resources where available for sustainable design and what qualities and resources were need to create more sustainable solutions.

Exemplar Tool

- Parameters for Sustainability Potential Tool

This tool has been chosen from the selection of tools and approaches employed in the workshops to illustrate the awareness of sustainability generated at the level of the whole group. The design thinker John Thackara believes 'We need to design macroscopes, as well as microscopes, to help us to understand where things come from and why'. (Thackara c2005, 6) The Parameters for sustainability potential is a 'macroscopic tool' aimed to harness a collective awareness and evoke a sense of ownership of a culture of sustainability for this community context.

The 'resistance to' and 'support for' sustainability, as pinpointed by the tool are as follows:-

Resistance	**Support**
Communications/ marketing	New market demand
Resource management - materials	Trend (in the media)
Resource management – human	Buyers and users understanding
Cost of eco-production	Education and training
Price of goods	Indigenous knowledge
Access and supply of eco-processes (e.g. finishes for products)	More value and more profit
Lack of education	Natural materials and resources
Lack of political will	The fear of nature degradation
Constraint of economy	Creativity
Individual will	Technology
	Individual will
	Spirituality

To elicit a set of qualities and resources vital for this community's sustainable design practice, the group was first asked to shout out key examples of resistance to sustainability that they experienced in their context and then key examples of support. These keywords were listed on a large piece of paper at the front of the room. Next, the facilitators asked the group to prioritise the key indicators that had been identified. This was done by drawing a line underneath each word and asking the group to bang their

pencils against their tables until they felt like stopping. The longest lines were the highest priorities on the list. This was a highly spirited exercise! The participants shared an agreement for a strong need for management of natural resources and their design community and more education in sustainable practices. Most positively the group celebrated their creative and spiritual interpretation of sustainability and an indigenous knowledge of working with materials that needs to be re-valued and better communicated to their markets.

Seeds of Change

Here sustainability came to serve as a strange attractor drawing together a greater empathy between stakeholders to create a new sense of community. Not only did the participants emerge from the workshop with stronger and more focused visions of the direction of their future practice, but also a new sense of pride and a clearer way of communicating those practices that were already environmentally and ethically sound.

The participants commented after the workshop that this was the first time that people were working together as a community without feeling like they were looking over each other's shoulders. An aspect of the handcraft industry approach is copying popular trends in the west to successfully export designs and so there is a lot of secrecy to secure a competitive edge. The notion of a creative community that emerged moves away from this aspect enabling participants to take ownership over their own trends, taking pride in design.

3. Metadesign Tools at Pines Calyx

The Context

The 'Metadesign Tools at Pines Calyx' case is part of a three-year, government funded (AHRC) research project entitled 'Benchmarking Synergy levels within Metadesign', run from the Department of Design at Goldsmiths, University of London. Over the course of the project we have developed over eighty tools for nurturing, fostering, and harnessing synergy in collaborative practice. The purpose of this two-day workshop was to provide a test bed to evaluate some of our current tools and approaches.

We have defined Metadesign as a comprehensive, inclusive, non-hierarchical, or 'holarchic' (Koestler c1964) design process that also designs itself. This approach transcends the limitations of existing design specialisms by working at a systemic level. This means thinking more deeply about designing for every day life than would be possible in a commercial context. Metadesign works towards attuning political, ecological, economical, socio-cultural, sensual and emotional patterns of living, to create less fragmented and more sustainable cities, services, organisations, etc. This is a highly complex and ambitious task.

Our research aims to go beyond current notions of 'sustainability' by aiming to achieve the more positive idea of a 'synergy-of-synergies'. (Buckminster Fuller 1975) This requires that designers find new ways to work together more proactively to create more affirmative design solutions. The design theorist John Chris Jones, identified at an early stage that the design field has 'become less concerned with the product itself' and 'more concerned with the changes that manufacturers, distributors, users, and society as a whole, are expected to make in order to adapt to, and benefit from, the new design.' (Jones 1970, 6) More recently, John Chris Jones has developed this thinking into the notion of a 'creative democracy' where design becomes a bottom up, co-authored and

participative process. (http://www.softopia.demon.co.uk/2.2/creative_democracy.html) This understanding of the evolution of design also shares its collaborative qualities with the emerging culture of metadesign and is at the heart of the research conducted at the metadesign tools workshop.

The workshop was staged at Pines Calyx, in Kent, the UK's most sustainable conference and events venue. The participants were given 'currency and exchange' as a loose theme to catalyse their design activities. Pines Calyx provided an inspirational local context and reference point for the design teams.

The Process

Twenty-five participants attended the workshop. We employed nine members of the metadesign research team to assume the role of facilitators, scribes and raconteurs. We invited six special advisors from the fields of anthropology and money, design history and philosophy, creative arts, ecology and business and environmental strategy. Finally, we enlisted the expertise of ten designers, drawn from five different design disciplines and cast them individually for one of two metadesign teams.

The metadesign teams were engaged in parallel workshop sessions over the course of the two days. The workshop sessions utilized seven metadesign tools, one of which was the framework of the workshop itself. There were also workshop sessions held by the special advisors to provide vital information about, for example, currency and ecological models used by business. The workshop tools and methods were intended to integrate different specialist design knowledge at various levels (e.g. speculative, intuitive, discursive, practical, etc.). At the end of the first day, the two design groups started working on creating a metadesign brief or designing seeds for the basis of practical designs, for example, re-thinking the idea of currency in a playful, or radical way, these 'seeds' were developed further on day two and presented at the end of the workshop to the whole group for discussion.

Exemplar Tool

- The four-fold integrative framework (Wood, Nieuwenhuijze, Jones, et al 2008)
- The five-levels of processing storytelling tool (Tham, Lockheart, et al 2008)

To highlight the process of change that took place over the course of the workshop it is helpful to introduce the tool employed to provide an architecture for the workshop and one of the tools deployed from within this framework.

The four-fold integrative framework was developed to deploy the other six metadesign tools at opportune moments in the collaborative process. The framework guides the design participants from a 'me' perspective on their involvement in the team to a 'we' perspective on the whole team's involvement in the process, thus, strengthening the team's inter-personal dynamics. The framework also arranges the tools so that they foster and harness both convergent and divergent design thinking to optimise creative synergies in the team's solution finding activities.

The four-fold integrative framework nurtures four different levels of awareness:-

Phase one	Awareness at the level of the self, the designer (my personal involvement, I present MY self, what I am bringing to the table)
Phase two	Awareness at the relational level, 'being with' (reflection on my personal view, 'sympoesis' or creating with the other)

Phase three	Awareness at the level of the team (Each individual identifies with the team as a whole, a team 'potential realisation' (Fairclough, 2005) occurs)
Phase four	Awareness at the level of the wider context (the team as a whole identifies with its wider context/s, potential realisation becomes transferable)

This tool was developed in collaboration with Dr. Otto van Nieuwenhuijze, an expert in living systems and an external consultant for the metadesign project. Dr. van Nieuwenhuijze calls for designers to develop more 'integrative modes of design thinking', believing that when designers act as representatives of a team they need to become 'transpersonal', embodying the values, dreams and concerns of the other members of the team to communicate with external bodies. Arguably, the four-fold integrative framework for metadesigning encourages a more self-reflexive, empathetic, context dependent, inclusive and highly collaborative process than more conventional fragmented and hierarchical design processes.

The second tool to be presented is the five-levels of processing storytelling tool. This tool was deployed in phase three of the four-fold integrative framework. The tool is aimed at enabling individuals to identify with the functioning team as a whole to encourage synergies to emerge. The team participants were asked to recount their experience of a guided walk around the Pines Calyx grounds.

At each level of storytelling, each of the five participants took their turn to speak, whilst simultaneously drawing on a big piece of paper at the centre of the table. Each of the five levels of processing required a different colour pen or pencil to code a chronological, as well as qualitative trace of the team's discussion.

The five levels of processing storytelling tool operates as follows:-

Level 1. The sensual – for 7 minutes
Prompt: What did you see, what did you smell, what did it feel like, what were the sounds?

Level 2. The factual – for 7 minutes
Prompt: What did you learn, what facts did you find interesting?

Level 3. The systemic – for 7 minutes
Prompt: How did what you learnt connect to the outside world, to other contexts, what are the relations between the talks on the guided walk?

Level 4. The futures – what ifs – for 7 minutes
Prompt: How might we build on these sensations, facts and connections, projecting 10 years ahead or more?

Level 5. The synthesis – for 7 minutes
Prompt: How can we summarise the discussion?
Continue drawing. Everybody has to take part.

People at this phase would hopefully fully identify themselves and the others as members of their team. They would also be able to objectively listen to the others whilst

being a part of the group. As the session progressed the accounts shifted from the personal to the interpersonal and shared, and a map emerged that encompassed both individual observations, and a new identity of the experience that was co-owned by all participants of the group. (See Figure.2) As the workshop subsequently continued in a more task-oriented mode – with the design of seeds for alternative means of exchange – the map formed a complex fabric to refer to.

Figure 2. Visual example from the story-telling activity, team one, 2008

The Seeds of Change

To really create a step change in the way people live we need to radically rethink the way people work together; to encourage more sustainable possibilities in the everyday, will undoubtedly require pushing collaborative practice beyond 'interdisciplinarity' to a new culture of 'metadesigning'. In the near future, designers might even be required to set aside their specialist identities to enter into co-authored processes where their role will be as emergent a solution as the actual process itself.

At Pines Calyx the Metadesign tools tested helped to generate a 'seeding process' (Ascott 1995, cited in Giaccardi 2005), marking out a territory to be explored by each of the design teams. The four-fold integrative framework guided the journey from individual contributions to collective endeavors, enabling the ppotential realisation of the whole group.

One month after the workshop, each of the ten design participants were interviewed for 15 minutes on the telephone by an external interviewer. In relation to the overall process that the teams went through, one participant commented how

'…the process and the people in terms of forming the group and how we worked together, were phenomenal… you go from creative to rational very quickly, I don't think we ever got to fully rational in this case, it would be the willingness to live with uncertainty and to enjoy the journey, rather than thinking just about the destination and I think that was fantastically empowering.'

In the case of this workshop 'metadesign allows a sort of creative and unplanned opportunism' (Wood 2000) to take place within the two design teams. Another of the

workshop's participants when asked about how they experienced moments of synergy replied

'I think the moments when I understood more about what my role was and how I could facilitate the group further.'

This indicates that the roles assumed by the team participants emerged as the team experienced moments of synergy.

4. Conclusions

The Ring of Fire model below (See Figure. 3) constitutes a tentative framework for evaluating auspicious and shared learning conditions. It was developed for the 'Benchmarking Synergy Levels within Meta-Design' project and builds upon the study of synergistic moments and processes in the respective cases and beyond. Here the tools form one axis of several 'resources' that we can – to a degree – control or at least plan. Such resources also include casting – the setting up of a group with appropriate dynamics, and facilitation. The other category of axes represents such qualities that are beyond our control, but that we can seek to foster and nurture by fine-tuning the application of resources. All axes constitute continuums between two states, the middle of which signifies the ultimate condition for synergy to take place – The Ring of Fire.

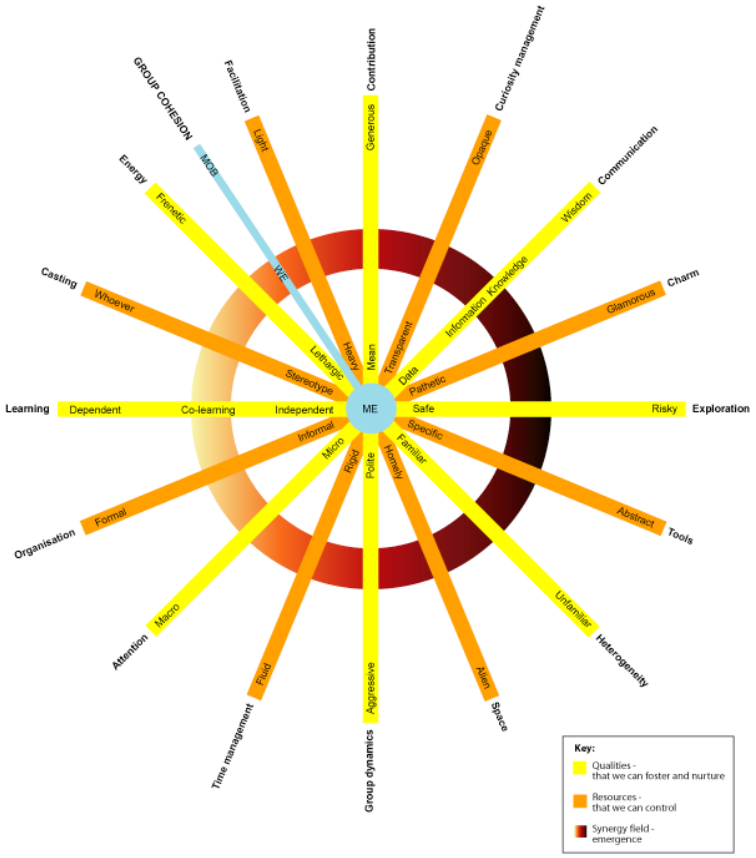

Figure 3. Ring of fire – framework for the evaluation of shared and auspicious learning conditions.

The cases introduced in this paper represent three distinctly different contexts of shared learning. While in the first case the researcher brought into a group of fashion industry stakeholders a distinct agenda, to situate fashion in a sustainability context, in the second case, the workshop in Indonesia, the participants had actively asked for help to address the sustainability imperative. Finally, both the participant base and the aims of the third case were broader, as it served a test bed for design as seeding, or meta-design.

Yet, in all three cases the shared and emergent learning process was in focus, as the expanded notion of design and the designer role, and the auspicious cross-fertilisation of personal and professional experiences and value systems, factual knowing and imagination, and explicit and tacit skills. The tools and the approaches that have been introduced here all seek to foster conditions for such learning, and learning that is contextual. To this end, the tools and approaches that we propose are *partial*; only in situ, with a particular group and a particular focus will they be complete, wherefore the process and the outcomes of the cases have both shared and different identities.

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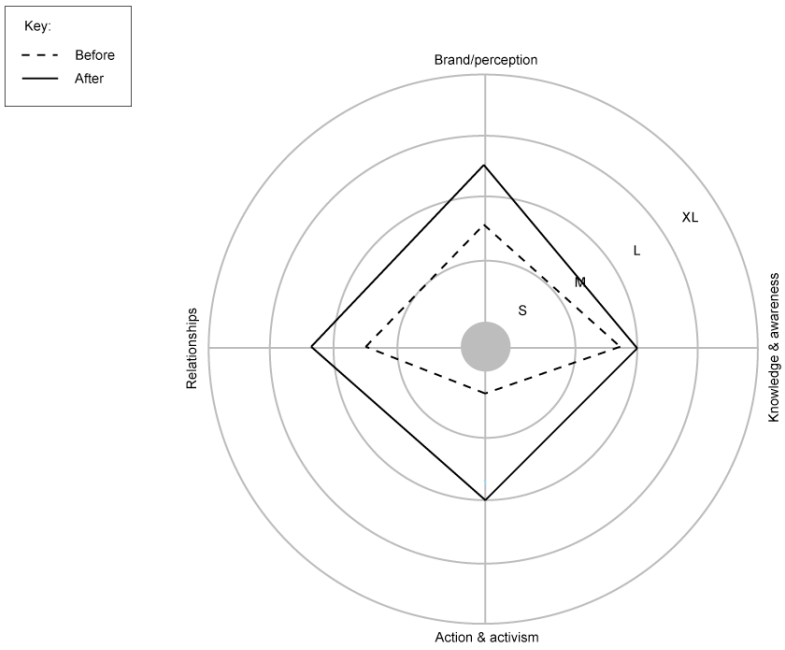

Figure 1. Distribution of responses across the evaluative framework

Figure 2. Visual example from the story-telling activity, team one, 2008

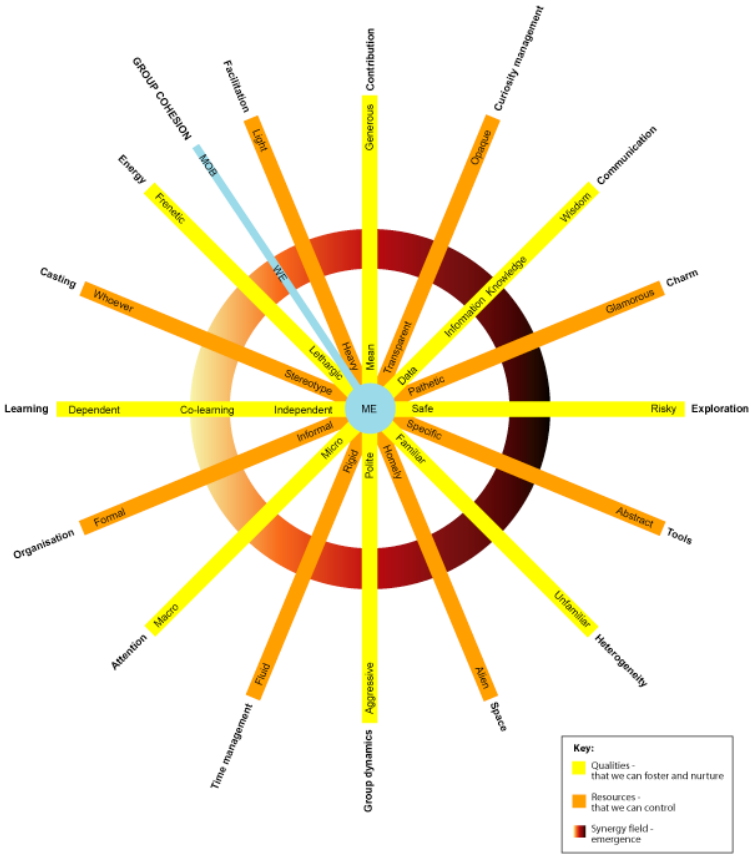

Figure 3 Ring of fire – framework for the evaluation of shared and auspicious learning conditions.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Landscape Ecology as a basis of Landscape and Urban Planning and Design

Siegmar Thomas[1]

Abstract

This paper describes some aspects of design and planning at a regional scale. Actual changes of towns and historic cultural landscapes, also changes of the aesthetic quality of the landscape and urban scenery include: loss of diversity (geo-relief / land form, plant cover, plant and animal species, historic built environment, historic cultural landscapes); loss of naturalness (impoverishment of flora and fauna, impoverishment of the local genetic diversity of plant species, spreading of competitive non-native species); elimination of historic urban ensembles and typical regional settlements, and also older agricultural landscapes; reduction of perception and cognition of the scenery by new filters, new barriers obstructing the view (e.g. new large buildings), increasing disturbance of recreational and protected areas; also by mass tourism.[1]

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1. Introduction

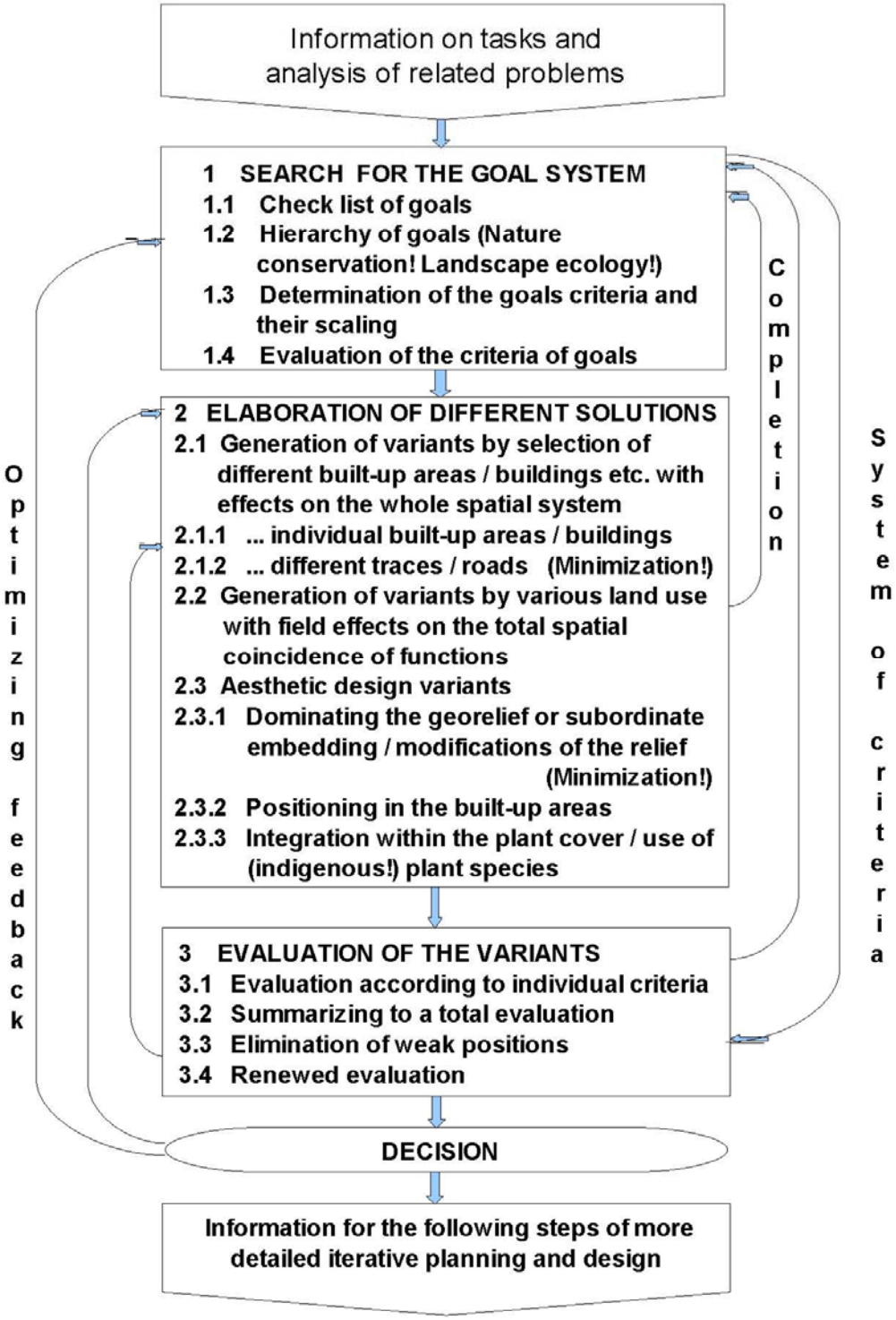
The aims of regional landscape and urban planning / design are to reverse or at least minimize the decrease in landscape and urban diversity. A design at all scales should not be an art work in a pure decorative sense (in extreme cases acting contrary to the landscape ecology principles).
The global climate change will in future worldwide probably more often lead to catastrophic events, e.g. Vb cyclones with heavy rains and floods in Central Europe.
All planning and design must be done under the principles of landscape ecology (towards environmentally friendly and sustainable development). The goal is to reduce negative human impact on the environment. Natural extreme events with worldwide increasing damage potential can become catastrophes for human beings and their goods. They are to be better fore cast to overcome them. All planning and design must take into account preparations to overcome natural extreme events. Learning from nature and use of natural ecological strategies are the best media to avoid misleading developments.

2. Generating and evaluation of different possible solutions for complex landscape and urban planning and design

Landscapes and urban spaces are generally large open systems. For complex problems, e.g. landscape and urban planning and design, we can find almost more different possible solutions. Such variants have to be generated and investigated to find a relative optimum by assessments taking into account all relevant aspects, function, (landscape) ecology (sustainability), economy, form and aesthetic quality. Without investigations about the manifoldness of different possible solutions may be valid: “(Only) one solution is no solution!”

Fig. 1: The following scheme is given after Thomas 1992 (modified).

SCHEME OF LANDSCAPE AND URBAN PLANNING



3. Today's aims of design and planning are to be based on landscape ecology

The recent main goals of landscape and urban planning and design must be based inevitably on landscape ecology (and not primarily on decorative aesthetic design principles by ignoring the essential ecological aims). Some of the main goals of landscape ecology are shortly described in 3.1 to 3.3.

3.1 Protection of areas as large as possible as protected areas (Nature Reserves, National Parks, a.s.o.) and landscape elements within extensively used urban and agricultural lands

The typical spatial land characteristics have to be the basics of landscape planning and architecture, urban planning and design (Kongjian 2007). Areas as large as possible within agricultural and urban land should be preserved in their natural state with only light influence by e.g. routes for ramblers a.s.o. Otherwise they should be re-cultivated to nearly nature-like ecosystems with the indigenous plant cover. The modern aims can not be realized by a type of design that is concentrated only on decorative effects.

3.2 Preventive river flood risk management measures

River valleys are often thousands of years old settlement areas. The river floods as natural extreme events have worldwide increasing damage potential, and become more and more “catastrophes” “if human beings and and their goods are involved severely” (Niedermeyer 2005) by increasing settlement, industry and infrastructure. Global climate change will in future probably more often lead to heavy rainfalls and river floods and mudslides (e.g. Vb weather traces over the Erzgebirge (Ore Mountains, Saxony) and the whole Elbe watershed (Germany, Czech Republic). Different hydro-meteorological sources of river floods in Central Europe exist. Springtime floods are caused by (sudden) snow melting in the mountains and sometimes ice barriers within the rivers. Quite different are other floods, caused by deep air pressure traces Vb (often in springtime and autumn, and in rare cases in summer with humid warm air from the Adria gliding on cold polar air masses coming from North (E.g. deep “Ilse II” 10 – 13-08-2002 from North Italy eastward to the Adria over East Alps to Croatia, Austria, Hungary, Czech Republic, Saxony and Poland = deep trace Vb (classification of Van Bebber 1882; 1891)). This results in high rainfalls some days long over large areas, in the Alps, in the Ore Mountains and other mountains. Then floods and mudslides occur in Germany, Austria, Czech Republic, Poland. The same reasons are valid for the Oder (Poland: Odra) flood in 1997, and especially after heavy rains over the Labe/Elbe watershed – in August 2002 and also the Donau flood during the same time 2002.

Flood protection and nature conservation should be further developed simultaneously – towards natural flood reduction strategies with the following tasks: Natural flooding retention areas are to be redeveloped and enlarged e.g. by new embankments in more far distances to riverbeds. Attention has to be paid to reservoir catchment management in mountainous regions.

It needs re-afforestation especially on slopes in mountainous parts of watersheds; careful agricultural use in hilly watershed areas due to soil protection against surface water flow and erosion; protection of remaining hedgerows, field terraces in mountainous regions, and re-

afforestation there for reducing soil erosion and fast surface water flow in catchment areas with extensive agriculture; protection of remaining riverside forests and re-afforestation; re-naturalization in river landscape. No new built-up areas within flooding zones should be planned or realized. Sealing off in watersheds and catchment areas are to be minimized. Movable flood barriers have to be prepared for temporary use in case of fore casted high floods.

3.3 Protection of landscape (land-form) diversity and biodiversity

Diversity of landscape and urban ecology coincides with land form diversity, in towns modified by the built environment.

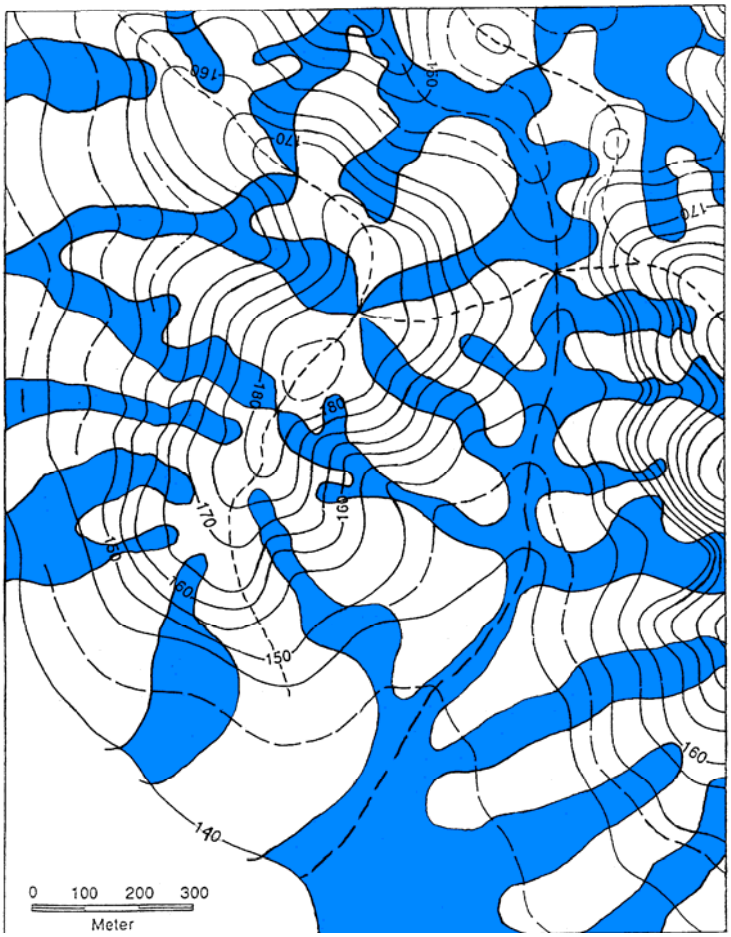
Landform diversity

Land form diversity contributes to the historical development of settlements and to landscape ecology. It also determines the way humans perceive landscape and make aesthetic assessments of the scenery (see below under 4). It influences design and planning of buildings and settlements whether they are dominating the landscape or subordinately embedded into landforms.

(I) Altitude difference of an area, e.g. a watershed, and (II) relief roughness (complementary elevation-depression forms) are decisive characteristics of land surface diversity (e.g. rolling hills with slope ridges, erosion channels).

The complementary elevation-depression forms of land surface are shown in Fig. 1

(e.g. rolling hills with slope ridges, erosion channels).



(white) **elevations**: (remains of) upper plains; (areas of divergent slope curves (= orthogonal trajectories of contour lines; trajectories not shown)

(blue) complementary “dendritic form” **depressions**: erosion channel network (sensu lato); (areas of convergent slope curves)

—— contour lines
— — (“ “ 2.5 m)
- - catchment boundary
— — — deep line

Fig. 1: Complementary elevation-depression forms (after Richter 1962, modified; Thomas 2007)

Landform diversity and landscape ecology

The diversity of landforms is a basic of landscape ecology of a certain region. An inventory of land surface curvature is part of landscape analyses, assessment, and landscape planning.

Observations were done for the different succession stages of spontaneous woody species combinations according to altitude (<500 m to >800 m a.s.l.) on collected stone walls at field boundaries for a part of the Osterzgebirge (Eastern Ore Mountains), a recreational region 50 km away from Dresden, the capital of Saxony (Thomas 1983; 1990; 1999). The potential height growth and the numbers of woody species within the hedgerows increase with decreasing altitude and decreasing relief position within watersheds. The reasons are increasing annual average of air temperature (4.5 °C to 6 °C), decreasing strong wind exposure on – forest free - hilltops and ridges respectively increasing wind shelter within – more plant available water containing – depressions (though the average annual precipitation decrease (<900 mm to 750 mm) with decreasing altitude. Gneiss podsols, - brown earths, -gleys are dominant due to relief positions).

The samples of the spontaneous woody species combinations were investigated for 8 classes of the vertical relief position and of the horizontal curvature-tendency in watersheds / catchment areas after the following matrix:

convex **concave**
horizontal curvature
(divergence convergence
of slope curves)

1 hilltops and (remains of) upper plains;
2 vertical convex upper slope areas 3
of (remains of) upper plains;
4 stronger inclined middle slopes, 5
partially with remains of valley terraces;
6 vertical concave foot slopes 7
and valley ground plains;
8 near deep lines; riversides

(for 8 no differentiation in convex or concave horizontal curvature).

More than 300 representative samples were done from 1970 to nearly 1994 (Thomas 1990).

The potential height growth of the spontaneous woody species combinations increase from < 6 m to more than 30 m with decreasing altitude and relief position within watersheds / catchment areas. The number of woody species increases with decreasing altitude from 4 to more than 25 within hedgerow parts of 20 to 50 m length. The relative maxima of hedgerow height growth (and the number of woody species) are in coincidence with the relative minima of the ground surface and vice versa. This principle is valid for rolling hilly or mountainous (sedimentary or soil covered rocky) landscapes without forests on hilltops and ridges.

The absence of hedgerows after removing results in less attractiveness of scenery for ramblers and visitors (communal area of Liebenau (Fig. 3)).

Disadvantages of non-native woody species in hedgerows on agricultural land

Non-native woody species, planted in the agrarian fields and open grasslands, “can destroy the specific character of the landscape; drive out rare species of open lands and their living spaces appeared; endanger the genetic diversity of indigenous species; change the natural sites of animal species, depending on the plant species (pollinators, parasites, eaters)” (Reif; Nickel 2000). Large masses of non-native woody species occupy a lot of areas and space within the agrarian land which should instead usable for the worth protecting native woody species flora, instead of protection of the natural biological diversity of the landscape, of the species diversity and the intra-specific genetic diversity and differentiation of regional plant species origin. This

may result in appearance of native woody species and eco-types. Native plant species developed special forms and eco-types in geographical regions during evolution without human impact (genetic adaptation of populations of a species). This diversity is also the basis for future evolutionary processes (genetic adaptability). This biodiversity (genetic variability and intra-specific differentiation) must be protected. For example should be used only seed material of regional origin of native woody species for hedgerow plant material (Reif; Nickel 2000). It should be “never used non-regional plant material within the open agrarian landscape” (Reif; Nickel 2000). Plants of seeds from the region are to be used for planting (to avoid introgressive hybridization with eco-forms from other regions and destroying the natural flora.Hedgerows should contain large parts of regional genetic biodiversity to prevent distortion of the flora. This opposes against an increasing uniformity of regional eco-types by introgressive hybridization (hybridization between species, partially from other regions, followed by successive re-hybridizations with parent species) (Reif; Schmutz 2001). Non-native woody species are often not or much less eaten by native animals, insects, birds, mammals a.s.o., because of missing mutual evolutionary adaptation.

4. Perception and cognition of scenery and human preferences depending on land form diversity and built environment

Objective aspects of perception and cognition allow descriptions of visible landscapes. Cognition and aesthetic assessments also contain inter-subjective and personal factors). The complex perception and experience (cognition) of the landscape depends on the landforms:

(1) viewing (the sensory information) and (2) cognition (psychology of perception):

(2.1) symptomatic information: understanding of symptoms of landscape characteristics that can not be recognized directly – due to filter effects;

(2.2) relics of former landscape use: historic cultural landscape and town parts;

(2.3) expression: initiating emotions (individual; inter-subjective);

(2. symbolic meaning: indicates imaginations, ideas, theories, utopian pictures, ideals. Methodological contributions are needed for analyses of the shapes of natural and cultural landscape with the built environment. An overview about the characteristics for objective description and assessment of landscape scenes and urban forms is given in Fig. 2, in connection to tables 1 to 4.

A. Filters of perception and cognition

There are objective spatial, temporal and cognitive limitations to the perception, cognition and emotional processes as a result of so-called filters: spatial, temporal, and situation-specific filters, normative filters on cultural history, and individual moments:

Table 1: **Filters of perception and cognition**

visual: barriers of relief and e.g. buildings, obstructing the view; precipitations and atmospheric clouding; air pollution, global dim; artificial light pollution; sight penetration e.g. into forests of different density, also varying by seasons; pulsation of sight volumes due to day-time, seasons; seasonal aspects of flora (colours, flowering); focussed viewing; selective directed view, following moving objects; optical illusion (Fata Morgana, ...);

aural: power, frequence, distance of point or linear sound sources; sound spread depending on weather and reflecting or absorbing materials; sounds caused by wind and weather; streaming water, surf; animals; humans; production and infrastructure; masking noise; sound barriers;

olfactory: power and distance of odour origins; depending on temperature, field of wind, seasons;

haptic: plants, animals, clothing, materials; movement on foot, by vehicles;

kinesthetic: very steep slope; deep snow or ice on steep slopes; busy traffic; strong winds;

intellectual: emotional, social, cultural-historic: knowledge; spirit of the age; normatives;

each varying due to innate, hereditary and learned associations and reactions; imaginations, ideas, theories

B. Perception: Viewing the landscape scene and multi-sensory experience of the landscape (sensory information)

Perception of scenery in view-sheds takes place in different fields of view in upper relief positions and lower sites:

Table 2: **Fields of view**

panoramic views (from hilltops) over a plain or different valleys	360°
circoramic views (e.g. over some valleys)	270°-360°
partially „panoramic“ (over one or more valleys	90° -270°
sectoral (over one or more valleys)	<90°
views into a gorge, can~on	<<90°

The perception of scenery is potentially realized according to different depths of view, e.g.:

Table 3: **Depth of view within fields of view** (distance zones)

f	**foreground** up to	0.4 - 0.8	km distance
m	**middleground**	0.8 – 8	km
b	**background**	8 - 100	km

The landscape scenery is perceived as – **V** – space-defining vertically perceived surfaces / "walls", varying from confined views to panoramic views. The visible landscapes may contain – **D** – space-accentuating vertical dominants within fore-, middle-, and background (e.g. mountains, rock needles, towers, tower blocks, solitary trees) or elements / areas of different noticeable colours or textures. Description and assessment of scenes can be done using the basic 2:3 matrix:

Table 4: **Description and assessment of scenes** as shown on the basic 2:3 matrix

		f	**m**	**b**
V	vertical visible ranges, surfaces, one behind the other; settlements; forest fringes; (m,b); water areas (mirror effects) (f,m);	Vf	Vm	Vb
D	3 to 5 dominant single elements are immediately perceptible, more seem to be combined to a wall V (m,b); moving waters, animals, (f,m).	Df	Dm	Db

The basic matrix (Table 4) should be completed and extended for the above mentioned fields and depth of view (Tables 2 and 3) according to the four points of the compass, North, East, South, West, 90° each. Additional attention should be paid to the time axis: The above scheme may be sufficient for climatic regions with no seasonal variations (high precipitation all over the year or dry deserts with (nearly) no precipitation throughout the year). In other cases the scheme may be used for the existing seasons repeatedly: two times for regions with a dry and a high precipitation season; for three seasons; or four seasons for temperate climate in the northern and southern hemisphere: spring, summer, autumn, winter (Fig.2). Seasonal changes of transparency of deciduous forests and hedgerows may cause different kinds and distances of the frame confining walls - V - (e.g. forest fringes or hedgerows and deciduous tree rows of avenues are the „walls" during spring to autumn instead of hill-slopes behind them, which are visible and shining through in winter).

So there are seven vectors, describing the objective criteria for the sensory information according to space (I – III); dominant objects, vertical or areas (IV); direction of confined views (V); time (VI); places of historical interest (VII):

(I) depth of view within view-sheds (f, m, b) (indicates length);

(II) horizontal angles of confined fields of view (width); (III) vertical viewing angles (indicates height, not only the altitude difference in the view-shed in relationship to the distance of e.g. mountain ridges, but also the elevated surfaces of vegetation cover, or settlements above bare ground ("V" for vertical "walls")); (IV) number of dominants D for each distance zone (I), viewing direction (V) and viewable valleys (II); (V) direction (N, E, S, W); (VI) temporal vector, number of seasons according to climatic zones (one to four); (VII) historic sites.

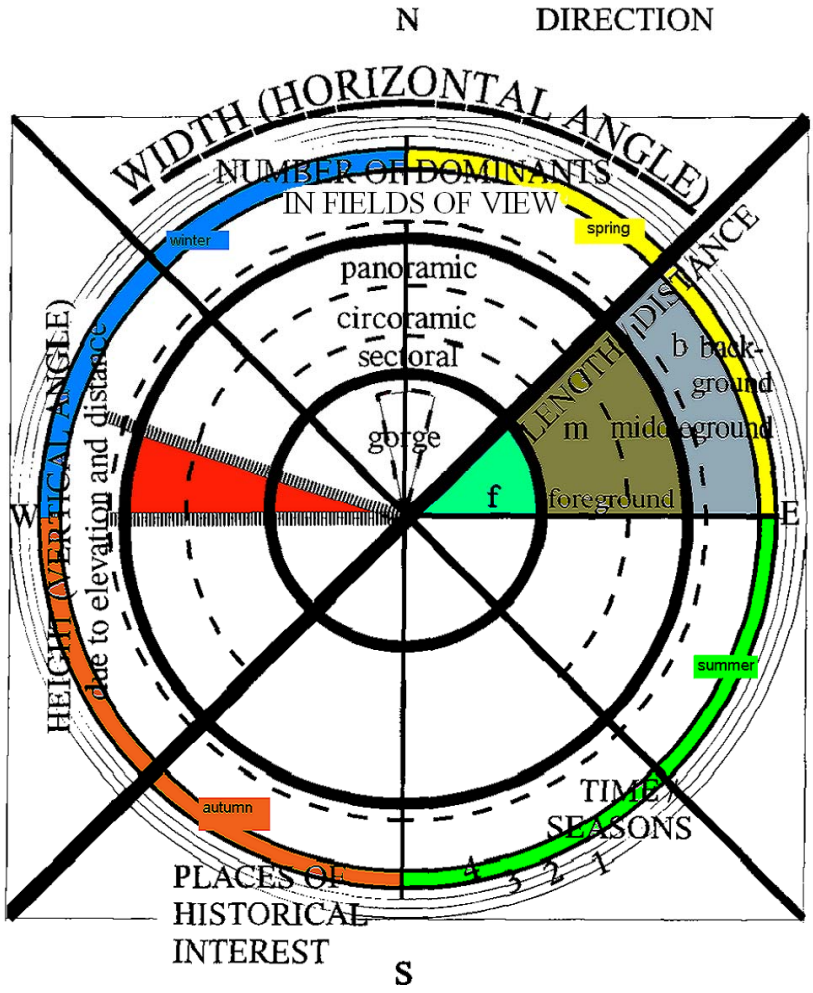


Fig. 2: A scheme for visual landscape perception, description, and assessment (Thomas 2007)

C. Cognition and aesthetic evaluation

The second phase, the cognition and the aesthetic evaluation, contains more subjective aspects (personal and inter-subjective). The scenic beauty estimation attempts to define the visual preferences of humans.

D. Laws of gestalt psychology

Gestalt psychology explains rules of cognition: constancy of perception: constancy of form, colour, brightness (an object is recognized though it is viewed from different perspectives (Goldstein 2002:188)); size-distance relation; figure-ground relation; centre-surroundings-antagonism; ambiguous pictures (riddle pictures); „law of nearness" and spatial effects; „law of similarity" for landscape elements and their gradients of size, density, forms, brightness, colours, contrasts; „law of completion to a simple form"; completion to a "desired" form; „completion to symmetry"; „law of the same destiny"; proportion (e.g. sectio aurea). An objective landscape is provoking a subjective cognition of the landscape scenery (Nohl 2001:233).

E. Imaginary superficial resemblances

Imaginary apparent resemblances („morphisms") are suggestive examples of the „law of similarity": For instance the Sydney Opera House may remind one of

* sailing ship(s) (techno-morphism);
* clouds mirrored in the water (clima-morphism);
* shells (zoo-morphism);
* monsters in moonshine-twilight: "
  sharks, opening their mouths; mystery, nightmare

as an example of ambiguity of cognition and symbolic meaning.

F. The scenery preferred by ramblers based on observations on Whit Monday 2005

For estimations of preferred landscape scenery it is necessary to observe the numbers of visitors in different landscape parts, watersheds / viewsheds, or conduct surveys of a certain number of individuals.

For a part of the Osterzgebirge (Eastern Ore Mountains), a recreational region, we could find: At one extreme, no ramblers could be seen within the flatter open fields of Liebenau, the watershed of the Liebenauer Bach (stream) with a relatively small altitude difference Δz, and crop fields without hedgerows (that were removed a long time ago), and with very small forested areas. Increasing numbers of ramblers were found in the more diverse communal open fields / watersheds, richer in hedgerows and forests on steeper slopes. The greater the altitude difference Δz, and the higher the maximum altitude z_{max} the more visitors / hikers appear in the watersheds / viewsheds in good weather (Fig. 3). The ramblers were counted for entire watersheds (H, Fau, F, Lw). The watershed of the Liebenauer Bach (Li) extends outside the observed area. Only the right sides of watersheds, the right hillsides of the streams Erdbach and Rotes Wasser are included for the small medieval towns Geising (G) and Lauenstein (L). On the excluded left hand sides and also south and west of the investigated region, there are mountains of some higher altitude within the middleground fields of view („m"). In the surroundings of the small medieval towns Lauenstein (L) (with small old fortress ruins and renaissance/baroque castle with a well-attended museum) and Geising (G) the number of ramblers may be greater than that counted during the survey. Possibly more ramblers were hidden on paths within forests on steeper slopes, the hillsides on the right (G, L) when counting was done. Six of the observed areas are nearly 3 to 6 km^2 in area, while only the part of the Heidegraben watershed (H) is smaller. So obviously the number of the ramblers observed is only slightly influenced by the varying size of areas. At Whitsun 2005, in sunny weather, many visitors came to Lauenstein castle and the small market square and also to a wildlife park in the valley of the Rotes Wasser. It

was the aim to count only hikers in the open fields. The results corresponded with similar observations made over several decades and confirmed the expectations.

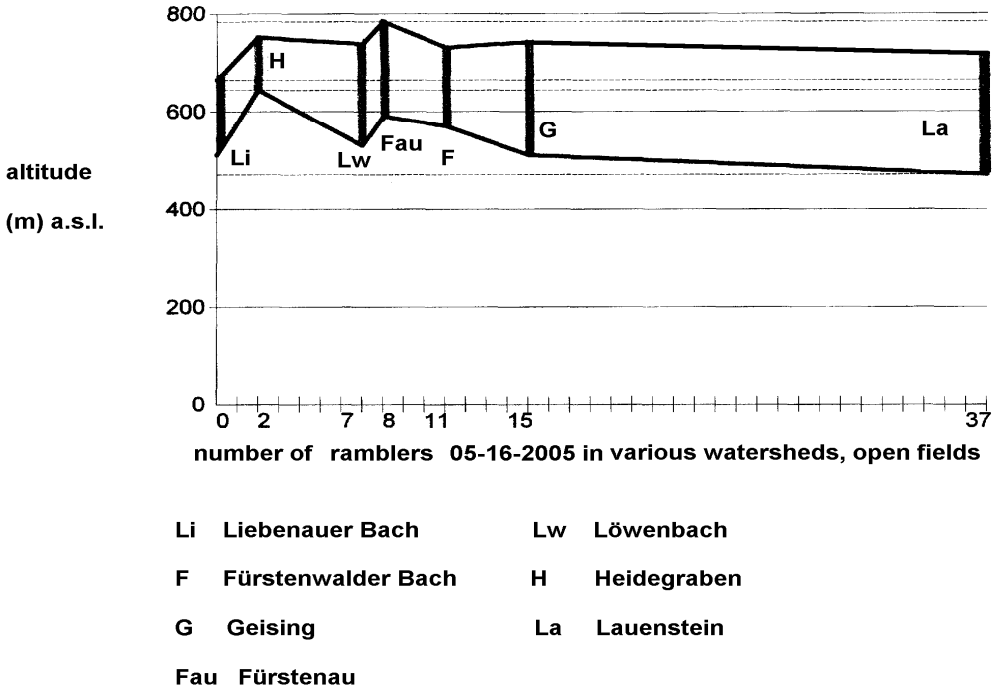


Fig. 3: Number of ramblers in various watersheds of different altitude difference (and correlated relief roughness)

G. Reflections of natural and cultural landscapes in arts (table)

Table : Aesthetics of nature and landscape, and aesthetics of art
Aesthetic and artistic perception of landscape:

Real ***landscape***	***painting*** / graphics	***poetry / literature***	***music***
time sequence	-		**+**
objective	(momentary	indirect,	immediate, model
subjective	representation)	provoking	time-lapse
		imagination,	tempi: peaceful / slow
speed		synaesthesy	to raging fury
			variations: accelerando / ritardando; rubato
space	(+)		(+)
	in perspective:		echo effects,
	gradual grey / colours,	"	variations: crescendo
	sharpness of outlines,		/ decrescendo, diminuendo
	2D generate concrete		general rests
	3D illusions		generate general space
			illusions (vastness, narrowness)
tone, melody	-		**+**
(e.g. bird's singing)			instrumental music
sounds (e.g. streaming		"	vocal music
media: wind, water)			setting literature to music; song, opera
			(incl. zoomorphism, climamorphism)
temperature	-		(+)
			frost-clink and
		"	tremolo as tremble, shiver,
			shattering teeth
			in Vivaldi's „Winter"
smell	-	"	-
natural landscape /	(+)		(+)
altitude by degrees:			
plains lowland			cheerful, reassuring,
hills hilly		"	curative (to dismal)
mountains mountainous			sheering up, activate
high mountains alpine			frightening to dismal
cultural landscape	(+)		+
		"	citations of traditional,
	architecture / sculpture		folkloristic music, -lied,
	buildings, monuments,		-dance, ... (regional)
	(dance = moving human „sculpture", setting „sculpture" to music)		
	gardens, ...		citations of earlier music
	eclecticism (technomorphism)		
			ambiguity of cognition of symbolic meaning:
	Sydney Opera House: Sailing ship(s) ("); clouds mirrored in the water (climamorph.); shells (zoomorphism)		
agrarian landscape			

"All art constantly aspires towards the condition of music" (Pater 1877).

\- no immediate visual / acoustic reflection, provoking reminiscence of direct perception
\+ immediate representation, models; described objects and processes as direct imitation, with abstractions, variation and thematic processing, included into peculiar music, art
(+) only illusionary reminiscence

5. Conclusion

The more extensive the roughness of terrain carving, the more diverse is landscape ecology, and the more diverse is also the scenery. This is interrelated with e.g. abundance and diversity of spontaneous woody species communities in hedgerows under temperate climatic conditions. The basic principle is commonly valid for all climatic conditions.

A commonly valid scheme for the description and assessment of scenes and planning / design alternatives is proposed. Conclusions could be of interest for analyses of natural landscapes and the planning and design of cultural and urban landscapes.

The purpose is to describe some aspects of design and planning on a landscape scale depending on landform diversity. It helps to manage diversity of landscape ecology and scenery simultaneously.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design as Activism

A Conceptual Tool

Ann Thorpe[1]

Abstract

Although literature on design as *activism* is thin, there is increasing frustration and urgency over designers becoming activists. With participation in social movements and expectations for social innovation on the rise, interest in design activism will only increase. Yet designers are wrestling with the notion of activism: What is it? Can we encourage it? What are its best practices? Design lacks a good conceptual framework for activism, but fortunately sociology has one to offer, a typology of activism. This paper describes research that adapts sociological methods to establish this conceptual tool for design, enabling a more robust debate and use of design activism over time, and across causes and disciplines.

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Introduction

Consider a few interesting cases of design activism at work:

- To raise money for landmine clearing, an industrial designer develops handsoap that is a full scale model of a landmine—a landmine that is "washed away" by the purchaser's contribution.
- Architects propose a portable "day laborers' station" to meet the needs of Central Amercian day laborers in California.
- Global Green runs a design competition to solicit proposals for eco-sensitive, affordable housing for New Orleans residents made homeless by Hurricane Katrina.
- Desigers build a set of five secular, mobile "chapels" that rove around offering people contemplative respite from the rush of modern life.

The examples above are all cases from my research on design activism. For the purposes of this paper, I define activism as taking intential action to instigate change on behalf of a neglected group. As the examples above show, designers are working across a range groups and issues, ranging from victims of war or disaster to minority groups. But they also encompass less recognized "groups" and more subtle changes, such as the call to *slow down* embodied in the mobile chapels. Ecological design represents change on behalf of earth's ecosystems, a quintessentially neglected, even wronged, group.

In these cases, sometimes designers themselves are the activists, sometimes they are "activists for hire" working for nonprofit or public groups. In each case the actions have as their bottom line a social or environmental cause, as opposed to a commercial (eg profit-making) cause. This distinquishes my cases from instances where, for example, companies green their corporate headquarters or launch green products. These cases of "corporate design activism" are of less interest in my research—not because they are unimportant—but because I feel they represent the tail of design activism rather than its leading edge.

Activism is a dynamic process. It starts when groups within society call for change, and society responds --either resisting, or incorporating the values encapsulated by activism. Thus as environmental activism proceedes, for example, "green" products (e.g. recycled, reusable, energy efficient) gain a certain normative position and cease to be at the cutting edge of activism. Gradually the public sector steps in and requires a higher "green" performance across all products. This process gradually raises the bar so that businesses do more, governments change policy, and activism pursues yet new areas that have been neglected, but that need attention. My interest in this research is to capture design's role at the leading edge of this process.

Aims

This paper's aims are to:

- Outline design's stumbling blocks with respect to activism
- Provide an overview of how sociologists understand activism and show its relevance to design
- Present initial results from my research on a typology of action for design activism

Design's stumbling blocks

My professional and academic experiences all suggested to me that the field of design is wrestling with the notion of design as activism: what is it? Is there a way to define a best practice for it? How can we encourage more of it? It strikes me that until recently there have been two obstacles in the path of design activism. The first obstacle was the absence of the right context in which to be activist.

The professionalizing of designers as "servant problem solvers" prevents most within the discipline from characterizing themselves as "activists" or advocates, even if that is what they are. Designers typically view themselves, and others view them, as commercial actors. Designers are trained to respond to clients and consumers, and to add value to businesses (Dormer 1993; Heskett 2002). Governments develop policies that position design as a tool of economic growth (Heskett 2002). Professional design associations largely concern themselves with business practices and responsibilities to clients (Thorpe 2007). Even design schools tend to frame their work as educating employees for the "creative industries" rather than as educating change agents. Within the confines of commerce, most designers lack the right context in which to be activists. I have written elsewhere about design's position within the economy and how designers need to actively use the economy (Thorpe 2007, 2008). Fortunately new contexts are emerging, particularly with the rise of the third sector, also known as the nonprofit or "social" sector, but also with the notion of social enterprises (Thorpe 2008).

But it was only when I began to look at how activism is studied within social movements that I understood the second obstacle. In the study of social movements scholars have developed a conceptual framework for activism, allowing them to understand, debate, and critique it across various movements and groups. This framework is the very thing that designers seem to lack. In terms of social movements, this framework is known as the "repertoire of action", a standard range of actions that activists deploy across a range of causes, social groups, and across time, to make claims for change (Tilly 1995). The repertoire is basically a typology of action (I will use the terms "typology" and "repertoire" interchangeably) in which actions are like a set of jazz standards that everyone knows, but that are improvised and combined in many different ways. Activism in this sense is not only what people do, but also what people *know how* to do.

This prompted me to consider whether design also has its own set of "jazz standards" that are used to make claims for change — a set of actions that are relatively consistent over time, that cut across causes and disciplines, that everyone knows how to do. I initially tested the repertoire concept on design activism using my own knowledge and ready–to-hand sources to compile a list of about 50 activist design projects. Analysis of this list suggested to me that there are some "jazz standard" actions for design activism. For example, designers seeking change on social or environmental issues will often organize competitions to solicit new visions or to award prizes that will help implement the best new visions. This action of organizing competitions cuts across all design disciplines and many causes, such as the environment, justice, cultural diversity and accessibility. Other jazz standards, which also cut across discipline and cause, revolve around artifacts:

- service artifacts (eg emergency shelter) that provide humanitarian aid
- demonstration artifacts (eg an extreme green building meant to be a model for others) that offer positive alternatives to the status quo
- protest artifacts (eg the landmine soap mentioned at the start) that may be confrontational or even offensive, but offer a critique prompting us to reflect on the morality of the status quo

Once this framework, this set of jazz standards, is actually proposed for design, it looks almost simple and obvious, belying both its power and the significant task of developing and generalizing it. Although anyone can sit down, as I did, and brainstorm on actions that designers

might take, or have taken to make claims for change, such a list can only be speculative and anecdotal. Without any systematic empirical research we really don't know:

- what types of action designers have actually taken, across the board, over the past 15 or 20 years (eg what actions comprise the set of jazz standards for design activism)
- How design disciplines might be utilizing specific actions in the repertoire and for which causes
- To what extent designers take up "conventional" versus "designerly" forms of action
- Whether or not certain actions cluster together in time or in discipline
- How actions are innovated over time

Once we establish the range of actions in the repertoire and begin to understand some of their patterns, it becomes much easier for future research projects to propose best practices for a given action type, or to critique the effectiveness of various actions, compared to other actions that could have been taken.

Although there are obviously many ways to study the subject of design activism and gain insights about it, my research is aimed at developing a generalized typology of action for design based on systematic empirical research. It is in this sense that the methods and approaches from sociology, which I present below, make the research question possible, particularly since this type of large-scale survey approach is relatively uncommon in design research. The absence of method perhaps explains why a robust conceptual framework for activism is so far missing from design discourse.

Activism and social movements

In sociology terms, activism is the public face of social movements. It is generally taken to be the public display of making a claim for change, in contrast to the day-to-day, behind the scenes administration of groups and causes (McAdam, Tarrow, and Tilly 2001). Social movements are generally defined as mobilized networks of people and groups that, having developed a collective identity, participate in collective action (activism), mainly by means of protest, to bring about change (Rucht and Neidhardt 2002; Della Porta and Diani 1999). Movements may have many participants and run a number of campaigns over a period of years. Though they include organizations, movements are not themselves organizations (Rucht and Neidhardt 2002). Movements run in cycles, and if successful, they typically result in the institutionalization of the change they sought.

Social movements cover a wide range of issues and actors, from gender issues to peace and the environment. There are also movements based around justice, health, poverty, development, mental health, animal rights, and even relatively "dry" topics such as intellectual property. There is a growing body of scholarship on social movements, and three of the pioneering American scholars, McAdam, Tilly and Tarrow, argue that there is by now a "classic" social movement research agenda based around three key theories as to why people take collective action (McAdam, Tarrow, and Tilly 2001):

- Resource mobilization/mobilizing structures: people participate in social movements when organizations and individuals step forward to mobilize resources on behalf of a cause.
- Political opportunity: people participate in social movements when viable opportunities appear.
- Collective action frames/collective identity: people participate in social movements because of the way the issues and actors are framed culturally and emotionally by the movement and because participants in movements can help frame issues and actors.

Among European scholars there is also a school of research on “new” social movements, which adds a fourth theory for explaining social movements, as follows (Dalton and Kuechler 1990):

- Social paradigm: people participate in social movements because they are concerned about the greater good and how it may be harmed by long standing, dominant political goals (such as economic growth) or the way people’s interests are represented in politics and culture (such as direct democracy vs. representative democracy).

A final component of the classic social movement research agenda concerns the strategies and actions that movements use to achieve their objectives. McAdam, Tilly and Tarrow identify these actions as the forms of claim-making, or calls for change, that people use in real-life situations (McAdam, Tarrow, and Tilly 2001). Others call it simply “protest,” noting that protest in and of itself is, “a telling indicator for problems which are neither registered nor dealt with in an adequate manner” (Rucht, Koopmans, and Neidhardt 1999, 8).

Strategies and actions

Social movements are an accumulation of many different actors taking many different actions, but held together by shared beliefs, or a shared claim with some notions of how to achieve it. Jordan describes how activism is in many ways a moral undertaking, in that it seeks to put forward a vision of what constitutes a “good” life, for example, activists might suggest that a good life is free of oppression, injustice or war (Jordan 2002). He characterizes three broad stratregic trajectories for the types of change sought by activists:

- reactionary, or looking to the past for a vision of “the good life” (examples include the US Patriot movement based on civil war times, or religious fundamentalism based on historic religious texts)
- reformist, or looking to the institutions of the present for a vision of the good life (examples include cases where existing representative government controls and determines change: reform to gun control laws, reform to pension laws or reform to environmental regulations)
- visionary, looking to the future and inventing new visions of the good life (examples include the Zapatista and Aboriginal movements that call for the rights of indigenous peoples to be citizens but also to control their lands and communities, or movements to reclaim the streets for all users, instead of accepting the dominance of cars)

In addition, Jordan explains the moral basis underpinning the acts people take for social change. He notes that much of activism intends to make an injustice or oppression unavoidably public, thus forcing those who witness it to “decide if they can live with the moral deficit produced in themselves in the face of an unavoidable demonstration of what is better” (Jordan 2002, 58). The main strategies for accomplishing this demonstration of “what is better” are the non-violent approaches of civil disobedience (or non-cooperation), direct action, and bearing witness. From time to time, violent approaches (sometimes unplanned) also emerge. Within these broad strategies is where we find the standard types of action, the “jazz standards” of activism.

In 1977, based on a study of French protest over several hundred years, Charles Tilly pioneered the notion that there is a “repertoire” of actions that “actors” or activists use and that it is relatively stable (Tarrow 1999). Tilly notes:

> “by analogy with a jazz musician’s improvisations or the impromptu skits of a troupe of strolling players…people in a given place and time learn to carry out a limited number of alternative collective-action routines, adapting each one to the immediate circumstances and to the reactions of antagonists, authorities, allies, observers, objects of their action, and other people somehow involved in the struggle” (Tilly 1995, 27).

Other writers on forms of action have generally embraced the repertoire concept and much literature usefully applies and extends the concept (see for example Olzak and Uhrig 2001; Rolfe 2005; Clarke et al. 2007; Crossley 2002), which gives rise to several major themes in the literature on repertoires. The first theme is of one of constraint and stability. The known repertoire constrains what people do but at the same time maintains a stable body of knowledge about what to do. Tarrow notes, "the repertoire is therefore not only what people *do* when they make a claim; it is what they *know how to do*" (Tarrow 1995, 91). The second theme is of collectivity, including notions of groups and identities and questions as to how to register the rise in what scholars term "individual" activism (Munro 2005). The third theme is innovation; although repertoires provide stability, they are innovated over time as some forms of action disappear or become less prevalent while new actions emerge. The fourth theme is one of modularity; a given repertoire contains a range of modules that are combined and deployed according to circumstances.

At this stage it may be useful to present a list of some of the most common actions that are in the popular contemporary repertoire, such as the following:

- Marches and demonstrations
- Bans and boycotts
- Petitions
- Strikes
- Barricades
- Sit-ins and other forms of non-violent civil disobedience
- Bearing witness
- The formation and offering of "alternative" versions: students offer alternative courses
- Symbols of identity and affiliation: eg the red AIDS ribbon
- Pamphlets/pamphleteering
- Vigils
- Legal obstructions
- Destruction of symbolically meaningful objects

Tilly and others have articulated a number of benefits derived from the repertoire concept. Tilly originally hoped the term would help codify knowledge of the existing forms of collective action, allow a generalization of the question of how these forms change over time, and hypothesize that prior history constrains the current action, "in partial independence of the identities and interests that participants bring to the action" (Tilly 1995).

Tarrow has suggested that the most important contribution of the concept is how it allows us to "disaggregate" the general notion of protest into its conventional and non-conventional forms. Tarrow and Tilly have both used this aspect of repertoire to look for the ways in which repertoires change over time relative to other factors such as political or economic structure. They both agree that innovation in the repertoire typically happens around the edges, leaving the fundamentals unchanged. Tarrow suggests that cycles of protest bring about changes in the repertoire noting, "they [cycles] are crucibles in which new weapons of social protest are fashioned" (Tarrow 1995, 94).

To summarize, social movement scholars suggest that the concept of repertoires benefits our understanding of activism by allowing us to:

- Describe social movements in generic terms such as skills, social forms and so forth, instead of strictly in terms of causes and issues (eg peace, ecology or race).
- Compare actions over time

- Explore patters of activism: how strategies and actions interact, clustering of actions
- Critique social movements in terms of their selection and deployment of actions from the repertoire
- Set innovations of action in the context of the repertoire

Adding to this list, practicing activists suggest that a benefit of the repertoire of action is that it facilitates a proactive approach. Activists can strategically evaluate the actions they take. Let me now argue for what I see as the benefits of the concept for design activism.

Typology of action: benefits to design

In terms of making claims for change, the typology of action enables designers to plan and assess their work in two ways that have not been readily available before. First, the concept directs them to think about actions they might take relative to other actions available in the typology. In a more design-centric approach, architects lobbying for environmental change, for example, typically focus on “green” building and examine the technical, aesthetic and material features it should have. Using a typology of action, they might instead ask, “what does the action of doing a demonstration building achieve in terms of our cause, compared to other actions we could choose?”

The second way the typology enables designers is by directing them to think explicitly about the fact that they are calling for change and to consider how their actions might fit into a broader social movement—should they focus on something that supports ongoing activism in an exisiting movement? Or is there an action they can take that would fill a gap?

As activist Randy Shaw points out, in a campaign for change you avoid tactical mistakes by discussing the possible pitfalls associated with an action and how they might jeopardize the ultimate goal (Shaw 2001). This, he suggests, is the benefit of contemporary “proactive” agendas—it forces activists to think through the connections among various steps along the way to social change. Yet this “connective thinking” in terms of change is something that designers rarely do.

This failing becomes apparent particularly when designers, trapped in a conventional design mode of thinking, try to compare and debate activist and non-activist projects. This difficulty is exemplified in the area of “best practices,” a conventional concern of design. Best practices for commercial design are constrained largely, at the end of the day, by commerce. But what constitutes best practices in design activism? What is the best way to make a claim using the tools and techniques of design given the changes we are seeking? Within the common conceptual framework of design case studies—comparing which green building is best, or how practitioners create products for humanitarian needs—we can get a comparison of design solutions, and these will always be important. But it is only by considering types of actions and social movements, that we can begin to get a comparison of “change” solutions brought about through various design practices. A few more examples help illustrate this point.

Product designers might argue that consumerist design de-emphasizes skills and thus disables users. They might critique labor saving devices and propose new methods for design such as “co-creation with users” or “designing communities,” (see for example Manzini 2006). But by switching to a typology of action, they might consider where and when an action involving self-build is more or less useful than devising a symbol of affiliation for “enabled” users.

A graphic designer asserts that we must use indigenous visual traditions and folklore to develop and apply an awareness of local cultures in the face of tremendous global pressure toward a dominant western design; she teaches classes in which students undertake this kind of research (Blankenship 2005). But without the concept of a repertoire she might not consider other actions such as providing services to those in need as a way of uncovering folklore and visual traditions.

In assembling exhibitions or catalogues of design for a cause, the actions are typically evaluated in a “how to” design sense, rather than a “why to” cause sense. For example, collections of objects made from recycled material typically emphasize issues such as availability and visual quality of material, production challenges, or the whimsy and wit of the objects (Dehn 1996, 2007; Dintenfass 1997-98). Using the typology of action, a designer assembling such a collection might examine how and why these demonstration products perform in the cause to reduce waste, versus other potential design actions for the same cause. Further, how do these actions fit with the broader social movements aimed at reducing waste?

The actions in the repertoire cut across disciplines and aesthetic movements, which also makes the concept significant. It may be tempting to assume that if you’re an architect, your activism will involve making a building and if you’re a graphic designer, your activism will be to make information visually accessible. But empirical evidence dispels this notion, a notion that is only likely to further dissipate in the future. Julier commented that a prominent design activist he’s spoken to describes himself as “media agnostic”—the result might be a building, or it might be a radio station (Julier 2007). Although it’s an extreme example, as all designers pick up more digital media influences, media agnosticism is likely to increase. And this agnosticism is another factor that makes a typology of action useful to design activism, since the typology facilitates discussion of actions that cut across media and causes.

The repertoire concept also gives design a way to reflect on what is new in terms of design activism, rather than simply in terms of a material, a physical form, a method or an aesthetic movement. As Tilly and others have observed, the repertoire holds fairly steady, but where are the innovation in actions? Could designers consciously innovate the typology by borrowing actions from other repertoires? What are the new ways of furthering a cause? Are they relevant to other activists? What cultural or political influences are at work on the repertoire?

The types of debates and questions that I outline above suggest the range of benefits that may result from using a typology of action as a conceptual tool to explore design activism. In the next section I explore how social movement scholars develop typologies and how to adapt their methods to design.

Methods of studying actions

The general method of research to describe and assess repertoires of action is known as “protest event analysis.” It is based on the notion that the repertoire is manifested in real life through a series of collective action events such as protest marches or boycotts. Event analysis seeks to collect and analysze historical information about these events, typically in the context of a country, over a set period of time (Koopmans 1999). Ideally the researcher would have information about every event that took place during the given period in the country. The reality, of course, is much different, and researchers are faced with the question of how to find out about as many of the events as possible so as to paint a representative picture of the actual activity during the period. Typical sources are newspapers and police records. Rucht and Neidhardt have profiled the challenges associated with these sources in detail (Rucht and Neidhardt 1999) based on their German ProDat project, which contains 10,000 events over more than 40 years.

Before looking in more detail at the method of collecting and analyzing data for event analysis, I will consider how the general approaches of “event analysis” or “collective action research” may suit design. How can we take the essence captured by the concept of “event” and formulate it in a way that is applicable to design? And how should we factor in the notion of collectivity or geographic location?

The essence of the term “event” has several components. The first is that it automatically narrows the definition of activism, eliminating all the day to day, behind the scenes work of activists and focusing on the public display of claim-making. The second is that it has specific time-space connotations that also neatly delimit a unit of study. Design, on the other hand, tends

to be organized around processes (eg development, production, use) and their outcomes in artifact form, rather than events. For this reason, the purposes of my study are better served by a term such as “occurrence” or “instance,” both of which suggest something happening, but without specific time-space constraint. I have developed a definition of such a happening in terms specific enough to constitute a unit of study, as shown in Box 1.

Box 1: The unit of study

definition of an instance of design activism

1. Claims are made and directed at other actors, either at political decision makers to change/influence their decisions or at members of public to change their behavior.
2. Claims are made on behalf of a neglected (deprived, excluded) group.
3. The instance can be either client- or designer-led, and for this reason public agencies (often the clients of design activism) are not being excluded as actors, as they often are in protest event analysis.
4. The action is not commercial, that is to say, the bottom line, or priority for the design work is largely environmental or social. Businesses are generally excluded as actors except in the rare cases where their activism is perceived to be on the leading edge of activism as opposed to the following edge.

How should we factor in the notion of collectivity? I contend that almost any designed artifact stems from collective action. In its classic form, the collection of actors would include the designer and the client, possibly the end customers. Most design processes also typically involve various experts in technical and social fields such as engineering, ergonomics, anthropology, psychology and so forth. In design activism, the collection of actors is somewhat different and often includes other activists and stakeholders in a claim (or cause) and “client” organizations are nonprofit or public groups rather than companies. In most cases, therefore, design results from a collective process, although the collection of people may not assemble in the form of an “event.” The important point is that design activism typically does reflect a collective effort to make a claim, and in this sense it represents collective action.

Event analysis research has typicall been country-specific (Tilly’s work on France, Rucht’s work on Germany, McAdams work on America). But choosing the context of a specific country makes less sense in the case of design activism. Especially during the last 10 or 15 years, design activism is probably more closely aligned to certain approaches and ideas (such as eco design) than it is to a specific place, particularly as far as westernized countries are concerned. For example, London-based architects engaged in inclusive design are on the whole more likely to be connected to others around the world working in inclusive design than they are to be connected to other London architects who concentrate on eco-technologies such as straw bale construction.

In the end, I have chosen to let my sources dictate the geography of my study. In lieu of the newspapers favored by social movement researchers, I am using the popular design press, namely three U.S. magazines: Metropolis, Architectural Record and ID (The International Design Magazine). Although I began with five sources, I dropped the two UK publications, The Architectural Review and Blueprint, after a pretest showed that their reporting style generated very few instances of design activism. Using the design press has many of the same strengths and weaknesses found in the use of newspapers.

The widely accepted use of newspapers has several justifications. First, events reported in the mass media suggest actions that have become socially and politically “real” in their consequences by virtue of becoming news (Rucht and Neidhardt 1999). Second, as Hocke notes, an explicit aim for many protest groups is to get media coverage, using slogans, tactics and spectacular incidents to increase the chances that they’ll be mentioned in the news (Hocke 1999). Third, newspapers are typically long running publications, so it is possible to use a consistent data source over periods stretching, in some cases, over more than a hundred years.

My sources are quite long-running publications (minimum 25 years) that suit the time frame of my study (roughly the years from 1987-2007). As with newspaper reporting on collective actions, the very appearance of an occurrence of design activism in the design press brings the occurrence to the attention of the public (albeit the public that reads design magazines) making the actions socially and politically "real" in their consequences. But it also suggests that the activists sought media attention and we can infer that the action may have been reported in the non-design press (eg general newspapers) as well.

On the negative side, the design press will not report on all design activism and it may have a bias about the types of design activism is does cover (eg a preference for activism within a certain discipline or a preference for certain causes). In the end, the presence of a report in a design magazine says more about its interest to other designers than its social impact, relevance to a given cause, or position within a campaign for change. As with newspapers, using the design press is a result of a deficiency, or lack, of other sources, rather than its suitability per se.

Wading into the data

Thus my research is following a classic, event-analysis method with the aim of building an empirically based picture of design's typology of action. I am looking through old issues of design magazines to find reports of design activism that meet my definition of an instance. Upon finding these reports, the next step is to translate, or code, the report into data that can be analysed. I am identifying and coding a range of variables based on two pretests of about 100 cases each. My data, compiled using SPSS software, is non-parametric (meaning that my population of cases does not fit standard assumptions about probability distributions). These are some of the main variables I am tracking:

- form of action (eg a design competition, a demonstration product)
- cause (eg disaster prevention/aid, reduce environmental impact, improve accessibility)
- discipline (eg architecture, product design, graphic design, landscape design, lighting design)
- medium (eg building/structure, product, landscape, interior, 2D visual)
- strategy underlying the action (is it generally reformist or visionary?)
- location (continental region, country, state)
- creator of the opportunity for activism (eg instigated by the designer or by an activist client)
- financer of the opportunity
- whether students are behind the act

Given the nature of design publications, each instance of activism also typically has two or three associated images, so I am also coding my perception of how compelling the images are, as I hope to use a great many images in communicating my results to a broader audience.

At the time of writing, I have coded about 15% of what I expect to be roughly 2000 cases; here I present some of the initial analysis with the caveat that it is only based on a small amount (representing the year 2007) of the yet-to-be-compiled, final dataset. So far, I've found that the prevalence of activism is roughly proportional to the prevalence of the design disciplines. In other words, no one discipline appears to be noticably more activist than the others: architects account for roughly half of the activism, as they account for about half the employed designers (if we exclude graphic designers) according to U.S. occupational survey data (Occupational Outlook Handbook 2008).

In terms of who is using design activism, interestingly so far it appears that close to half the instances of design activism (43%) are instigated by designers themselves or by design-oriented nonprofit organizations. The next biggest group using design activism is nonprofit organizations (which includes schools and universities) at about 25%. Public (government) activist clients run at about 13%. Coalitions, companies and unknown clients make up the remaining. U.S. cases of activism make up about 72% of the total so far, with Europe contributing 10%, and Africa, Asia and the Middle East each at about 2%. About 8% of the instances of activism are characterized as “global” (eg international design competitions).

The typology of action so far has the general shape shown in Table 1:

Table 1: Intial shape of the typology of action

action	% of total	explanation
demonstration artifacts	28%	demonstrating positive alternatives that are superior to the status quo
info/communication	27%	making information visual/tactile, devising rating systems, creating symbols, making physical links, etc.
conventional actions	13%	proposing legislation, testifying at political meetings, writing polemics, conducting research, etc.
competitions	10%	
service artifacts	10%	humanitarian aid
events	9%	conferences, talks, installations or exhibitions
protest artifacts	3%	confrontational, even offensive, prompting reflection on the morality of the status quo

Meanwhile, the causes so far have a distribution along the lines shown in Table 2 below. I expect that over time I will see independent variables, such as natural disasters (Hurricane Katrina, Asian Tsunami) or terrorist attacks (9/11, Madrid bombings), influencing the causes pursued through design activism.

Table 2: Frequency of causes

cause	% of total	explanation
nature	38%	reducing impact, preserving wilderness, regenerative
community enabling	23%	education, user involvement, sense of place, relationships
human rights	13%	justice, affordability, accessibility and democracy
cultural diversity	11%	immigration, religious diversity, ethnic/racial diversity, time (memorial)
disaster relief	9%	
range of causes	4	

	%
health	3 %

Regarding the underlying strategies for activism so far, only about 15% of the cases qualify as “visionary” — envisioning new relationships and new forms rather than reforming existing ones. Eighty-five percent of the cases are “reformist.” Although designers and design nonprofits are responsible for instigating about 43% of the instances of activism, they account for a much bigger proportion—about 65%—of the visionary strategies. This may indicate the importance of designers undertaking activism themselves as opposed to being activists for hire. As proper activists, designers are more likely to help people imagine not just how to reform broken societal patterns, but to imagine and invent new ones. As Dovey notes, “empowerment” for change suggests not only the capacity to identify one’s real interests but also the need to connect those interests to a well-imagined future (Dovey 1999).

Conclusion

In this paper I have argued that by using methods pioneered in the study of social movements, we can develop an empirically based typology of action to aid us in the use and study of design activism. I have argued that this conceptual tool will enable designers to look at activist work in new ways. I have breifly reviewed the sociological study of social movements and activism and described how I have adapted those methods to suit design. Finally, despite the fact that I have only preliminary data, I have described the shape of some of my findings so far as an indicator of how the full study will unfold.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The *Roots of Change** embraced by *local food system*

Design visions, from the sustainable food system to the prospect multidisciplinary key-principles for a sustainable food development

Ana Thudichum Vasconcelos [1]

Abstract

The current paper intends to define the scope of the food sustainability concept. The idea of food sustainability carries a multidisciplinary vision of the problems that are inherent to the foodstuff production and their consumption, in a unique dimensional view composed by a network of complex relations, connections and natural inter-dependences.

Hence, the food sustainability vision is based on a series of principles, transversal to the several areas of knowledge and which have constituted the roots to a new paradigm of food consumption. Here, the design perspective is to contribute to the promotion and implementation of the sustainable food community, based on specific key-criteria. This food community is structured on the reflection of new well-being and ethical values, thus, being a model that is possible to insert in a concrete landscape and cultural reality.

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Introduction: sustainable food system

What are we talking about when we talk about food sustainability? Does food sustainability mean the consumption of organic products? Is it better to consume organic products even when, these, travel long distances issuing great quantities of carbon dioxide to the environment? Is biodiversity always related to the methods of organic production? Is food sustainability limited to environmental criteria? Does food sustainability include social issues and community-related aspects? Should food sustainability take agricultural issues into account, or simply consumption issues? Should we consider supporting small organic producers and regional food producers, so that they do not surrender and continue dedicating themselves exclusively to conventional agriculture? What benefit can we rip from a system of re-approximation between consumers and producers? What about our health? Do we protect it while consuming food, whose origin and production methods are unknown? How about our landscape? Are we preserving it, while insisting on food systems based on importation? And what becomes of traditional flavours? Are those who produce them a part of our gastronomy? If these producers give up on their fight, don't we risk losing part of our cultural heritage with them? And what happens to the small local producers, when we prefer the specialised consumption of the multinational monopoly-held systems? What happens to economic development?

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Sustainable food communities

A sustainable food system is one that is sustainable, composed of people with knowledge of the food system, locally based, as economically lucrative for farmers and farm-work, as off-farm labour, participatory, relational, fair and ethical, regulated, sacred, healthy, diversified, culturally nourishing, seasonal, and more concerned with sustainability and equity than profit (Kloppenburg and others Cit. Allen 2004, 80).

The first principle of sustainability will be to think of sustainable development as a complete system of relationships and inter-dependence. This concept of sustainability comprises the establishing of links of a network in itself, composed of several complex systems. This unique dimension of the agricultural food system is interpreted by Jonathon Porritt as "one planet agriculture" (The Ecologist 2007). This provocative sentence, by the Chairman of the biggest British association for sustained agricultural development, the Soil Association, prospects a non-retail dimension of the big problems inherent to agriculture. This means that if the agricultural food system were to be considered one only, probably the planetary benefits would be more than many.

Another statement, which symbolises a harmonious vision embracing the agricultural food problems, was made by Carlo Petrini, chairman of the Slow Food movement, when referring to the *comunità del cibo* (Petrini 2005, 234). This vision involves the understanding of the food system as one only, made by people for people. The *comunità del cibo* refers to the sharing of transversal knowledge of food-related issues, in which the communication channel gives privilege

to social relations, which are inherent to the productive universe and food consumption. Speaking of “one planet agriculture”, or of “a food community” is the same as saying that the agricultural food system is one only, composed of a complexity of relations and connections, based on the several aspects of human life: nature, economics, social and cultural aspects. These several dimensions of the system are often enunciated as the three big pillars: economic, ecological and social sustainability (Mulier, 2), or as the *trinità* (University of California Sustainable Agriculture Research and Educational Program, Cit. Allen 2004, 83) of the agricultural food sustainability. These three big areas of sustainable food development are described as follows,

… Economic, by providing producers with a profitable route market; environmental, by cutting down on the pollution associated with food transportation, and by raising interest in consumers as to how the land around them is farmed; and social, by encouraging a sense of community between buyer and seller, town and country (The Policy Commission on Farming and Food, Cit. Sustainweb 2002, 3).

If we are to consider cultural factors as part of the social/human production, then the parameters of sustainable community and sustainable agricultural food community end up being based on the same key-factors. An example of this is illustrated by the following definition, subscribed by several authors,

A sustainable community is one that has a long-term capacity to regenerate itself socially and economically, and that has the capacity of reproducing itself and being economically, socially, culturally and ecologically involved (Scott, Park et al. 2000; Kline 1995, Cit. Mirata 2005, 3).

This definition can be contested by the concept presented by Allen, which introduces a significant change in the sustainable agricultural food scenario. This author defines a de-codifying matrix of the sustainable agricultural food community, designated by the 3 E’s: “environmental, economic and equity” (Allen 2004, 82). This definition introduces a subtle interpretation of equity, i.e., in this specific food context, the values of justice are emphasised as a means of structuring the social dimension. For Sonnino (2007), *equity and justice,* are the key principles for sustainable development, in the sense that it attempts to meet the basic needs of all human beings while also acknowledging the potential for imposing cost onto future generations. In the agro-food system, this idea of justice refers to the social relations, which involve production and food consumption. This means that, in the scope of food production, social sustainability can be an equation in two ways: (Mulier, pg. 5) one, by including internal factors inside the agricultural community; and the other, by including external factors. Internal factors comprise workers’ rights and treatment of animals in the farm. External factors refer to the benefits that these production units can bring to the surrounding community, by being an opportunity and support to individual farming structures (Gips, 1988, Cit. Allen 2004, 86).

The idea of justice can also be interpreted as a principle of solidarity. The communities which are external to the agricultural community express solidarity. They support the latter by means of conscious consumption and knowledge of the above-mentioned social conditions.

To sum up, the quality of the social environment is determining for sustainable food

production and consumption. However, this aspect cannot be understood externally to the wide economic context. This means that social and economic structures of the agricultural food system, undoubtedly, affect the environment's quality. In a general way, we can say that the interaction between the wide social, economic, environmental and cultural systems, in which the agricultural food system is inserted, influence agricultural production, its distribution and consumption. In more restricted terms, agro-food sustainability system will be possible within a balanced perspective, which can be achieved through understanding the community, where the connection and support amongst members will be the fundamental factor to its operation.

Designations for a sustainable food system

Sustainable food(…) refers to food which matches a number of criteria, including: Proximity(…); Healthy(…); Fairly or co-operatively traded(…); Non-exploiting(…); Environmentally beneficial(…); Accessible(…); High animal welfare standards(…); Socially inclusive(…); Encouraging knowledge and understanding(…)(Sustainweb 2002, 2).

Throughout the times, there have been several definitions to the concept of unconventional agricultural food system. Many of them correspond to diversified trends in the scope of the sustainable agricultural food system; others emerge in the midst of more specific areas of knowledge. The most meaningful terminology is:

_community food security (Anderson and Cook 1999; 2000; Pelletier et al. 2000; Bellows and Hamm 2003, Cit. Feagan 2007, 24);

_alternative food regimes (Friedmann, Cit. Allen 2004, 64);

_alternative food systems (Gottlieb and Fisher, Cit. Allen 2004, 64);

_integrated food system (Clancy, Cit. Allen 2004, 64);

_alternative food streams (Grey, Cit. Allen 2004, 65);

_alternative food networks (Marsden, Cit. Allen 2004, 65);

_alternative geography of food (Whatmore and Thorne, Cit. Allen 2004, 65);

_alternative agro-food networks and systems (Goodman 2003; Watts et al. 2005, Cit. Feagan 2007, 24); alternative or shortened food chains (Rending et al. 2003; llbery and May, 2005, Cit. Feagan 2007, 24);

_the 'quality turn' (Llbery and Kneafsey 1998; Morris and Young 2000; Goodman 2003, Cit. Feagan 2007, 24);

_local food systems (Herderson, Cit. Allen 2004, 64; Feenstra 1997, Henderson 1998, Lacy 2000; Hunrichs 2003, Cit. Feagan 2007, 24; Feagan 2007, 24; Pretty 2001, 1).

Our interpretation perspective of the sustainable food system is one of linking the several areas of knowledge, providing a global vision of it. Therefore, we interpret the food system as a whole, as a system composed by an intricate set of networks, in which some levels of relationship gather, simultaneously, establishing several types of connections. In other words, the idea of food sustainability carries a multidisciplinary vision of the problems that are inherent to the production of food goods and their consumption.

We foresee a planetary vision, where the main point is the quality of human life. This

humanitarian perspective of the food system presupposes co-operation from Man to Nature. This co-operation can become effective through mechanisms that may contribute to the construction of a close relationship between urban and rural communities, between the field and the city.

The building of a food system based on this idea of physical proximity, matches in every way with the presuppositions of sustainable development, in which the resolution of problems begins by spotting them, adding value to local economy and territorial landscape, empowering social interaction. The nearness concept connotes the re-locating of food consumption to a limited geographical area, through social interaction; in which, producers and consumers have a face.

Therefore, a sustainable food perspective presupposes a shortening of the food chain. This means that the smaller the distance is between "from the fields to the table", the bigger the degree of food sustainability. Ultimately, we can say that direct trade between producers and consumers provides the shortest circle, which can be established.

In this sense, we adhere to the denomination of *local food system* to define sustainable food system. This terminology carries a dimension of nearness and the concept of system. Proximity is inserted within the perspective of local sustainable development. The notion of *food system* includes all the aspects related to food production phases, distribution, consumption and food waste.

The roots of change

(Founders agriculture working group 2001, Cit. Pinderhughes 2004, 187)

Organic farming[2]

Organic agriculture is a holistic production management system, which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices, preferentially to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system (FAO/ WHO Codex Alimentarius Commission 1999, Cit. King, 2006, 3).

The principles and techniques of organic agriculture promote an improvement in human, animal and environmental health and establish a relation of respect for the planet.

Organic agriculture is based on ethical principles and brings about harmony between Man and Nature. Human beings are a part of this natural environment and they should be co-operative with Nature, and not compete with it. Organic agriculture systems produce food items, similarly to natural eco-systems (Quinta da Serradinha 2008), considering the farm as a whole-farm system. The organic farm emphasizes multidiscipline and often develops specific research approaches

[2] Organic agriculture also known as "agricultura biológica" in Portugal, as well as, in Italy "agricoltura biologica", "agricultura orgânica" in Brazil and "ecologic agriculture", in Spain and Denmark, or "natural agriculture" in Japan.

(Allen, 2006, pg. 39).

At an environmental level, the advantages of organic agriculture are of several types. Within the scope of ecological practices, we highlight *bio-dynamics* and *permaculture*, because they incorporate the concept of a complete life cycle in a more effective manner, using renewable energy sources, as far as possible, thus, reducing the dependence on external energetic sources. This way, organic agriculture saves an average of 30 per cent of fossil fuel, when compared to the conventional agricultural system (Steffen 2006, 52). In a general way, it also reduces the quantity of inputs.

This type of agriculture does not use chemicals in food, nor does it use pesticides, antibiotics, or genetically modified food. Organic agriculture harvests using *green compounds*, organic compounds to fertilize the soil, adding nutritive and mineral substances, which preserve the humus. These techniques enable the improvement of the soil, avoiding its exhaustion. Additionally, while practising the principle of seed rotation, organic agriculture contributes to the production of a richer soil, caring for its health, maintaining biodiversity and the capacity of retention of a bigger quantity of water. Last, but not least, because this type of agriculture does not use chemicals, it helps preserve the quality of drinkable water.

Organic practices improve animal quality of life, thus, contributing to a healthier food chain. They promote biodiversity in roughly 30 per cent, as opposed to conventional agriculture, which invests on "specialization and mono-culture as essential to efficiency and productivity" (Allen 2006, 37). In organic agriculture, pest control is done through encouraging predatory insects.

The beneficial action of organic agriculture is extended to the preservation of gastronomic culture and protection of landscape, promoting the variety of plants that are produced in syntony with productive systems, adapted to the diversified locations. Understanding the natural world implies harvesting within seasonal rules, which means production and consumption of fresh products that are produced and preserved in a natural way.

The development of organic agriculture makes up for a scenario of food quality, where the final consumer of any agro-food system contributes to the planet's health and, ultimately, eats better, when preferring products that originate from organic agriculture[3].

Biodiversity

In conventional agriculture, the alternative to the process of specialisation has been promoted by organic agriculture and by several other initiatives that promote food biodiversity, such as, the Slow Food and Nayakrishi Movements (Mander 2006, 22), and many other organizations that dedicate themselves to the preservation of seeds through the production of deposits.

[3] Products of organic agriculture contain a "bigger quantity of dry matter, minerals and vitamins. On average, organic products contain more Magnesium (29.3%), Vitamin C (27%) Iron (21%), Phosphorus (13.6%), Calcium (26%), Copper (11%), Manganese (42%) Potassium (9%) and 15 % less nitrates; their content is richer in fito-nutrients, such as Flavonoid, which have anti-oxidation, anti-cancerigenous effects and protect the cardiovascular system, amongst other effects in human health" (Agrobio 2006).

Organic agriculture increases biological diversity in several ways: firstly, through the type of production, which by itself is based on a wider diversification of plantations. Secondly, it protects regional and traditional productions. Finally, harvesting through organic techniques produces an increase in the amount of living organisms[4].

Lastly, the organizations of seed deposits have helped preserve traditional agriculture, by actively supporting farmers to promote diversity through the prevention of local varieties, guaranteeing abundance and the re-introduction of traditional culture seeds[5].

Sovereignty

The principle of self-sufficiency is based on the creation of a food community that can supply itself without needing to import, i.e., a community that knows to manage its food resources within its regional or national geographical boundaries "as a people's right to decide about its own agricultural and food policy" (Social justice and human rights network 2008). The application of this principle implies a macro vision of sustainable community.

All local, national and regional entities and communities have the inherent right and obligation to protect, sustain and support all necessary conditions to encourage production of sufficient healthy food in a way that preserves the land, water and ecological integrity of the place, respects and supports producer's livelihoods, and is accessible to all people (Mander 2006, 12).

This concept is widely promoted by Vanada Shiva, in defence of the farmers of the southern part of the planet; it is one of the leading policies of the *Via Campesina*, an international movement that co-ordinates organizations of small and medium farmers. The idea of sovereignty is also practised by the Japanese food consumption cooperative: the *Seikatsu Club*.

The principle of food sovereignty promotes the national local consumption, only resorting to the supply of imported products when a certain food variety does not exist in the country. This attitude protects local farmers, their economy and food culture.

Fair trade

The concept of *fair trade*[6] is applied to food products for consumption, imported from long distances, especially from southern countries. The *fair trade* initiative is particularly important to food goods that do not exist in the North of Europe, which have long been introduced in our food system. Initially, such products were coffee, tea, cocoa, and banana. Presently, a lot more food

[4] Around 30 per cent in the number of species and 50 per cent (King, 2006, pg. 4), when compared to conventional agriculture.

[5] It's the case of the Bangladeshi Nayakrishi movement, which has supported around 100.000 farmers in the sense of re-taking organic methods and implementing traditional crops in their areas, using the slogan *freedom zone* (Mander 2006, 22).

[6] Translated into Portuguese as *comércio justo* and into Italian as *mercato equo-solidale.* The *fair trade* movement began in Europe, in the 80's, and it has been supported by 47 countries (Mander 2006, 23).

goods are included in this basket of importation, coming from distant countries. The *fair trade* label defends dignity in what concerns working conditions of workers from far-off agricultural plantations; it promotes the right price, without exploiting those who produce it. The initiatives carried out by this movement are meritorious for implementing this principle of social justice, acting as a means of commercial support.

The promotion of this concept, supported by several associations and institutions that are exclusively dedicated to the activity, and the acknowledgement of its values, by the general public, have enabled the expansion of the concept into the short food chain. Herein, the focus is on social development at local and regional levels, with quality, justice and solidarity towards the rural community.

The *fair trade* symbol seeks to alert consumers to the issues of solidarity and respect for agricultural work. The *fair trade* label sensitizes consumers and makes up for a consumption alternative. While shortening the distance between producing and consuming communities, they make the system of agro-food consumption fairer and more transparent.

From the consumer's part, the acknowledgement of this movement can make consumption become more conscious, both in terms of importation of long distance products, and trade of local food products.

Food links

(F3 2000, 22)

Promotion of the simple concept of link, between consumer and producer, as the starting point for a more sustainable food economy (Local Food and Sustainable Development 2000, 6).

The proximity between producers and consumers promotes a relation between those who harvest and those who eat. The interconnection between these two extremes of the food chain enables the creation of a healthier system at the social and environmental levels and, particularly, it improves food quality.

The establishment of direct contact increases the degree of dependence, through the paving of efficient co-operation ties, thus, contributing to social and agro-food balance. The mutual support, the trust relation and the values of transparency that are built between the intervening parties, enable the increase and re-qualification of quality of life.

The initiatives, which are based on this close relation, make communication easier. This direct contact enables the obtaining of a quick feedback from the system, the perception of satisfaction or dissatisfaction of its partners, thus, allowing the introduction of changes that may improve the system of distribution and consumption.

"From the fields to the table" helps to adjust demand to supply, especially when agreements for supply are established between producers and consumers. On the one hand, this

close relation benefits the consumers, who can gain access to a continuous quality food system; on the other hand, the producers, who sell their products and see them valued.

Participation model

Under the perspective of the agro-ecology movement, participation is a key topic. It means the possibility of the consuming community - external to the rural community -, getting involved in issues of agricultural production. This participation moves towards a system, where the consumers support and improve rural communities, thus, helping to preserve their cultural identity. Participation through the mechanism of sharing information and experimenting becomes fundamental to encourage knowledge and understanding of the cultural food system.

Capra (2005, pg. 20) adds that direct participation in agricultural activity allows the learning of sustainability values.

Buy local

The improvement of individual and public food health depends on the easiness of access to organic products of local production. The enhancement of local food can bring about economic, environmental, nutritional and social benefits.

The access of local food farmers allows the consumption of seasonal products and a great amount of fresh products, with higher levels of nutrients, as opposed to industrially processed food items.

In environmental terms, the consumption of local products minimises food transportation costs and can contribute to the reduction of packaging. Finally, local food trade implies a smaller emission of carbon dioxide onto the atmosphere, thus, improving the quality of the air.

The fundamental consequence of access to local and organic products will be the change in food consumption behaviours.

Plugging the leaks
(F3 2000, 12)

Plugging the leaks refers to the retention of money within the local area. The promotion of local economy can be stimulated through the structuring of a local consumption network, specially, by developing direct systems of consumption between producers and consumers. This network of local and direct consumption networks retains the circulation of money and promotes the creation, or maintenance, of jobs and gives dynamics to local economic development. Keeping the money on a certain territory represents its bigger circulation in that area, whereas consumption through the international food circuit contributes to the production of much less wealth in the local scope[7].

[7] This situation can be illustrated with the Cornwall case (Plugging the Leaks), which compares the result of buying locally originated food and

Apart from developing the local economy, a network of local and direct consumption, brings economic advantages to producers and consumers. A system of direct consumption eliminates the need for intermediate agents. The suppression of the *middleman*, such as freight operators, processors, packaging companies and retailers (Vijoen 2005, 45), means paying a fairer price for food. This type of trade also minimises the cost of transportation, which is also part of the final price that consumers pay for food. It also reduces the environmental cost.

In the social scope, the relation of proximity between producers and consumers favours agricultural stability, this being a particularly important factor for small farmers, thus, promoting dignified working conditions and incomes.

Local landscape

The local landscape suggests the widening of the boundaries of urban perimeter of cities, including their *greenbelt*. Therefore, taking cities 'embedded' in their own *hinterland* into account brings environmental, landscape-related, educational and nutritional benefits. In strategic terms - bearing ecological and economical concerns in mind -, the inclusion of the city in its *greenbelt* can satisfy some of the food needs of urban areas, namely, at the level of fresh products.

Concerning the sustainable food system, from the environmental quality viewpoint, there are good examples of harmony between the city and the countryside, as is the case of Adelaide[8]. It recycles its residual water to supply it to the agriculture in the periphery of the city. It is also the case of Bristol[9], which recycles sewage, transforming it into soil conditioner and fertiliser.

The widening of the city's urban perimeter boundaries to its surroundings, being an integral part of it, can provide for a better relation between the urban area and the countryside. In the peripheral space of the city, named *greenbelt*, leisure activities to benefit from the green areas can be stimulated. Urban population is further and further away from the rural universe, both at a physical level and that of memoir of the countryside. This interconnection of urban spaces with rural ones, provide a gathering between cultivation and food harvesting. Nowadays, there is a growing demand for these green spaces from the urban citizens, thus, materialising this proximity in several ways. In this type of interaction, we highlight pick your own, "le agriculture hobbistiche – in particolare frutteti e alevamenti – le fattorie pedagogiche" (Donadieu 2006, 58).

buying in supermarkets: "every £1 spent in a local organic box scheme generates a £ 2.58 for local economy, compared to just £ 1,40 each £1 spent in the supermarket".

[8] In this Australian city, tens of thousands of hectares of land on the edge of the city are cultivated using the city's wastewater for irrigation, growing vegetables, as well as, grapes and fruit. There is some concern about trace quantities of heavy metals that could accumulate in the soil, but it would take decades to cause any problem. Adelaide's wastewater crop irrigation system is regarded as one of the great success stories of urban agriculture (Viljoen 2005, 38).

[9] Another case illustrated by the same author is that of Bristol, Wessex. Water has developed its own system for turning sewage into a soil conditioner and fertiliser. It dries the city's entire sewage output and turns it into small pellets called Biogran, which are then sold to farmers and land reclamation companies. Again, trace amounts of heavy metals have been quoted as problematic. But this is becoming less of a problem, because cars no longer run on leaded fuels in the UK, and in Bristol, de-industrialisation has led to a great improvement in the quality of Bristol's sewage sludge (Viljoen 2005, 38).

In this context, the preservation of local landscape makes a lot of sense, as Viljoen (2005, 35) refers. This author notices that some cities of Italy and France still have a very strong relationship with their immediate *hinterland*, with *peri-urban* agriculture still much in evidence. This is the case of Florence, which is still surrounded by orange and olive groves, vineyards and wheat fields, where a large portion of its food requirements are grown.

Conclusion: Food network dimensions

We can define food networks as the (physical or virtual) links between different types of actors, that exist for the purpose of carrying out activities associated with the production/ exchange of food, and the development of food related knowledge (Meroni 2006, 52).

Food sustainability involves the creation of a network of systems that promote interpersonal relationships and the shortening of distance between individuals.

This network has a global dimension, in a macro vision of the understanding of sustainability principles, and has the merit of gathering people around fundamental values, enforced by a relation of communication, support and syntony, in what concerns food system problems.

The web unites several communities, using technological instruments to develop connection. These relationships create a circle of influence to the social and environmental issues of organic and regional agriculture. In the scope of agro-food, there are several examples of this type of networks. Due to their dimension and international reputation, they are often named movements, such as the Via Campesina, Urgenci and Slow Food[10].

The micro dimension network acts locally, valuing the economy, the social relations, the food goods produced within, the environment and local landscape. Therefore, this local vision, promote systems a community of food bases on the participation model, considering within the proximity between the intervening food partners: farmers and consumers.

Most principles of sustainability are based on the relation of proximity, through the development of local actions. The development of local consumption and the concept of food community, involve the construction of relationships amongst producers, between producers and consumers, and amongst consumers. This network of relationships can be the key to food sustainability, based on a solid food community, where there is trust, interdependence and promotion of mutual comprehension. It should also feature good communication amongst individuals, co-operation towards nature and provide environmental and nutritional, cultural, economic and social dividends, based on the proximity network.

[10] The Slow Food movement and its 80.000 members, distributed through 45 countries, has been protecting the diversity of species, thus, promoting a renewal of interest for local and regional specialities (Mander 2006, 22).

To conclude, a healthy food community can work, if it is aware of itself and its role in economic and environmental development. Maintenance and spreading of the food community is based on education and participation, thus, stimulating knowledge of food sustainability principles.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Ethically Sound Innovations

The phenomenology and taste of the outdoor elites

Minna Uotila[1], Piia Rytilahti[2]

Abstract

In recent discussion, an ethical attitude towards designing, engineering and consuming has been associated with an alternative and 'socially oriented' – even socio-critical or antisocial – logic of marketing and consuming. Such an attitude could easily be seen as opposite to that of quarterly economics and the principles of economical effectiveness. Yet, the new consumer elite, i.e. the emerging ethically sound elite of Western society, might well consist of diverse groups of well-off and socially aware individuals. The aim of this paper is to illustrate how the study of communities of connoisseurs opens up possibilities for ethically and ecologically sound innovations in which both the exchange value and the unique value of a product are designed into its life cycle.

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1. Introduction

‘Average is not enough’ (Male climber)

Alongside the mainstream conceps of ethical design, (sustainable) responsible design (Cooper 2005; Sethia 2005), sustainable or eco-design (Tukker et al. 2001; Mathieux et al. 2001; Beard and Hartmann 1997; Holdway, Walker and Hilton 2002) and ethical marketing or management of ethics (Madsen 2005), one can see the breakthrough of high-design products and services. While these have added value and may even be considered luxury items, the associated production and marketing practices are ethically highly constructed on all levels of business. In the vision of the present study, the long-term success of business may arise from the ethically aware and wealthy sectors of consuming society, sectors comprising market groups and social classes that neither need nor desire to accept anything that is designed, produced or marketed unethically. An approach of ‘learning to generate more with less’ makes it possible to design and produce ethically high-oriented products and create successful brands that carry the idea of environmentally sound design. Within the vision of the two research projects (Sumac and Emergence of Luxury) referred to in this paper, the green industrial revolution needs to take into account both old and new ethics of consumption (Rytilahti, Uotila and Narbrough 2007).

Very little research has been done in the area of high-quality or luxurious products from the point of view of sustainability. The traditional conception of ‘old sparkling luxury’ has become embedded in our attitudes and social structure at the expense of the more sustainable aspects of new luxury. The new luxury emphasises the high quality, durability, and reparability of products (Danziger 2005; Reinmoeller 2002; Uotila, Falin and Aula 2005; Kirig and Wenzel 2005). A shift to the principles of sustainability, i.e. dematerialisation, products becoming services, and recycling (JPC 2005), can be promoted by the meaningful immaterial, emotional and linking values of the new luxury (Cova 1997; Rytilahti 2008). The immaterial values of a product are present after the product has passed its commodity phase (Lehtonen 2008, 98-99; Appadurai 1986, 13-15).

The fundamental and overall theoretical perspective chosen for the proposed project views the phenomenon of ethically sound consumption and design in the light of Karl Popper’s thinking. In his theory of three worlds, Popper distinguishes natural objects as part of World 1, subjective awareness as an aspect of World 2, and cultural products, events and social institutions as manifestations of World 3 (Popper & Eccles 1977). On this theoretical basis, ethically sound innovations could be defined as:

- products and services -- objects of World 1
- designers’, producers’ or consumers’ experiences of ethically sound products, services and their productions -- objects of World 2
- culturally shared understanding or collaboratively produced knowledge of such products -- objects of World 3.

The study views responsible design as mainly associated with subjective experiences and the senses, a choice of theoretical perspective that links the research to the qualitative tradition. Against this theoretical backdrop, the paper goes on to investigate empirically the experiences of precursor users and users as innovators of in the Finnish and the Scottish contexts. The paper also presents a heuristic scenario and a concept with ethical added value for the sport business in particular.

2. Research context and methodology

The aim of the article is to describe the underpinnings of the research on outdoor sports conducted from a sustainable and ethical point of view as part of the project 'Sustainable Innovative Materials in High-Tech Applications' (Sumac). This ongoing project, funded by the Academy of Finland (grant no. 117845), has provided the research data, heuristic scenarios and concepts to be described below. The scenarios and concepts were elaborated in a workshop arranged for students working on their master's thesis on clothing and in a course of product design for first year students in design. The purpose of the scenarios was not to produce a detailed description of a particular sport product but to facilitate the creation of visions for an iterative product design process by engaging students of design in user experiences (see Keinonen and Jääskö 2004).

The research on outdoor sport cultures referred to in the paper goes back to 2004 and was completed as part of the project Emergence of Luxury, also funded by the Academy of Finland (grant no. 205608). The linkage between the two projects lies in the vision that ethical design will act as a driver of sustainable economic development, which will arise through environmentally and ethically aware consumer groups. The two research projects have also provided empirical material that allows us to better illustrate and examine cultural diversity in ethically sound design and innovations.

The research design used in this study draws on and develops the perspectives that have evolved in our previous studies on experiences in the area of sport and leisure (Uotila, Falin and Aula 2005; Uotila et. al. 2005). Data collection in the Finnish and Scottish contexts was conducted in the Sumac project through documentary videos and group interviews during spring 2007 and autumn 2008. The first qualitative case study was carried out during Easter 2007. It is a video documentary of a three-day skiing trek undertaken by six outdoor enthusiasts (n=6) in northernmost Finland; the documentary was produced by the group itself. The informants were advised how to use the camera and what kind of documentation might be relevant for our research purposes. All the practical decisions, such as when to shoot footage and how, were left to be made by the informants in real time, in keeping with the egocentric video method used by Bidwell and Browning (2006). This pilot study was based on the idea of lead-user communities as innovators (von Hippel 2005). The outdoor enthusiasts often represent Pro-Am culture (Leadbeater and Miller 2004), i.e. people whose skills, knowledge and know-how reach – and even exceed – professional standards.

The Sumac project has focused on the target groups' experiences of sustainability in sport and high-quality design products, as very little research has been done in this area. The collection of the qualitative end-user data has been guided by merging the traditional target groups of sustainability research and the new diverse segments of end-users. The audiovisual end-user data was augmented by self-reflective group interviews. The qualitative data-gathering methods used in the pilot study have since been applied with the other focus groups. The informants consisted of women and men who regularly engage in summer and winter outdoor sports. The sample participating in the video documentary consisted of eight ski trekkers, six snowboarders, four snow surfers, eight climbers, four canoeists, and four downhill bikers. With the exception of European climbers involved in the Scottish trek, the groups studied were Finnish enthusiasts engaged in their sport in Finland. They informants were selected using the 'snowballing' technique, that is a method for expanding a sample by asking one participant to recommend others for interviewing (Groenewald 2004, 3).

The self-reflective interviews were semi-structured and focused on the individuals' relationships to their sport as well as their opinions and preferences regarding sport products and services from the point of view of sustainability. The decision to study individuals representing a number of different sport and leisure activities was an attempt to avoid findings that might be specific to a single activity group rather than attributable to the outdoor sport experience more broadly.

The directions given to end-users for videotaping their sport activities advised them to focus on their departure and return, as well as their preparations for the trip, including packing and unpacking. In addition, they were asked to videotape pit stops, lunch breaks, gear maintenance, highlights, events and unexpected situations during the trek. The semi-structured group interviews, which varied in duration between 1 ½ -2 ½ hours, had themes but also gave the participants an opportunity to reflect on the video. Four major themes were used: the personal significance of the sport; the equipment and physical environment; the life cycle and ecology of the equipment; and the social activity associated with the sport.

The video documentaries and interviews were conducted using the focus group method, which has been found to be fruitful in research designs concerned with user experience (Kuniavsky 2003). According to Kuniavsky, at its best the focus group method can be expected to yield knowledge of what the participants think about a given subject, how they think about it, what they value most about it, and why. The main purpose of focus group discussions is not for the participants to produce a single meaning but to share experiences from which multiple meanings can be extracted (Finn, Elliot-White and Walton 2000).

Not all members of the groups documented in the video were able to join in the interview. The number of interviewees is currently 27. Data on two or three summer sport groups will be added, increasing the total number of groups from seven to ten. With the exception of two groups, the age of the informants fell in the range 25-39 years; one of these two groups consisted of women under the age of twenty, whereas the members of the other were over forty. Overall, the groups had more men than women, with eighteen male and nine female interviewees.

The data have been initially analysed inductively with the help of Atlas-Ti qualitative analysis software. The analysis applied grounded theory (Glaeser and Strauss 1967), a procedure in which data are conceptualised and built into an explanatory theory. The unit of analysis was the self-contained description – a narrative told as part of the interview, not an individual sentence or idea (Sheller and Kunz 1998). The goal of the analysis was not to concentrate on particular product characteristics that define sustainable materials and ethical products but instead to highlight the sport experiences and pleasure involved in using ethically sound products.

The first phase of the analysis consisted of open coding of the transcribed interview material and the determination of the categories. These categories were studied as themes that might be relevant in understanding the phenomenon of sustainable consumption. The main categories that emerged from the data during the first round of analysis were sport commodities, unique products, disposal of products, brands and taste. In what follows, the paper organises these initial findings in terms of the Popperian world-view and explicates the values related to ethically sound consumption.

According to Morse (2007, 234-235), data collection and analysis cannot be separated in the grounded theory approach, and sampling schemes change dynamically with the development of the research. Sampling in qualitative inquiry must be purposeful, with participants invited into the study according to their knowledge about the topic being researched (ibid.). In the Sumac project, the qualitative sampling proceeds from purposeful sampling to theoretical sampling along with the data analysis (Strauss & Corbin 1998, 201). For example, it draws on interviews carried out among other skill cultures such as Finnish women's civic organisations (the Martha Organization) from the point of view dematerialisation and recycling used in everyday home economics.

The phenomenological approach seeks to understand things as they are encountered in their context. In this study, phenomenology is applied as a method rather than as a form of analysis. The aim is to attain valid knowledge of the phenomenal subjective experience and to this end the tacit knowledge of connoisseurship is most successfully contemplated through phenomenological interpretation (Anttila 2005, 332; Routio 2000). The phenomenological method and initial phenomenological analysis are situated in Popperian World 2, as subjective experience of the sport.

3. The three worlds of ethically sound innovation

One of the goals of the Sumac project is to elaborate product life cycle thinking and innovative proactive design for sustainability. The present paper does not aim to present extensive results to this end but rather offers a tentative perspective on sustainable and ethical experience as these pertain to products. An initial analysis of the end-user data collected during the research project has revealed three distinct themes: data that deal with the product itself, labelled 'ethically sound product'; data that deal with experience, labelled 'experience of ethicality'; and data that provide insights into what may be termed the 'contexts of ethicality'. One particular focus of the research has been to determine what it is that groups engaged in different outdoor sports conceive of as ethical and what commodities these groups value as high-technology and ethical products. Although the results to be presented are still tentative, the following examples, as well as the scenario and concept, may inform further analysis by illustrating the essential properties of sustainability and ethicality in outdoor sport contexts. The examples are given in the order of the properties characteristic of Popperian World 1, World 2, and World 3. The following sections outline some of the central elements of ethical products (W1), ethical experience (W2), and the context of ethicality (W3).

According to Lehtonen (2008, 85), one problem with the research on consumption is that it bypasses the material aspects of products, although it is claimed that modern life and societies are the most materialistic in history. There are at least three reasons for this tunnel vision. Firstly, the prevailing economic thinking steers people towards defining products as mere instruments in a business transaction. Secondly, the new mind-sets of sustainability and ethical consumption (Beard & Hartmann 1997) are inhibited by methodologies: prices and purchase decisions are more straightforward to study than multiform and transient interaction with products. Thirdly, there is a strong tradition of studying the meanings of products as signs or reflections of something 'more real' (Lehtonen 2008, 86). One prospect presented in this paper is to contemplate a given product in both the commodity phase and the unique phase of its life cycle from the point of view design research.

World 1 – ethical consumption as physical objects

According to our informants, there was not an abundance of sustainable high-quality high-technology sport products. With regard to gear, one of the interviewees knew *'for a fact that not a single one of my garments is made of recyclable materials'*. The weather and other conditions put a great strain on sport gear and clothing, and hence the performance of the material and the product are the fundamental attributes that a product must have. High-tech performance of a product was not easily seen as a sustainable solution, because technological development is fast and innovations are introduced every season. Moreover, the integration of high tech and textiles still lacks one essential feature: it is not easy to wash high-tech sport clothing in a washing machine (Mattila 2006,1).

The end-users seemed to be demanding and criticised the supply on the market. For instance, one climber, who has been involved in all kinds of mountain sports, including mountain biking and snowboarding, described the sport gear as follows: *'usually the stuff is crap, it is just fashion'.* For the skilful enthusiast *'average is not enough'*. This the reason why Pro-Ams create innovations by themselves: '*There are no pros. There is no professional service. But a lot of people work things up themselves, lots of people, creating the solution they find best. Many criticise what the manufacturers put out, they think they can make better gear. Then they put some of their drawings on the net showing how something should be done and put together pretty good things, too'.*

Categories of inorganic and organic materials came out in the group discussions with the end-users. From the point of view of sustainability and ethicality, inorganic materials were seen as high-technology solutions, some of which worked, some of which did not. The end-users were

active and innovative in repairing gear: worn-out trousers used in climbing were repaired in a traditional way with a needle and thread, or more quickly with glue before the day of the climb. Some of the enthusiasts collected durable high-tech materials from their worn-out trousers or jackets and used the leather or thick nylon as a patch to repair their gloves or rucksacks. It is also a functional way of making customised products when you know what materials to add where they are particularly needed: *'Parachute material… I was thinking that sure it can be recycled just like they try to do with everything else – melt it down and so forth. But then I thought that you could make equipment bags or backpacks out of it or something else. You could make Ozone trousers, with a brand label in the back'.*

Not all of the enthusiasts had the time or took the effort to patch up broken gear. When asked about more sustainable solutions in the sport commodity sector, recycling and swap shops were the most common solutions offered by the informants. The secondhandedness (Hetherington 2004) of sport products reflects the consumer ethics: *'I sell a lot of things when they still have life in them'.*

Recycling was excluded more often in the case of high-tech materials that are difficult to repair or recycle. The smaller and cheaper commodities were easier to replace with new ones. By contrast, the more expensive and more technical investments had a 'garage storage value'; as a Finnish male kite surfer put it: *'Their value drops a lot of course, that's the way it is. Their value drops quite a lot otherwise, but it doesn't happen any more to those when they start getting like tissue paper, the material. I don't know where these go? On top of the wood pile... I haven't seen that graveyard'.*

According to Kronenberg (2006, 562), the viewpoint for more sustainable and ethical consumption is to pilot the future where customers are educated about and able to count on the advantages of using better quality products, ones that are more expensive but whose performance and durability are higher. This is illustrated in the next excerpt: *'Do you know Hilleberg, the Swedish tent producer… their tent was absolutely perfect, except this part [points to a tear in the tent] and I sent it back with instructions on what they should do with it, and they did it and send it back to me'.*

Hetherington (2004) has studied the meaning of the disposal of products from the point of view of consumption. He claims that the essence of consumption lies not only in the acquisition, purchasing and owning of the product. The abandoning of a product has just as much meaning for the consumer, but it has not been explored through consumption research. When studying connoisseurs and their enthusiasm for sports, it is very clear that the investment of money, social effort and time in the sport is high. The more money one has put into a piece of equipment needed for a hobby and the more time and skill are involved in learning how to use the equipment, the harder it is to stop owning it even when it is not being used anymore.

World 2 – subjective experiences of ethical consumption

Connoisseurs, i.e. amateurs (Hennion 2007), have a spiritual enthusiasm for the thing they do. This has been the phenomenological starting point in defining the context of the subjective experience of the end-users in sports. The groups have a meaningful relationship with the sport products they use because of the emotionally meaningful leisure context. One of our interviewees summed up the meaning of the hobby: *'You forget everyday worries and the stress from work when you have to spend every minute on surviving'*. Self-fulfilment and pushing one's physical limits create emotions stored in the body, which remain as a unique experiences – 'top kicks' –as depicted in the next excerpt: *'Sport is for fun – you want to reach a great five or great six…it's the level of fear you want to be at'.*

Typical for Pro-Ams and lead-users is that they in one way or another channel their devotion into a business that they can make a living from. That is one rason why the sport products are critically evaluated by these enthusiasts. It also requires a lot of know-how to be able to

participate. Technology and technicality can be part of the sport, but, according to a kite boarder, they are not ends in themselves: *'Can I remark on the terms a bit? I was a bit confused when you asked before if this is a technical sport and I started thinking what the technical sports were. Like sailing, the equipment has incredible importance but skill is the only think that makes any difference. You can kite board even with a really bad kite – with nothing but some rope and a tarp – if you want. But, but without skills you can't really do anything. It is more of a skill sport than a technical one'.*

To end up as a real innovation, existing products must provide good or excellent performance. The role of high technology is to offer a means to survive in extreme conditions. This is why the use value of a sport product is questioned in these communities every time new technology is introduced. Innovations with the most potential are tested by the members and the information is spread by word of mouth or over the Internet. The products that have passed the critical evaluation of the community earn a unique value as symbols of a long-term investment in the life style. For the real enthusiasts the equipment is not just instrumental and stashed in a cupboard or garage when not used. Instead, these products are present in the daily life in home environment, as a female ski-trekker portrays: *'We haven't got a flat;, we have a storage area in which we live. On the bedroom ceiling we have a rack like you find in a garage with sledges, skis and things like that on it – everything is right there, ready to use… The sleeping bags on the wall are an important part of the decoration'.*

One interesting finding is that the enthusiasts were not only devoted to a specific sport. The interests of the focus group mixed with the neighbouring sports: climbers were engaged in other 'mountain sports', such as mountain biking and snowboarding. The kite boarders were familiar with sailing, so they already knew the importance of being able to observe and react to weather and wind conditions. This is where technology usually has its place. As a male kite boarder says: *'[technology] would overcome half of the forgetfulness.*

The purposes in gathering together as a sport group are both functional and social. It is not easy to keep up the standards of the sport by oneself. Figure 1 illustrates a narrative story, a scenario based on the video material and interviews in which the community of climbers are preparing the following day's sport activities. In this short piece, both the commodity and unique levels of content are present. With the help of this story-like depiction we can become aware of the subjective experience that can be attained through distinct time-related and spatial set-ups.

This is what Antoine Hennion (2007) calls a collective technique of taste. She suggests that post-modern tribes such as amateurs or enthusiasts do not believe things have taste. Rather, the analysis of these collective techniques helps to understand the emotional devotion to sensitise oneself to things, to other people as 'us', to situations and to moments. Taste is an opportunism of the moment and of the situation. It is an active way of a people putting themselves into a state where something may happen to them, as can be seen in Figure 1. There are other options for deciding one's taste than either determinism or spontaneity: connoisseurs insist more on attachment in people's activities, less on labels, says Hennion (2007).

World 3 – cultural constructions of ethical consumption

Who are the people that will make up the ethically aware and wealthy sectors of the consuming society in the future? When asked who the people are who will engage in these outdoor sports, the answers were such as: *'I don't know if you can confidently generalise, there are people who have lots of money, people who have very little money, people who are quite old, who have kids…people who sort of enjoy outdoor settings, educated people, ambitious people; it's really not a sport for underachievers I would think. Its quite common for climbing communities to be centred in university groups or clubs because it is quite difficult'.* This type could be identified with Florida's (2002) definition of the creative class or with Ray's and Andersson's (2000) classification of the cultural creative as the new ethically oriented elite of Western society.

A male climber sums up the ethicality of his enthusiasm on a more general level in relation to what might be termed 'conspicuous travel': *'A couple of friends of Sam's flew to the Alps in the winter to climb, for a single climb, one route... ultimately the hydrocarbons that are used for travelling from point A to point B or for the delivery of the products from the other side of the globe, or the recyclability of the single garment regularly used by the end-user do not have that much importance from the point of view ethical consumption'.*

The concept of taste usually goes together with the discussion of class and status. Luxury, elite, class and stratification are concepts with very negative connotations in excluding and categorising human beings in sociology. In this paper, we adopt a more positive perspective on taste as a subjectively experienced choice mediating between structure and action (Hildenbrand 2007, 540), as an interest in self-fulfilment and well-being instead of categories of social stratification. There is a kind of situational stratification that is perceived as positive instead of as envy at not being invited into some form of collaboration, action, or lifestyle (Collins 2004, 338).This is how taste emerged in a more positive way, as a climber advised somebody interested in taking up the hobby: *'You find communities of climbers in communities that are close to mountains… in general most climbing communities are very inclusive, I found, I've never felt excluded by a climbing community, you've just got to find them. Once you've found them you'll meet people, meet people, meet people….The tricky part is meeting the first people; it's really tough but once you have done that you meet people and they introduce other friends and, it snowballs, so to speak'.*

Lifestyles are not just individual lifestyles, but also rituals and thus markers of group boundaries (Collins 2004, 298). Social interaction produces both symbols and moralising about them. Fashion involves materialised commodities that have been created for their throwaway value. The sustainability of fashion emerges as retro fashion or the sign value of the classics. High technology can be used for the purposes of sport fashion. That is why, according to one climber, *'fashion is crap'* and unethical. The sport fashion product does not easily reach the unique level: *'climbers who take this seriously do not mind the look…but there are a lot of people who use the climbing gear as fashion accessories, they are outside the climbing community'.* For example, the group consisting of high school girls were fans of fashion and sport idols. They had adopted the latest trends in fashion and were familiar with the top brands and the colours of the season: *'It sure is pretty much equipment-oriented sport in principle. Textile sport … (laughter) especially in our case. We admire and look at what other people are wearing, saying it's 'way cool' and we have to get gear just like the top athletes have'.* Brands were important for these young ladies, as they have the novelty value of new commodities. The performance of the equipment was assessed by the brand.

Situations and events as cultural constructions of Popperian World 3 are also an essential part of the connoisseur cultures of outdoor sports. The future of the sport was seen as being linked to larger-scale social events where the values and knowledge of the sport could be transferred to an 'audience': *'I thought about gender because there are so few women involved and I have the idea that when they take up the sport it will bring in a anew perspective...it makes the sport sort of socially more acceptable in my opinion – it's not just a guy thing – the audience includes people's friends, they come there – it's not just wives. It's starting to become a spectator sport. There's something to see and people look for chances to watch it and stuff like it'*.

Cultural products, events and social situations can be a starting point for examining the bases of ethically sound innovations. Even though products do not have value, and the value emerges through the subjective experience of the user (Boztepe 2007, 59), the 'value', as Hetherington (2004, 169) points out, 'is the equivalent of a soul for an object'. The experience economy (Pine and Gilmore 1999) – in general terms the tourism industry – is advanced when it comes to in producing commodities that end up having the unique, i.e. experience, level of a product. Ethically sound innovations also emerge from the same type of enthusiasm and emotional energy (Collins 2004) as that seen in what people enjoy doing in their leisure time, especially in the outdoor context, which has been the focus of interest in this paper.

4. Conclusion

The material level of ethically sound innovations discussed in the paper through examples of sport products with physical and emotional experiences presents only a limited view of ethicality as a phenomenon. The analysis of the material objects of ethicality leads us to Popperian worlds 2 and 3 – experiences and contexts of ethicality – which highlight the nature of ethicality as a multidimensional phenomenon. The material level of the ethically sound innovations cannot be studied independently but must be examined alongside the immaterial level of the phenomenon.

The foremost ethically sound sport products mentioned in our video and interview data were related to commodities of conspicuous consumption, unique objects, disposable products, products that enthusiasts had available to them, brands and taste. The sport products interviewees own and actively use play only a partial role in their everyday lives. The data and tentative analyses indicate that ethically sound innovations are not just products made of re-usable materials, commoditised eco-brands or personal decisions not to consume conspicuously. Ethically sound innovation is based on values deriving from a holistic way of living and well-being, and in the future will be based on both the old and new ethics of consumption (Uotila 2007; Rytilahti, Uotila and Narbrough 2007).

We have focused on one way to outline the phenomenon of ethically sound innovation in the spirit of Karl Popper. Our thinking has led us to distinguish two paradigms of sustainability, which define the phenomenon on the level of form and content (Fig. 3.) The point of departure here was to distinguish the paradigm that defines ethical innovation from the point of view of the material use value of commodities (form) and the immaterial status value of unique and meaningful products (content). When a product is on its form level, it has a use value that is exchangeable in monetary terms. When a product is unique, it is meaningful to the end-user in a particular, subjectively experienced way. On the product's unique level, the end-user experiences the emotional and linking value of the object (Cova1997; Rytilahti 2008). The subjectively experienced uniqueness is studied phenomenologically in this paper: the experience of the product is linked with the material existence, i.e. the performance of the sport product and hence its use value. Again, the culturally shared understanding of products emerges from social interaction and is defined through the definition of taste.

On the level of content, the ethically sound innovations of World 1 are immaterial and more abstract: they are unique objects (W1), are experienced as being available (W2), and emerge as a taste (W3). The last term needs to be understood as a collective technique inside the community of connoisseurs. The taste of the outdoor elite is the outcome of the collective techniques that emerge among the groups of connoisseurs. There are collective techniques of managing equipment that combine both the commodity phases and the unique phases of the product's life cycle. We assert that the two parallel paradigms presented in Figure 3 exist equally and co-exist as parts of the phenomenon of ethically sound innovation.

The concept of uniqueness refers to the exceptional quality or customisation of the sport products. The unique immaterial values of a product are present after the product has passed its commodity phase (Lehtonen 2008, 98-99; Appadurai 1986, 13-15). From a sustainability point of view the product should have as many turns as possible from trade-in value to unique value and vice versa. In this sense the material and immaterial aspects of consumption are not concurrent; they alternate instead. The concept of 'availability' refers to the process of signification and could be compared to the term 'experience', which is a value-laden expression reflecting the subject's preferences and his or her personal world-view. The opposite concept on the level of form is disposal as a synonym of waste.

Hetherington (2004) suggests that in order to learn more about sustainable and ethical consumption we should also study how social life is created through disposal of the consumed material. In the literature, disposal is suggesting a too final, singular act of closure, one that does not occur in practice. Getting rid of something is never simply an act of waste disposal. The focus of the rituals of disposal is not only the discarded item but also its value. Accordingly, we have a

two-stage ‘holding’ process through which consumer objects pass before becoming waste. The bookcase, the recycle bin on a computer, the garage, the fridge, the wardrobe, are often constituted more as sites of first burial rather than of second burial. The gap is the space where things are held in a state denying their wastage – where they are kept available to us for a second time so that we can reconcile ourselves with the remaining value. This is also a question of identity: we are not just ‘what we buy’ but also ‘what we do not throw out’. (Hetherington 2004, 169-170.)

The utility of absence is as much a part of the communicative and ordering activity associated with consumption as it is a part of acquisition and use of some object or service as a mark of social membership (ibid.). In Figure 2 , ‘A rotating drum container’ concept created for pack a ski sledge tells us something about this post-modern emphasis on the need for ordering activities, a means of ‘successful doorkeeping’ and that is closely related to the act of disposal. It can be an individual practice, but also a social practice of managing the absence of personal products. There are plenty of situations in domestic and leisure contexts where the ‘absent presence’ – as Hetherington (2004) calls it – could be designed-in in a more socially sustainable and then in a more ethically sound way.

Christensen (2008) poses a central question to be answered if we are to ascertain the nature of ethical consumption: Why is our culture so ready to see sustainability only as an economic-cum-engineering issue? In order to find sustainability and ethically sound innovations, we need a deeper understanding of the kind of deep emotional platform on which products and services will acquire their added value in the future.

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Fig. 1: A narrative scenario of the community of climbers preparing the following day's sport activities.

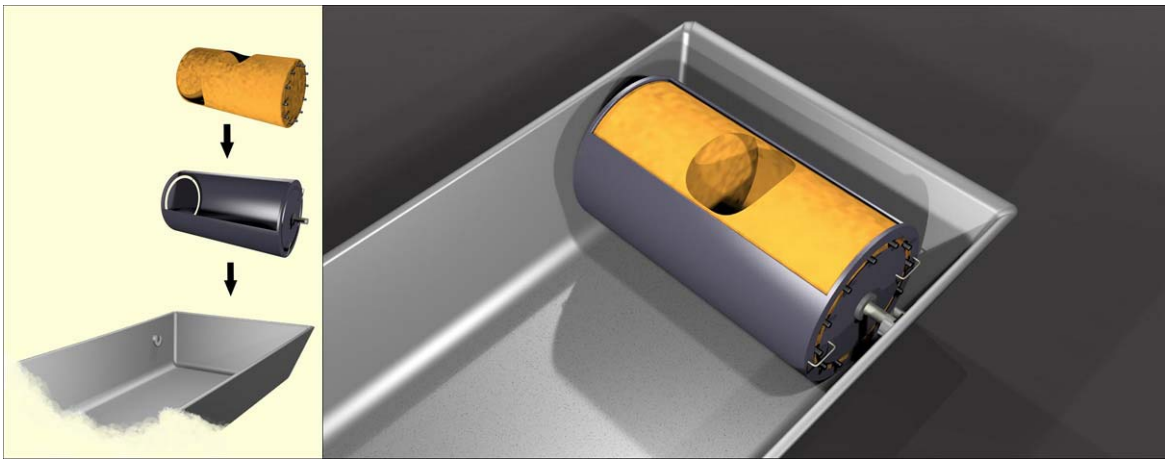

Fig. 2: 'A rotating drum container' concept created for pack a ski sledge (Picture: Heidi Ollikainen).

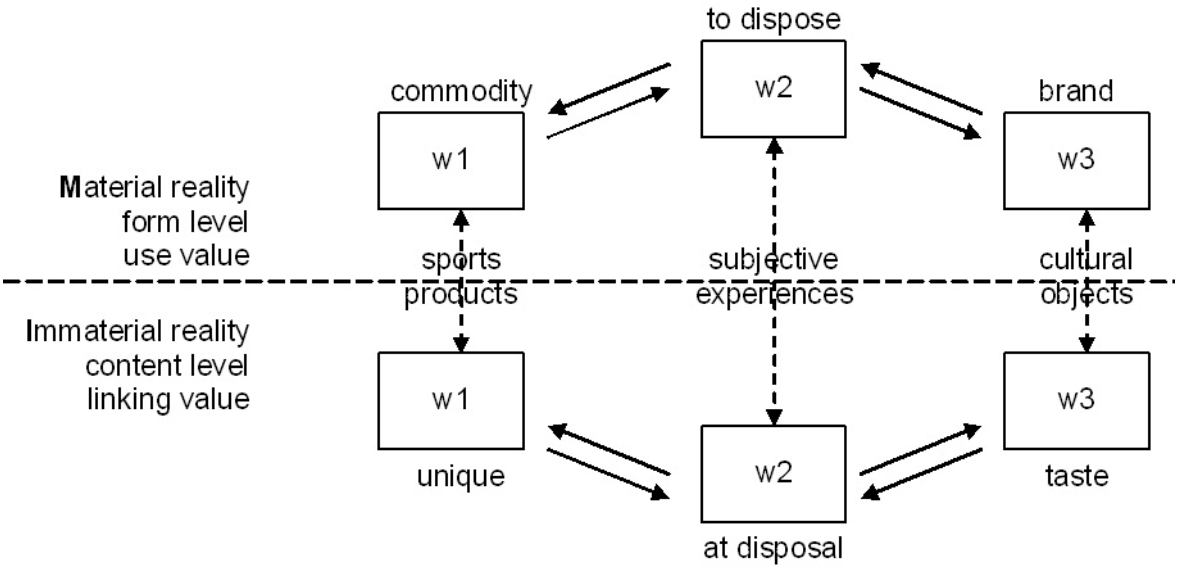

Fig. 3: Two parallel paradigms of ethically sound innovation.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Changing a phenomenal change

Reassembling the self through a new ethics of negotiation

Johann van der Merwe[1]

Abstract

The only change we can be sure of is that over which we do have control, when we change ourselves, and even then this *control* is mediated by our interactions with others, by a mediating and normative environment that includes the designed objects we let into our lives. That change, seen against a broad canvas of sustainable social structuration, is necessary, is not in doubt. How to go about effecting this change has to be, even if only for the sake of not making the same mistakes as have been made in the past. Change has to be controlled *from within*, has to be designed into being as a normal part of the individual's ongoing growth process.

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1. Introduction

I am an anarchist, but I am also a sunflower. I am contradiction itself, a fact that I have always known and come to terms with. That I am in truth an anarchist, as well as a contrarian, came to me very much later. Noam Chomsky would fain call me an anarchist for my beliefs, and recently I have discovered, through Marco Susani's work, that my structure seems to resemble the networked, and strange, social environment he calls the *Sunflower*. But, more of that below (3. Ontological phenomenology).

First, to this matter of anarchy. According to most peoples' definition, an anarchist is someone who throws bombs and wishes to destroy all forms of government, bad people, in fact. Most decidedly anarchy is equated with loss of control and chaos. However, the Wikipedia definition notes "that anarchy does not imply nihilism, anomie, or the total absence of rules, but rather an anti-authoritarian society that is based on the spontaneous order of free individuals in autonomous communities, operating on principles of mutual aid, voluntary association, and direct action" (Wikipedia). In terms of the aims of this conference, does that sound familiar?

One of the aims of Changing the Change is said to be a strong and ambitious political goal, and to enable this transition towards a sustainable knowledge society, can we do so from within the existing socio-political structures? Changing the Change stands for a new social structure that takes control of its own sustainable future, and what it hopes to motivate is exactly this "spontaneous order of free individuals … voluntary association, and direct action". Whether you prefer to call this anarchism, minarchism, or libertarianism does not matter so much as the argument for rediscovering some of the social structures human societies have historically developed for their local needs, and the fact that what is needed is the anarchistic ideal of *the least amount of control* that any social and long-term sustainable structure can get away with.

According to Chomsky (1995) he was attracted to anarchism as a teenager, and, *as a way of seeing the world*, anarchism afforded him the possibilities of social boundary transcendence. No one would call Gadamer (1975) or Derrida (1993) anarchists, but Chomsky's experience tallies perfectly with their account[2] of social barriers (norms, habits, rules) that have to be transcended for the sake of personal/social development, while at the same time, respecting those very boundaries. No throwing of bombs, then, but always a questioning of the status quo. Chomsky has had no occasion to change his mind since, but, on the contrary, he has made it clear that his goal is to "seek out and identify structures of authority, hierarchy, and domination in every aspect of life, and to challenge them; unless a justification for them can be given, they are illegitimate, and should be dismantled, to increase the scope of human freedom. That includes … our control over the fate of future generations (the basic moral imperative behind the environmental movement, in my view), and much else" (Chomsky 1995).

It is this anarchistic questioning of the status quo that aids my interpretation of Ezio Manzini (2007a), who talks about a 'double transition' taking place, the first (1) created by our social and living / working environment increasingly being underpinned by connective and globalising technology, while, at the same time, and precisely because of this, we are confronted by persuasive evidence of having reached the tipping point of our planet's life-sustaining limits; and (2), since this change is 'deep and fast', a concomitant and second transition is necessary, one that can provide a re-orientation in our very way of thinking. In this paper I will focus mainly on (2), and present a case study that highlights the active

[2] Gadamer and Derrida, in later correspondence, substantially agreed on this issue.

involvement, and the consequent re-orientation they went through, of students of design (3rd year Industrial Design). They will all enter the world of work as, potentially, the future of design itself, and hence also, potentially, as the future of the discipline of design.

The design research results show that an abstract model for a self-organising ontological framework can be applied by individuals, primarily to their own identities, as the start of a catalytic process, with the ensuing re-orientation of design knowledge as a comprehensive end result. It is in this sense that I attempt to answer Jorge Frascara's (2007) question, "How can a new direction be applied to the way things are, and change our culture into a sustainable one?" As Gadamer (1975, 238-239) and Derrida (1993, 919) confirmed, 'the way things are' must be respected, and ways found, rather, to transcend these paradigmatic ways of thinking. Frascara's 'new direction' must come from within the individual, and in this way social paradigmatic thought can be 'transcended'.

However, despite this evolutionary and revelatory process being an individually cognitive one, there are ways of sharing this knowledge among groups of like-minded people, the first methodology discussed being actor-network-theory, also known as the sociology of translation. Latour (2005, 108) makes it clear that 'the social' must be explained, from within, instead of 'the social' being seen as an entity that can explain things. All social groupings, even the newly formed sustainable culture Frascara calls for, will fall back into the trap of normative (fixed) social structuration, unless they pay heed to the insights afforded by actor-network theory. As Giddens (1984, xx) puts it, the "concentration upon epistemological issues draws attention away from the more 'ontological' concerns".

The second methodology discussed in this paper is thus ontological phenomenology, a study of how we look at and experience the world. Mugendi M'Rithaa (2007) asks, "If Africa does not have a lot of money, what then does it have?", and his question implies that we have to look to what each region really has to offer. Like all other regions, Africa's resources are people, and the cross-cultural ethics of *Ubuntu* (being human through others) depends on people – individuals – to uphold the conditions for a sustainable future. Ubuntu is at the same time a social/cultural grouping approach/viewpoint, but, crucially, it depends very much on the individual recognition of the other to work, thus forming a group of like-minded people.

2. Actor-Network Theory

As a way of sharing knowledge among a group of like-minded people, actor-network theory (ANT) is a methodology that works well for designers, but we must remember that, as a theory, ANT is not appicable to anything (Latour, 2005 141). Any good methodology, as a good theory, is not a method for doing anything, and it is not a recipe that guarantees an outcome. Bruno Latour's (173-74) description of how ANT can be useful includes "specific tricks to help resist the temptation to jump to the global", because, in the very act of communication, in forming networks (even if only between one local actor and a second), we are moving ('jumping') from the local (the individual) to the global, to the many, to the away-from-us. "A ploy has to be found to make the two social theories diverge, letting the sociology of the social go its own way while the sociology of associations should be able to keep drawing more and more acurate maps." ANT is, simply put, [1] a way of looking at the roles that human and non-human actors play in any one situation, with non-human actors identified as designed objects, rocks in the road, the snow in winter that will not let your car start, the window that sticks and will not open. Non-human actors are all the external-to-being-human objects (even events) we notice when they do not work as they should, and, more seriously, objects that intrude in our (un)consciousness and our decisions even though we are not aware of the fact. ANT looks at the relationship we have with these objects, and considers the observation of social systems as of necessity having to include both. More to the point, but more difficult to 'see', is the ANT approach to the context of the

social. There is no such thing as 'the social' in ANT terms, because "In the alternative [ANT] view, 'social' is not some glue that could fix everything including what the other glues cannot fix; it is *what* is glued together by many *other* types of connectors" (Latour, 2005 5). When ANT speaks of the social, [2] what is meant are the *associations entered into* by the members of that 'social' – which can be a single conversation between two people, or a whole group of like-minded designers coming together in order to decide on the way forward, for the sake of a sustainable, living future. The 'social' is a temporary concept, which might last for many years, or centuries even, but change it most certainly will, and in our contemporary age change is not only inevitable, but fast.

When we consider the importance of communication, it has to be borne in mind that what is of essence, for understanding human relations, is the *associations being entered into* in the very flow, in the act of true communication. If there can be a glue that holds everything together, it is this. New associations mean new ways of augmenting existing knowledge, in fact, it means that learning takes place, and that means *the new individual* is at the heart of this association[3], or *reassembly*, as Latour prefers to call it. ANT, it must be remembered, is also known as the sociology of translation, and it is well to remind ourselves that the act of communication (any relationship with the external-self) is at the same time a *transportation* of both what we know and of the information we are dealing with, a flow from one contact point to the next, and in this flow *transformation* takes place. Giddens (1984, xx), in focusing more on 'ontological concerns' rather than on epsitemology, meant by this statement that his structuration theory of the social "should be concerned first and foremost with reworking conceptions of human *being* and human *doing*, social reproduction and social transformation". To designers, these 'ontological concerns' should mean, very simply, an ongoing and constant becoming (Heidegger 1962, 359), the crucial point, to both Latour and to Giddens, being that the people making up the grouping, and the designed objects and systems we surround ourselves with, cannot be separated as if they do not structure each other. In this duality of structure, the human need to voice what cannot be seen (human-world experience) nevertheless demands shaped expression, which becomes literature, art (Steiner 2002, 279-280), or becomes design, an outward expression or manifestation of who we are, and what we want or need to become.

That, I believe, can be achieved by making use of, amongst other 'like-minded' theories of being-human, Heidegger's notion of ontological phenomenology, or at least my ANT 'translation' of the term. Phenomenology is the study of how we look at and experience the world, and it is a study of subjective experience, following Husserl, although some have used this approach to deny any experience beyond the concrete objectivity of *what is*. Others have contrasted phenomenology to ontology, which studies the essence, the very nature of existence. Put the two together, and Heidegger's ontological phenomenology starts to make sense, in that individuals can study themselves as developing structures, coming-into-being through a movement away from the *what is* existence of a concrete world, towards a possible existence in renewal. Ontological phenomenology allows each individual to map their own progress, even (*especially*) from within the group, of like-minded people, of course. However, instead of describing this methodology in detail, I would like to focus on one particular manisfestation of looking for the invisible.

3. Ontological phenomenology

We are adept at dealing with things contradictory, and we even deal with things invisible to a remarkable degree. When we make meaning (we usually say, when we make sense of something, but that *is* manufacturing meaning), we are dealing with the not-yet, the invisible that Merleau-Ponty (1968, 215) classified as meaning, emanating from the

[3] This new individual connects ANT to Heidegger's ontological phenomenology.

inner framework of the visible as a *virtual focus* that will not let itself be looked at or looked for, because it will then simply disappear. Contradictory, yes, but also normal cognitive human behaviour, and just because so much of it happens on a tacit knowledge level and as such remains out of sight (but not unobservable), does not mean we cannot investigate this phenomenon. When dealing with the human need to voice what cannot be seen, we are trying to find ways to make sense of the world, not simply as it presents itself to us in concrete fact, but in non-material, relational meaning, and especially in terms of the effect of our communicative networks. How does this outward, shaped expression come into being, and how do we voice the invisible? How do we talk to each other?

Marco Susani (2002) begins this descriptive journey through the different stages of networked communication by starting with the *Womb* and ending with the *Sunflower*. Susani began his presentation at Doors of Perception 7 with a quote from Herman Melville: *It is not down on any map. The true places never are*. Communication between two people, two systems or entities, creates new places of meaning, with a virtual focus, as Merleau-Ponty (above) stated, because these true places are not on any map,and cannot be seen, yet we have to voice these places, or rather, we have to voice what happens in these virtual spaces. A very difficult thing to do, indeed. We are continually speaking of things that do not yet exist, which is why Susani (2002) is "trying to map places that are intangible and invisible; the flows of communication and the places where they happen". These true places are in peoples' heads, and Susani appreciates this phenomenon as very rich in possible content, and he even labels this human phenomenon as "wireless, networked ubiquitous communication", because each individual phenomenal communicative event depends on at least one other, hence the first phase called the *Womb*. Our language use is largely dependent on the use of metaphor, which is possibly why Susani and his colleagues decided on a list of named forms to describe the communicative patterns being established when two or more people join in a networked effort to make sense of the world, beginning with the *Womb*, a space of communicative sharing that, in belonging to the two people so intimately sharing that meaningful space, begins to take on this shape that seems enclosed and inward focusing. As more and more people in different configurations join the network of communications (closely resembling the networked effects of actor-network theory), the shapes or forms of these intangible and invisible places begin to vary, taking on the configuration of the actual network of communication, taking on the shape(s) of the consequential possibilities, of these communications, as it were.

It would be impossible, here, to deal with all of these permutations, but I would like to focus on two others before arriving at the *Sunflower*. The next form, for my purposes, is the *Infinite Star*, a recognisable network of communications that resembles the space of flows – Felix Stalder (2002) gave a descriptive example in likening this structure to the Dutch East-Indian spice trade: there has to be a medium through which things flow (the oceans), the stuff that flows (spices then, information now), and the nodes between which flows happen (the harbours that served as starting and end points for the ships). The *Infinite Star* has groups of people as the nodes, between which groups the information flows, but all the nodes are in principle, and usually in practice, connected. Susani sees these nodes as communities that are broadcasting to each other in a peer-to-peer network of communicative flows, overlapping, because every node is connected to every other node in the system, forming "a continuous space that connects infinite points" (Susani 2002). The content, Susani states, is what holds these groups together. The spices (their entailments) held the trade between Amsterdam and Batavia together, bound them in communities of practice, in the same way that groups of designers (design students!) need, not actual 'content' but purpose, new associations, to help them create an *Infinite Star* continuous space of learning.

This, it has to be said, is too easy. On the way to the next form I refer to (the *Flames*), Susani deals with an increasing complexity of communicative flows, because, being human and not being able to do anything else but participate in a group *as an individual*, we cause the stuff that flows to keep on adding to itself, and we are dealing with augmented upon

augmented individually interpreted/translated narratives that circulate between nodes, *collectively as group narratives*, and between the individuals that make up each node, to again be augmented individually. Susani (2002) speaks of "a kind of viral diffusion. Sending the message of the message is a kind of social space that is infinite: we call this the *Flames*". A veritable fractal space that networks in an almost biological fashion (as opposed to the clean, linear, controlled diagrammes we usually see purporting to represent these networks). Where the *Infinite Sta*r is still easily 'managed' as a network of communicative flows, in reality communication flows where it will, and in education terms, must be allowed to connect, augment, and be virally diffused as it needs to, given the 'harbours and ships' at its disposal at any one time – the designers in the group of like-minded people, the members of the public that share a common goal of everyday sustainability, or the students in a design class, this potentially infinite social space that links formal with informal learning, this discontinuous space of learning.

"Now imagine the same structure with the same flames going around, but combined with the idea that then, at a certain point, they gather, they return back to a single space" (Susani 2002). This is the *Sunflower*, a networked, and strange, social environment form. We are dealing with a circularity (true to the essence of cybernetics and design) that finds order in seeming chaos[4] (have you tried *counting* the tiny florets in a single sunflower head?). That order, or comprehension / understanding, that is the relational principle behind this networked communication, begins with the individual and ends with the individual. There is no such 'thing' as a group, just as there is no such thing as the social[5]: there are only individuals and there is only communication[6]. We, all the individuals who make up the sunflower head, need to find a way to deal with this very compact, very complex mix of communicative flows, and we need to do so in this new, *single space* (Susani, above).

Oh, dear. Now what? First we had the *continuous* space of learning, then the *discontinuous*, and now we're back to a *single* space? At this point many a student gives up, or it might seem that way, at first. I am trying to find out why they do not lose their way completely (cf. 4. Student case study), despite these very intricate and complex issues being discussed in class. How is it possible to speak about complexity theory, to discuss Heidegger's ontological phenomenology and Bruno Latour's human and non-human actors with a class of third year design students, and, heavens forbid, keep their interest? There is, only and ever, the individual. Everyting else is manufactured, socially constructed, and increasingly difficult to comprehend.

True and sustainable *group* understanding of important social issues depends very much on *individual* understanding and endorsement of those same issues. The group does not exist, the social does not exists, except through the individual. Alain Findeli (2001, 12) called for a renewal of design education, because he believes that "A system, and especially the human or social system, is best understood from within, through a qualitative, phenomenological, approach". My version of this injunction is to focus on the new individual, within the old self.

4. Student case study

[4] Sunflowers, daisies, and the beautiful Echinacea purpura are contradictory flowers, since what we see as the 'flower' is, in fact, not. The head of a sunflower is composed of many florets densely packed together, in this *single space*, which, on closer inspection, turns out to be very ordered indeed, according to the mathematical, yet biological, logic of Fibonacci numbers (the Golden Mean or Golden Section, derived from the spiral shape of i.e. the Nautilus sea shell and the head of a sunflower, is an example, one that has always inspired artists and designers).

[5] Latour (2005, 7-8) reminds us that 'the social' is an invisible entity that only exists because of the participants, and these 'elements' are themselves not 'social'; Latour defines *the social* "as a very peculiar movement of re-association and reassembling".

[6] We are who (we think) we are through communication (negotiated, interactive building of relationships, above), or as Luhmann (2002, 156) puts it, "only communication can communicate" in the networks we have to build, and the resultant actions we decide upon are the result of our understandings generated within these networks of communication.

Humberto Maturana (1980, 2) asked this question: *How does it happen that the organism has the structure that permits it to operate adequately in the medium in which it exists?* (discussed below). That question had a more practical focus, namely: *how is it possible for pigeons to deal with the world of form and colour*? Maturana, being a biologist, at first wanted to know what form and colour looked like to a pigeon, but he got no answers. The world intruded (in the shape of student riots in Chile) and he changed his observational position; instead of asking a semantic question, he asked a structural one: instead of asking *how does form and colour present themselves to the pigeon*, he asked, *what does the pigeon need to observe the world out there*. Ergo,the Project 2 design theory essay question[7] to my group of 3rd year Industrial Design students: *How could students acquire a structure enabling them to operate innovatively in a modern design environment*?

Apart from introducing the students to systems thinking[8] early on, and then moving on to cybernetics[9], I deal with Alexander Manu's The Big Idea of Design, which asks of them to strip away everything (to do with 'objective' detail) and instead look for the essence of any object, to look for the origin of a designed artefact and the role that this non-human actor initially played in our lives, and the (possibly) changed role that its progeny now plays. Having done that, we move on to questions such as, *What is the Big Idea of a "self / identity"?*, and for good measure, *How does education and self/identity relate to each other (relationship of what purpose?)*. To put some more pressure on them, I have them read Anne-Marie Willis's *Ontological Designing* (1999), which deals with both Heidegger's notion of *becoming*, and the life worlds inhabited by both objects and people. Having come so far it couldn't hurt to introduce actor-network theory, could it? I purposely try not to give the students too much information (aka 'prompting'), but try to give them access to as much relevant sources as possible, and, because they have to do quite rigorous research, *and* work in groups (always, in the initial stages, to share data and in developing information platforms), we also discuss their developing understanding of the topic(s) as much as possible. The students, in fact, have to regard themselves as their own product, and observe where, how and why they acquire the structure just right for them to deal with the world of design, and *then* they are able to tell me (and themselves) whether they are still of the same mind (mostly not!), or whether they have discovered their own Alexander Manu moment of change. I am, in fact, asking the students to deal with the complexity of communicative flows (Ezio Manzini and Felix Stalder on the Space and Pace of Flows), networking (Maneul Castells), rhizomes (Deleuze & Guattari's organic networks), Wolfgand Jonas's *groundless field of knowledge* and Edward .O Wilson's *consilience* ('jumping together'). Oh, and complexity theory, of course. They hate me.

The fact that Donald Schön[10] promised this would happen is no great solace, to begin with. But perturbation does work, in a kindly, anarchistic kind of way, even though it must appear as utter chaos to the students at first. Too much information, too new, and too fast! they cry, not realsing that they should be lamenting *I do not have the structure that can deal with these new worlds opened up by this information*, hence the Project 2 structural research question: *who are you and what's your knowledge-acquiring structure like*? It is not the content of the course, not the information they work with, and not the articles I make them read that is the focus of this theory class, but the individual. The students have to learn how to learn, and to do that, with self-knowledge, they have to learn about themselves first. These are some of the insights they reached, as individuals, supported by group discussions:

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[7] This is not an English class, so I expect, and discuss, the necessity of working from a research-based proposal structure.
[8] Peter Checkland's Soft Systems Methodology (cf. also Donella Meadows' *Dancing with systems*, 2001).
[9] Second-order cybernetics differs from first-order cybernetics, in that it does not deal with predictable and ordered systems, but studies the observation of observing systems, i.e. *us*.
[10] Schön is famously credited with believing that students need to be 'frustrated', because they have to learn to work in the "indeterminate zones of practice – uncertainty, situations of confusion and messiness where you don't know what the problem is" (Schön, 1987).

- Somewhere along my development I made the transition from being taught to teaching myself [and] the way in which the individual react to this shift in responsibility seems to differ from one person to another;

- [I have learned to] look at the holistic picture and direct my vision away from purely relying on my own opinion and presumptions;

- Some people believe that the ultimate goal in life is self-fulfilment, however the only way in which to really create one's own happiness or reach 'completion' as a human being is to make others happy;

- My purpose for wanting to learn continuously is tied up with my outlook on life and my purpose as a human being;

- Every product that I develop must have a purpose and will always have consequences.

The fact that these comments are centred on individual viewpoints – the first person perspective - is mitigated by the realisation that the 'I' is here dependend on the 'other', that the students clearly see their roles, as designers, intertwined with their roles as human beings among other human beings, and not just as designers v. users. To understand the human social system from within, as Alain Findeli (above) urges us to do, is to understand the individual inside the communicative and learning system, and here I can refer to Fig. 1: *The wickedness of design education*. My design theory classroom is a social constructivist space for learning, and this illustration tries to make sense of the invisible, in fact tries to map Susani's (2002) "places that are intangible and invisible; the flows of communication and the places where they happen". What should be a straightforward input / output with-feedback-loops structure is anything but linear and easy, and very difficult to 'map'. Susani's communicative forms and actor-network theory's relational principles make it rather more understandable, from the viewpoint of seeing this on paper, but what if you were *inside* this process, right now, and couldn't see anything for the 'chaos', the *oh, this is too much* stuff swirling around your head? Imagine a student with an education-sponsored 'map', trying to find her way towards what we would like to call 'knowledge'. Instead of the relatively easy to navigate situation of Drawing 6, the direct interaction between teacher and student (comparison with Susani's the *Womb*), this poor soul finds herself in Drawing 10, which, if anything, resembles Susani's *Sunflower*. For a 'map' to be of any use whatsoever, it must be drawn by the student herself, inside the group, with the help of the group members, of course, and especially if she, no, *when* she reaches the point of being able to make full use of this 'single' *Sunflower* space, she will be able to handle any situation in the real and complex world, because the new 'map' coming-into-being is her new self and the new strucure *enabling her to operate innovatively in a modern design environment*. That new self emerges from the wavefunctions (below) of all the individuals in the *Sunflower* single space merging, when "they return back to a single space", because sometimes, as Arato (1994, 130) said in discussing Luhmann's work, we are looking at "a whole which is paradoxically conceived of as its own part". As another student reported, "a conciliate model for my design thinking can only be created when all my experiences and influences cease to be … only then can this 'jumping together' and blending of information become conciliate", only then can he experience Susani's *turning back to a single space*.

In Fig. 2 we can see another version of both Susani's *Sunflower* space and Drawing 10 from Fig. 1, a system that works on two levels, depending on your observational position. You can either look at the whole classrooom as one entity, and see all the students following this same system of discovery as a group, but you can also, and should also, see all of them, at the same time, dealing with their own Fig. 2 systems, while linking into the growing network, and becoming each other's data-into-information inputs. "By conserving [making the distinctions and choosing] tested and examined information, I will start to form

my own design identity", while seeing education as a reaching outwards to the rest of the group, and beyond, in this discontinuous space of learning turned back on itself.

5. Discussive afterwo/ard

I spoke of the African cross-cultural ethics of Ubuntu earlier on, a notion that depends on people, *as* individuals, to uphold the conditions for any sustainable future. *Sawu Bona* ('I see you') is an example of this, but it can only, effectively, happen between individuals, and emerge, willingly, from within each individual, and, like this friendly greeting between two human beings, cannot be enforced from 'outside', but is a constant becoming, an awareness of the phenomenological effect of an "open atmosphere of learning" (Grant 2005, 564). As Seamon (quoted in Grant 2005, 564) found, it (this phenomenological cross-over between the self and the other) can become an "intersubjective verification … to establish generalizations about human experience". What Grant is advocating (my 'sociology of translation' reading of Grant), is a phenomenology of practice , a cooperative responsibility that becomes the "transcendental intersubjective essence of all audiences" (Grant 2005, 576), or another way to share knowledge among groups of like-minded people, a way to transcend the difficult social boundaries that too often 'follow' (are persuaded to obey) economic and political agendas other than the direction advocated by this conference.

The *Sunflower* single space becomes Grant's phenomenology of practice, within which the intersubjective essence of each individual can be shared among the members of a grouping (actor-network), as Grant's *audience*, the members making up this audience listening to each other, and collectively saying *Sawu Bona*, I 'see' you, I acknowledge who you are, what you stand for. We are dealing with a collective paradigm shift, in everyday knowledge generation, from individual 'knowledge' to group 'knowledge', but this process then shifts back to the individual, again; the new individual, within the group, that is not, just as the flower of a *Sunflower* is not (an individual flower, that is, but a collective). This is totally contradictory, and totally quantum physics: two states of existence can be 'true' at the same time, depending on your observation position. When each individual reaches a state of augmented, enhanced participation in knowledge generation (which, as I am sure you will agree, can only happen internally, hence individually), then the wavefunctions[11] of all the individuals within a group such as the *Sunflower* begins to merge, and we can understand why Susani could ask us to "imagine the same structure with the same flames going around, but combined with the idea that then, at a certain point, they gather, they return back to a single space" (Susani 2002). Merleau-Ponty recognized transcendence in the new becoming-self that is always just beyond existing borders, and as Lingis (1968, *I-li*) states, Merleau-Ponty regarded 'the visible' (compare Susani's *Sunflower* single space, but envisage the real group) not as an assembly of individuals fixed in space and time, but as a field, a moving, human landscape ('topography') of possibilities that unfold by making distinctions[12], but instead of disintegration, a *re*integration takes place "through the reflections, shadows, levels, and horizons between things (which are not things and not nothing, but on the contrary mark out by themselves the fields of possible variation in the same thing and in the same world)". The individuals make the group, and the group makes the (new) individuals, as long as we remember that these flows of communication can be effective only when we realise that "this system of lines of force, are not *what* we see; they are *with which*, *according to which*, we see". When wavefunctions merge we are within reach of this new single space.

[11] A wavefunction is a term describing all the information content of what is being observed, at that time. Compare this to the information / knowledge content of each individual, at any one moment.

[12] Luhmann (2002, 3), in a statement reminiscent of the development of second-order cybernetics, affirms that "we are no longer in the realm of a foundationalist 'first' philosophy but rather in the realm of a 'second-order' philosophy of observations of the observations of self and other".

Complexity theory gives us an insight into what has been happening to human networks, on an everyday level, for as long as we have felt the need to gather as a social group for a defined need, such as now. My argument is that our central nervous system, as a sensing organ, and on a metaphysical level ('activated' by the memory knowledge of physical phenomenology), uses the projective functions of our consciousness in a deeply biological way that follows the structural understanding of Maturana's (1980, 2) question, *How does it happen that the organism has the structure that permits it to operate adequately in the medium in which it exists?* How does it happen that the individual has the capability of operating adequately within the group in which it finds its (new) self, i.e., where the individual finds a sense of place / belonging*?* Monod (1997, 155) speaks of a non-verbal mental reflection that, as a projection, imagines or simulates an experience (of the 'outside-self') based on forms, forces and interactions. That means the 'structures' (Susani's *Womb, Flames, Sunflower* forms) encountered in this 'outside' social space become the structure of the organism, initially, and on further development, both sets of structures 'recognise' each other. *Sawu Bona*.

Based on the work of Davies (2000, 43; 243) and Prigogine (1980, 89-90), my argument is that the complexity of quantum physics makes this possible, and even though a wavefunction is known as a mathematical object, it does represent the information content of any existing state, and most importantly, it is non-local, i.e. ubiquitous, and ideally suited to a model of social structuration. Furthermore, to complete the correlation between complexity and human knowing, atoms have both particle and wave-like properties: socially, we can *be* the system and the environment, an individual *and* the group, at the same time. We can be our own autopoietic system, self-organising and 'closed off' from external forces, but we are also the environment that sustains us through 'natural' interaction. We are our own internal information for own consumption, but we also 'identify with the object itself', becoming part of the environmental information, sharing *with* the group and sharing *in* the group. In that sense human knowing is (at least) two wavefunctions that collide, two information structures that form a new entity via a phase transition[13]. Individually, as the collective, we *are* this new single space.

Reassembling the self through a new ethics of negotiation, it seems to me, becomes the new student body politic. They now *comprehend* their own identities by reassembling what they thought they knew, about the world, about knowledge, about themselves. Actor-network theory, networking with ontological phenomenology, allows them to map their places (of negotiation) *as* they map their journeys of discovery and learning, and seemingly as a matter of course locating ethical responsibility as "… more than [being individually truthful] … something much more than making wise choices … Our moral obligations must … include a willingness to engage others in the difficult work of defining the crucial choices that confront technological society" (Herkert, 2002). Reassembling the self in this fashion can create Manzini's deep and fast second transition, that crucial reorientation in our very way of thinking.

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[13] These last two paragraphs, substantially, appeared in "The complexity of design as a wavefunction", Pre-proceedings of the 3rd International Workshop on Complexity and Philosophy, February 22-23, 2007, University of Stellenbosch, South Africa.

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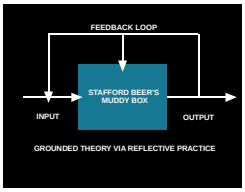
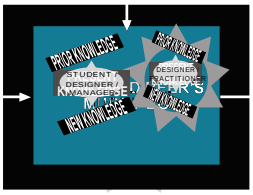
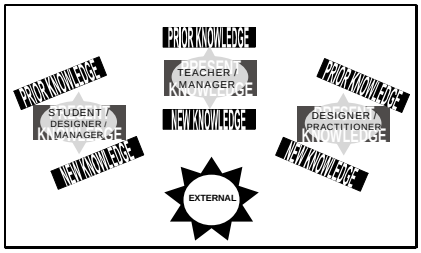


1. The constructivist classroom depends on feedback loops as a measure of calibration

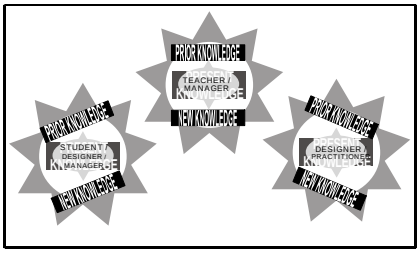
2. Design is, however, not so neatly linear, but quite grey and wicked



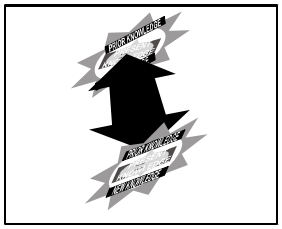
3. To make sense of the active and re-occuring patterns, we artificially slow the process down to see what's going on



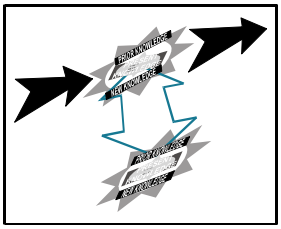
4. Simplistically, the classroom contains three units: student, teacher and external information. But each of the three units consists of prior & new knowledge; each deals with its own input/output feedback loop



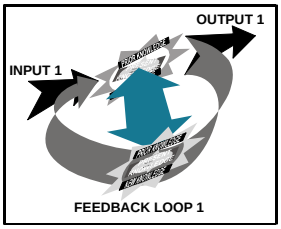
5. Even this is too neat and controlled, because each of the three units also have to contend with many other external > internal inputs in real and retrospective time



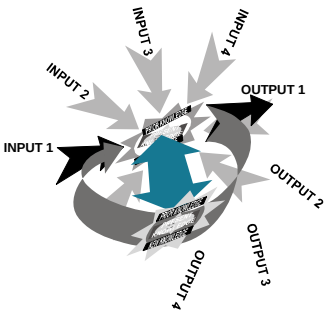
6. Besides the real/retro & internal/ external influences on each unit, the teacher as classroom manager has to foreground the interaction between teacher & student
"THE WOMB"



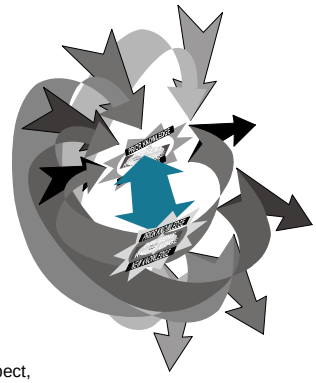
7. This direct link also depends on managing the input/output feedback loop, which, on a macro level follows the design curriculum ...



8. ... but on a micro, classroom dynamics, level follows the active design learning situation, with the teacher/student interactive link, calibrated to the output, changing the input in real time



9. How can the student learn to manage the input in real time, plus add to the original input in retrospect, when each of the many possible feedback loops are active, and effective, at the same time?
"THE FLAMES"



10. In real time, this is what the picture looks like: this is Rittel's Wicked Problem Situation, seen as multiple input/output + feedback loops, or Activity Theory in action. This seeks to understand the unity of consciousness and activity, since the input/output relation between the student and information is neither mechanical nor given. "A much richer depiction of the user's situation is needed for design and evaluation" (Nardi, 1996)
"THE SUNFLOWER"

Fig. 1: The wickedness of design education.

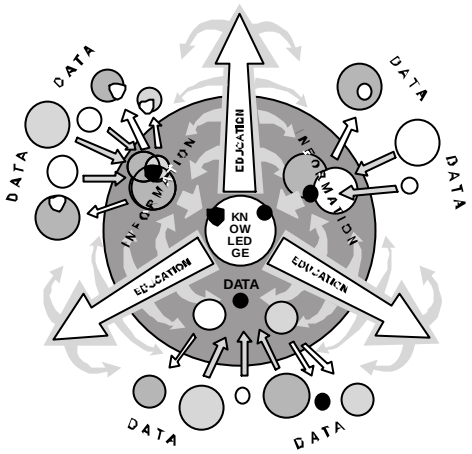


Fig. 2: The creation of a design identity.
Chrispher Eksteen, 2007, with modifications by the author.

Insert image in box max. 16 x 20 cm.

Add up to 3 images.

If you are submitting a visualization,
please use this area to insert additional images.

Fig. 1: caption of max 40 words – caption text arial 10pt

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

CONCEIVING THE DESIGN CENTRE OF THE FUTURE

Design vision

Transforming the economical and social landscape through multidisciplinary projects and integrated user-centred design research

Mark Vanderbeeken[1], Jan-Christoph Zoels[2], Michele Visciola[3]

Abstract

In this paper we present our vision of a future design centre with a high economical and social relevance, brought about by its ability to develop concrete, design-driven local and regional solutions, departing from the current and future needs of people.

The introduction describes the context in which this vision came about.

The second chapter presents the design research methods and results that formed the basis for this vision.

In the third chapter we elaborate on the vision, mission and concrete functioning of what has since become the “Transformation Factory”.

The fourth chapter contains examples of how the Transformation Factory will be of concrete economical and social significance for companies, government institutions, semi-public organisations, educational institutions and designers.

In the fifth chapter we point out the next steps that need to be taken in order to realise the Transformation Factory. The sixth chapter contains conclusions.

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1. Introduction

As many other places, the Belgian Province of Limburg is under pressure to evolve towards a knowledge economy as soon as possible. Within the last twenty years, Limburg has had to deal with radical changes in its economical and social tissue. One of the major economic setbacks for the region was the closure of the local coal mining industry. Larger locally situated companies such as Ford are increasingly relocating their activities to foreign countries. The region is suffering from relatively high unemployment rates, problems with integrating a large immigrant population, and a relatively low educational level. In addition to that, it will soon have to face the economical and social consequences of a rapidly ageing population.

In addressing this context, both the public and private sector are counting on innovation with an emphasis on creativity and multidisciplinarity. Reinforcement of the region's development is needed in order to create new processes, services and products to address current and future needs and meet the demands of future national and international markets.

Since July 2007, Experientia has been working with the Belgian City of Genk, the Belgian Province of Limburg and the Media & Design Academy (M&DA) in helping them to define a future design centre that will stimulate and support creativity and innovation within companies, cultural organisations and social institutions. It will be located at C-Mine, a former mining area that is being transformed into a creative hub for creative institutions (such as the Media & Design Acacemy) and innovative companies (Jaga).

2. Emphasis on research

To ensure the concept we were asked to develop would be of relevance to the needs of the region Experientia applied a user-centred research approach in the development of the design centre concept.

Stakeholders and end-users were actively involved during both the research phase and the vision and concept development phase, which included:

- A benchmark study of 70 design centres from around the world;
- Twenty in-depth interviews with various stakeholders about the region's social and economical characteristics, current and future needs, and their vision on what the design centre should be. The interviewees were key figures in the fields of politics, industry, design and the social sector from within and outside the region;
- An analysis of existing studies about design centres, exploring developments and current and future trends;
- A co-creative workshop with a selection of key stakeholders;
- User-centred design research has also been integrated into the functioning of the design centre itself. Putting user needs and the way people interact with products or services at the very centre of the design process will be the central working method according to which the design centre will handle all its projects.

The results of the research phase were very encouraging. The literature study pointed out that even though most design centres are currently mainly focussing on promotional activities, workshops and direct consulting, there are new developments taking place on an international level:

- There is an increasing emphasis on project based support for companies ("design management"), instead of focussing on promotion and design in itself;
- There is a growing importance of design as an instrument to create social and cultural change;

- The use of design to create and stimulate human focussed changes within the social sector.

In addition, there are certain themes that are gaining traction: User-centred Design, Sustainability and the intrinsic relationship between a broader design vision and innovation.

The increasing importance of the developments outlined above – company support, social and cultural change, design and the public sector – and the new themes also emerged from the benchmark. This study showed the role that design can play in the reinforcement of thematic communication and in an innovative branding of regions. It also became clear how important it is to have an integrated and strategic approach to design promotion and support, ideally in the form of a well-structured design policy.

The in-depth interviews have also generated a number of insights in what the needs of the region were and how the functioning of the design centre could be of relevance. This is described in the examples in the fourth chapter.

The research phase was followed up by a co-creative workshop from which the principle ideas for “the design centre of the future” originated, that are presented in the rest of this paper.

3. Vision

Our concept for a future design centre is called “Transformation Factory” (TF). We decided for that name because it implies the bringing about of concrete results and change. The TF will create positive change and facilitate progression, through design.

The Transformation Factory will create economical and social value for companies, government entities, semi-public organisations, educational institutions, and designers in Limburg and surrounding regions. It has to become a high level centre that is strongly focussed on the characteristics, needs and future development of the region, as they have emerged from our research.

Mission: The Transformation Factory will become a dynamic structure of the highest international level that develops scalable and multidisciplinary design innovation projects for (clusters of) regional companies and public organisations, to generate diversification and renewal within product and service development.

The TF will engage in coordinated projects with local partners. The projects will relate to specific themes, which will change every two years. These projects will be handled professionally through contracts and executed by a multidisciplinary team of local, regional and international professionals. The companies, public organisations and designers involved will benefit directly from these projects.

The first three themes the projects will relate to are mobility, wellbeing and social change.

Before we illustrate the mission and the functioning of the TF with a few examples, we will first describe the type of activities and its target groups six basic principles of the centre,

The TF will have three unique core activities:

- **Experience prototyping** - The TF focuses on the creation of products and services based on people's needs and contexts, and on the testing of the user experiences of these products and services that have been developed with them. In other words the TF focuses on understanding, designing and communicating the way in which the user interacts with a product or service by using a simple inexpensive prototype of the product or service.
- **Mentorship** - Limburg has numerous experts in business, government, public organisations and education. The TF brings these people together in multidisciplinary projects with the best students, young designers or young companies transferring knowledge, skills and experience from "mentor" to "apprentice".
- **Creative incubator** - The creative incubator offers - for a number of years - office facilities and guidance to those starting entrepreneurs who are from disciplines and backgrounds that are consistent with the mission and vision of the Transformation Factory and who want to work around the themes that the TF has chosen. These entrepreneurs are involved in the projects of the TF. The TF in turn enables these entrepreneurs to collaborate with other companies and supports them in their daily company management.

The action radius of the Transformation Factory will cover the Province of Limburg and the adjacent areas in Wallonia, the Netherlands and Germany (a.k.a. the EUregion). However, it will also aim at further international European collaboration.

Target groups:

- **Small and medium sized companies** - The geographical working area of the TF has numerous SME's with a company culture where creative innovation is not placed very high on the agenda. The TF offers the opportunity to set up projects with these SME's that will give them new added value, also in collaboration with employers' organisations that can further stimulate the SME's.
- **Government and semi-public organisations** - Many governments, on a local as well as a provincial and regional level, take initiatives to improve the conditions for economical growth and quality of life. For example activities have been planned in the fields of mobility, company infrastructure, regional strategic sectors (tourism, logistics, life sciences), care for the elderly and social housing. Also hospitals see their tasks change as they have to approach the growing group of chronically ill patients more as clients who rightfully demand these institutions to better address their needs.
- **Schools and universities** - The TF will provide new possibilities to students and graduates of the Media & Design Academy and other schools and universities. Project based experience at the TF can serve as useful input for the curricula of, and as crucial practice-based learning for these educational institutions.
- **Designers** - Professional designers will regularly be involved in the project based functioning of the TF.

The activities of the centre are based upon six core principles:

- **Project based** - By working on concrete and realistic projects in the region, in collaboration with companies, public organisations and multidisciplinary design teams, the TF will differentiate itself from other Flemish design initiatives and can also position itself internationally as a cutting edge institution. The projects will be of such an innovative character that they will not compete with the work of local designers and

design agencies. On the contrary: they will provide new possibilities for professionally activity in a renewed manner. As a project oriented organisation, the Transformation Factory will engage in a constructive and structural collaboration with important strategic partners, including other design and innovation structures.

- **Thematic structure** - The projects and activities of the TF will fit into specific themes that are driven by the needs of the local context and will change every two years. The focus on a series of broad, clear themes that are easy to communicate will structure the functioning, simplify the communication and increase the possibilities for de facto realisation of concrete and useful concepts, solutions and products.
  Each theme will run for two years and will be preceded by a preparation phase and will be followed up by an implementation phase (see Fig. 1).
  During the central execution phase, a multidisciplinary team of consultants and designers will work on the project, while during the first and the last phase, only one project member will be involved with the project.
  This allows time and manpower to be already allocated to the preparation phase of a new project as soon as the previous project is entering its implementation phase. This parallel process enables every new theme to start off well prepared with a first series of projects. Furthermore, the implementation towards similar contexts, companies and organisations afterwards will become easier, given the fact that time and resources are set aside for project implementation. It finally guarantees that there will be one responsible person for each theme who will become a point of reference for the entire project duration (from preparation to implementation). See Fig. 1: Thematic project structure.

  The first three themes are already defined but are still very broad in concept:

  - **Mobility**: this comprises public transport, traffic, logistics, automotive, bicycle traffic, walking trails.
  - **Well-being**: healthcare (ZOL, one of the main hospitals of the region, is a very interested partner), care for the elderly, tourism, leisure time, food, body care, sports etc.
  - **Social change**: sustainable development, renewable energy, social integration, multicultural society (with Genk as a laboratory).

- **Multidisciplinary approach:** The problems and challenges for companies and public organisations are often not resolvable within only one particular discipline or field. An increasing number of companies and organisations are asking for a multidisciplinary approach in addressing their challenges. Also educational institutions and research centres are grouping and organising themselves in multidisciplinary clusters (e.g. UK, Denmark and Finland). Also the TF will work with a multidisciplinary approach. The collaboration of experts from diverse disciplines will result in new, creative and innovative concepts that can be converted to relevant and useful solutions.
- **Radical choice for the end-user:** The most effective way to design a product, service or system that people really like to use and that they can use efficiently and effectively is to start off the design process by departing from the actual needs of the end-users. The M&DA and the radiator design company JAGA, both to be situated on the C-Mine area, have already implemented this design approach in their activities.
- **Company focussed:** The companies in the region of Limburg want more opportunities for project based experimentation and innovation. The same goes for public organisations such as government and healthcare institutions. A company focussed design innovation partner, such as the Transformation Factory would be of great value for these organisations.
- **Research based:** The hands-on approach could possibly leave little time and space for an in-depth thematic orientation in which research plays a central part. It is of

importance to create strong forms of collaboration with universities, sector organisations and innovation entities.

Legal structure, staff and finances – The TF will have the legal setup of a company structure. The design centre will profile itself as a business structure that aims to in time become a full-fledged economic entity with self-sustaining activities. Choosing for a company structure underlines the conviction the founding partners have in the economic viability of the TF. Also a private structure makes it easier for other entities to participate in the shared capital and in the managing bodies. The majority of the shares will belong to the private sector, which enables the structure to obtain enough capital to avoid liquidity problems when it becomes operational.

The founding partners are the City of Genk, the Media & Design Academy of the Katholieke Hogeschool Limburg, and the Province of Limburg. They will sign a partnership agreement in which they declare to agree with the mission of the Transformation Factory. The City of Genk, the Autonoom Gemeentebedrijf Genk and the Media & Design Academy will be the public shareholders of the company and will also be members of the Board of Directors.

Regional design and innovation structures Flanders InShape, Design Flanders and Innovation Centre Limburg will sign a collaboration agreement with the TF to become its strategic partners. Participating companies will also be a part of the legal structure. The funding for the TF will come from the founding partners and the companies that participate in the projects.

The TF staff will be limited to a small professional team with expertise in business management, general management, design innovation and technical commercial skills. For the execution of projects and assignments the TF will also hire external know-how. A limited amount of staff keeps the fixed costs low and offers the flexibility to hire a variable number of personnel.

4. Examples of themed projects

Mobility – Project: Spartacus

Spartacus is an extensive mobility project for the province of Limburg. It concerns the development of an entire express transportation system consisting of a network of trains, fast trams, trams/streetcars, express buses and buses that covers the whole of the province.

At this point in time, the Spartacus project is still in its phase of technical and financial planning. However, it will be an enormous opportunity for companies and organisations in Limburg. Not only because it will create a better mobility infrastructure, or that it enables them to work on the project by means of contracts, but especially because this project can serve to boost innovative thinking and stimulate the development of new services and products, which, after this project has finished, can be applicable to other regions, other contexts and other clients.

Spartacus will become operational in the year 2012 or later. Project concepts that could be developed by the TF in the period of 2009-2010 are therefore crucial and could have an impact that will last for several decades. In its approach, the TF will start from a number of questions that are in fact all design opportunities:

What is the future of mobile transport? How will the needs of the passengers evolve? What kind of technologies can we anticipate to satisfy these needs? How can the products and services that will be developed and implemented for this project, also be relevant for other future transport projects? How can those services and products be part of a broader vision for sustainable mobility? How can we test the use of these services and products thoroughly before they will be implemented on a large scale throughout the whole system at high costs?

Relevance to companies – How can the furniture for trains and waiting areas be imagined for the year 2020? How can the building materials such as steel, glass, concrete and wood be reconceived, in order to make a sustainable investment in the future of Limburg?

A design answer to such questions implies the development of innovative products, which companies can also propose to other clients. It is likely that in such a large scale, future oriented and multidisciplinary project, companies will develop new working methods and procedures and form new partner networks that can also be used in other contexts.

Relevance to government and semi-public organisations - Government institutions are by themselves no experts in the development of mobility projects. They will have to collaborate with private companies and other organisations. The classical top-down approach is not always the best approach for such future-oriented projects, because it often simply departs from existing models and seldom leads to real innovation that can provide competitive added value for the broader economy, apart from the project itself.

A project-based, multidisciplinary and strategic design approach allows these (semi) public organisations to be acting as team leaders within this very innovative project. This will renew and reinvigorate the relevance of these public entities, and create a positive communication for the region. Moreover, the organisations involved can assign some of their best people to work as mentors with designers and young company executives from the creative incubator in a project based collaboration.

Relevance to schools and universities - Schools and universities engage in socially relevant research. They want to realise projects with practical relevance and prepare their students for a concrete labour market. It is possible to do all of this with much more impact within an existing project that already features collaborations with an academic institution (Media & Design Academy), companies and government institutions, and where good quality research is of great importance.

In this concrete context students will be able to learn the more complex tasks of their discipline from mentors, and can work with companies and government institutions before they graduate. Research can be executed within the project and deliver results that immediately have a social relevance. New study and research methods can be developed that will lift these educational institutions to a higher level, also internationally.

Relevance to designers - Local, national and international designers will be able to work on future-oriented projects, applying the most up-to-date methods, and working within a multidisciplinary project team, together with companies and government institutions.

This will allow designers to greatly expand their knowledge and network, skills and experience. Moreover, their work will be of high communicative value because of the importance of the project. This will help them in finding new projects and clients.

Social change – Project: Master Plan for Great Sledderlo

Great Sledderlo, a neighbourhood within the City of Genk, consists of two areas – Old and New Sledderlo. In many ways the area is an uncompleted part of the City of Genk. Almost fifty years ago the City had the idea to build a major satellite city for 20,000 inhabitants, consisting of five neighbourhoods situated around the city centre. In practice, only half of the planned area was realised. It is called New Sledderlo (which is next to the historic Old Sledderlo). Over the last few decades this isolated area with about 2,230 inhabitants had to confront several problems: the quality of the social housing is not very good; there is a physical and mental separation between Old and New Sledderlo; there are few public and commercial facilities; there are social problems between the different population groups that are mainly of foreign origin; and there is a high unemployment rate and a low level of education.

The creation of a number of support initiatives (neighbourhood development, youth wellness) has raised the self-supporting capacities of the population somewhat, but the

fundamental issues have not been resolved. Old and New Sledderlo have remained separate worlds and the area cannot really be called a proper city district.

In 2007, the local city authorities and the inhabitants came up with numerous ideas and plans to elevate the quality of life in both areas. A new Turkish mosque has already been realised and a new school and new houses will be built in the near future.

These were good reasons for the city administration to start with the development of a “Master Plan for Sledderlo”. This plan will need to contain the outlines for the future spatial planning within the area within several fields: redefinition of the social housing area, private housing development, public facilities (education, sports, culture, youth, well being), public infrastructure, the development of local commerce, the reinforcement of the economic structure, the relation with the surrounding industry, and the cohabitation of the different populations.

The city administration sees it as essential that the master plan can count on the support of inhabitants and local actors, as they will be the plan’s future users. Inhabitant participation will therefore be of great importance in the realisation of the plan. It also has to have an inviting character to public and private partners.

The future TF can make a great contribution to this planning process by addressing some of the following questions:

How can the general quality of life be improved, socially as well as technically? How should renovated and new houses look like in order to support the social mix of the population structure? How can the communication between the population groups be improved? Which new concepts can be developed for education, sports, youth, culture and wellbeing facilities? How can these services become part of a broader vision on multicultural cohabitation in the future? How can these new concepts be integrated and implemented in other locations with similar problems?

Relevance to companies - What will future classrooms for toddlers and children in primary schools look like? The way that classrooms are organised and furnished, as well as the choice of materials are of importance. This could be a good opportunity for potential suppliers to start working on renewing their products and services. The same opportunity would arise from the potential development sports, youth, culture and wellbeing facilities, or the renovation or construction of houses. Also the external surroundings are important when it comes to improving quality of life; think about park furniture, waiting areas for public transport, wireless communication, etc.

Relevance to government and semi-public organisations – It is clear that the city administration and the social housing organisations would benefit from the master plan being successful with the inhabitants and the local actors. The participatory approach is a crucial method to involve the future end-users in the whole realisation process. The local administration has a chance to create a maximum level of involvement in the development of the master plan. The TF can gather a multidisciplinary group of specialists, who will, together with the end-users, turn concepts into prototypes that they can experience – an approach of strong innovative value.

Relevance to schools and universities - The master plan is not a fictional “what if” project but provides a real “on the ground” opportunity for students who are in their last year or graduated recently to obtain professional experience and establish a link with the reality of the everyday professional world. In this setting, project proposals can be tested on their usefulness. Collaboration between educational institutions, students, recently graduated students and companies offers many opportunities for creativity and innovation.

Relevance to designers - The master plan will not only be focussing on the here and now, but also on the more distant future. That is why it is of importance to work with talented designers with a broad vision and an eye for national and international approaches and methods. Working under the guidance of experts who act as mentors, will be a tool to achieve that. The realised concepts, products or services will serve as touchstones. For the designers it is an ideal opportunity to show them selves to the world and to be able to create opportunities for their own professional development and career.

Wellbeing – Project: The Hospital of the Future

The European population is ageing dramatically and healthcare is shifting from providing acute treatment to becoming a service provider for the chronically ill. Internationally, design engage in service design approaches that are increasingly relevant for the healthcare sector.

ZOL (Hospital of East-Limburg) is one of the most progressive and future oriented hospitals in Flanders. Recently ZOL stated that the hiring of a hospital futurologist would be a likely next step. This futurologist could possibly work within the Transformation Factory. Hospitals need to continuously decide about investments for medical equipment, or the furnishing of hospitalisation rooms, waiting rooms and examination areas etc. Often this involves substantial amounts of money and decisions will have an impact for decades.

The decision makers are often the hospital authorities themselves, in collaboration with their financers (the government) and their suppliers (companies). This context does not always lead to innovative thinking. Governments would like to save money, companies want to sell their existing products and the hospital authorities have the tendency to envision the hospital of the future as a “more modern” version of their current hospital.

A project regarding the hospital of the future can be an enormous opportunity for innovative thinking and the development of new services and products.

What does it mean concretely to have to imagine a hospital of the future that will mainly treat chronically ill patients? What is in fact the future of the hospital? How are the needs and expectations of the people going to evolve? And how will we have to organise the hospital to meet those needs and expectations? How can we involve patients and relatives in the creation of a healthcare system that is of relevance to them? And how does such a hospital fit within a broader vision on healthcare?

Relevance to companies - Hospitals are dependent on numerous suppliers: architects, contractors, manufacturers of medial devices and products, producers of furniture, suppliers of food, hygienic facilities and cleaning companies – just to name a few examples. What does this new definition of a hospital mean to these companies? How can they help create a constructive vision about the hospital of the future? How can a multi-disciplinary, collective and experimental process to create a vision of the hospital of the future become a win-win for both companies and the hospital itself, thus benefiting them for many years to come?

Relevance to governments and semi-public organisations - How can a hospital transcend a way of thinking that is determined by a conventional vision of what a hospital is supposed to be, or by the restrictions set by too strict a financial target? Fresh and innovative ideas emerge by assembling a multidisciplinary team that does not immediately start its thinking from existing structures, or wants to apply a financial or product-focussed style of reasoning. Such a team has to be led by a progressive and open management team, such as that of the ZOL (Ziekenhuis Oost-Limburg), and should be guided by a number of strongly motivated government mentors.

Relevance to schools and universities - Schools seldom collaborate with hospitals and universities often only conduct basic research there – usually outside of Limburg. A university can approach this “hospital of the future” project as a research project with a practical relevance that will prepare students for a concrete labour market. A strong, progressive project can also lift these institutions to a higher international level.

Relevance to designers - Designers seldom get the opportunity to work directly on projects related to healthcare or hospitals. Still, their human-focussed way of thinking can contribute in a very unique and valuable manner. An in-depth project experience can help set professional designers on the right track, and demonstrate the possibilities of design thinking to student designers.

5. Next steps

The City of Genk has recently assigned the Experientia team involved in the visioning to also set up the structure legally, organisationally and financially.

In addition, the Cities of Genk (in the East of Flanders, near Maastricht/Eindhoven) and Kortrijk (in the West, near Lille) are currently in the process of developing a project proposal to obtain Flemish and European funding to stimulate entrepreneurship in their local economies and in the surrounding regions of Limburg and West-Flanders, based on a strong design driven approach. The Limburg part of the project would be the launching project activity for the Transformation Factory.

6. Conclusions

The design visioning process that we described above have led to a new definition of a “design centre” that achieves on-the-ground transformation through concrete projects, guided by six core principles: project based activities, thematic structure, multidisciplinary approach, radical choice for end-user, company focussed commitment, and research based analysis.

Design and user research was the founding basis for the vision of the Transformation Factory. The needs of the region and the people who live and work there came first in the vision development and also in the themes around which the TF will end up working. The core objective of the Transformation Factory is in essence to bring about concrete social and economical change in the region through the application of research and design in the broadest sense.

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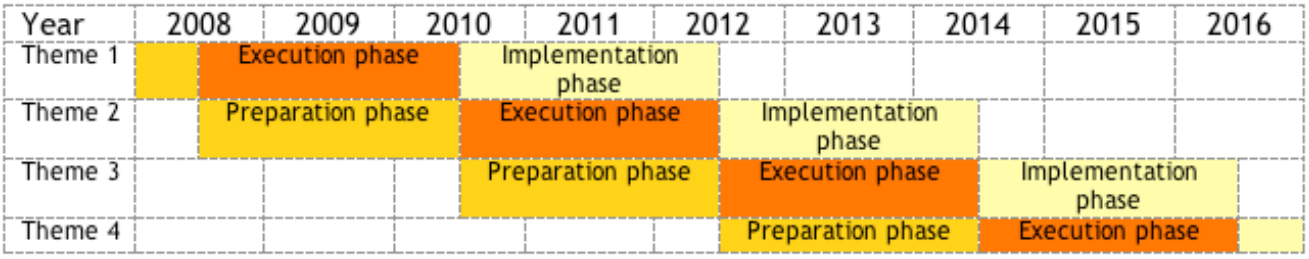

Fig. 1: Thematic project structure

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Our House:

Interior Design and Sustainable Consumption

Gabriela Varanda de Castro[1]

Abstract

Brazil's social and economic context involves some issues that could be considered contradictions: conservation and economic progress, technology and tradition, industrial and huge natural areas.

Brazilian sustainable design also reflects these expectations, searching for contemporary solutions, but also using local resources and skills to keep some traditions alive.

Nevertheless, the social learning process, which conducts Brazilian designers towards a constructive critical attitude able to reach sustainable society, is not an isolate one, but also a collective process that encloses the views of those who acquire products.

This paper presents insights from a research project that examines the notion of responsible consumption, and its implications for interior design in Brazil. Quantitative and qualitative methodologies were used to investigate Brazilian consumers' behaviour and expectations.

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1. Introduction

Sustainability seems to be the watchword for society of today. Therefore, we are everyday bombarded by news from newspapers, magazines, television channels and Internet vehicles, which address this issue.

Despite looking simple, the concept of sustainability is complex and has been understood from different points of view, by different researchers. One of the most complete definitions is the one given by Ignacy Sachs. For the author, it is necessary to consider, simultaneously, five dimensions, for a complete apprehension of its meaning (Sachs 1993):

- Social sustainability: improves the rights and living conditions of populations and reduces gaps in social groups living standards;
- Economic sustainability: makes feasible the efficient allocation and management of resources, evaluated much more under macro-social than micro-business criteria, and by regular streams of private and public investments;
- Environmental sustainability: involves attitudes to reduce resources consumption and waste production, to intensify research and the introduction of cleaner technologies and to establish rules that permit an adequate environmental protection;
- Spatial sustainability: contemplates a more balanced configuration of rural and urban issues and a better distribution of territory, involving, among other concerns, the excessive occupation of metropolitan areas;
- Cultural sustainability: searchs native conceptions inside each culture, respecting the peculiarities of each ecosystem, of each culture and of each locality.

Nevertheless, in which manner the sustainability concept is embedded in a design product? And how sustainable value is perceived in furniture and decorative objects, from the perspective of consumption?

This article investigates the way sustainable value is assessed by furniture and decorative objects consumers, showing results from a poll taken among customers from three interior design stores in Rio de Janeiro. This research includes a conjoint analysis – a statistical technique used in market research to determine how people evaluate different features of an individual product or service – and a qualitative interview, that determinates people's expectation and impressions about the relationship between products, design and sustainability. In addition, this article analyses the notion of responsible consumption and its implications for design in Brazil.

2. Sustanaible Design and Consumption

Accordding to Mary Douglas and Baron Isherwood, each person is a source and an object of judgments, each person is in the classification process whose discriminations are helping to establish. The flow of consumption goods leaves a sediment that constructs the culture structure as chorale islands (Douglas and Isherwood 2004, 119-147).

Therefore, consumption goods are an instance of the material culture. As other types of material culture, they allow the public and visual discrimination of cultural specific categories, codifying them into a set of material distinctions through the goods (McCracken 1991). Bourdieu also thought that goods join and classify groups. For the sociologist, they are elements that establish lifestyles. Economic exchanges are symbolic ones (Bourdieu 2001).

The consumption culture uses images, signs and symbolic goods to evocate dreams, desires and fancies that suggest authenticity. The new heroes of consumption culture transform the style into a life project and reveal its individuality and sense of style in a set of goods, clothes, experiences, appearance and corporal disposals intended to compose this exact lifestyle (Featherstone 1995).

The creation and the production of consumption goods – and dreams, desires, fancies and lifestyles – are close to design activities. To consume a product is also to consume its design and the previous intentions that originated it. But what is the role of the designer in this symbolic trade? Design is, in last analysis, a process to embed meanings into the objects (Denis 1998, 24-30).

Branzi also believes in a neo-primitive design approach. For the author, designers pursue the construction of an identity, of a language, acting as the old tribal chiefs. The tribalization of the cultural society, with its cultural groups or tribes and its specific consumption goods, is the result of this neo-primitive condition (Branzi 1989, 38-39).

Curiously, in his article *The idea of comfort,* the Argentine philosopher Tomás Maldonado asserts that we only decide the organization and the position of the domestic objects in the microenvironment of our houses, where we stamp our perceptions related to these products. If in the exterior world we remain in a blasé attitude, perceiving but not apprehending the demand around us, in our houses, this small segment of the huge material culture society, we have real autonomy and an actual relationship with close objects (Maldonado 1995, 256).

It is in this context, in respect to environmental and social questions, that sustainable design appears as a new proposal for contemporary design.

Design has to be responsible in terms of the ecology and the society. And also has to be revolutionary and radical. It must be dedicated to the principle of the minimum effort of the nature, in other words: A minimum inventory guided to the maximum diversity (Papanek 1985).

Therefore, considering sustainable concept, what is the collective code that categorizes sustainable products and services, allowing sustainable value consumption?

In other words, what is the symbolic meaning of embedding sustainable value into a product?

To embed sustainable value into design product is to show its origin clearly, to tell its history, to inform on its use, to satisfy a real necessity and to collaborate with global economic and social development, allowing consumers/users (who really choose and legitimise a product) to identify and share this new cultural proposal (Castro 2007a, Castro 2007b).

As we know, it is part of design job to create symbolic goods to evocate desires, fancies and dreams. And sustainable products and services are symbols of a new lifestyle to be fully achieved.

3. The Research

This study was conducted among a group of thirty furniture and decorative objects consumers, from three well-known stores in the city of Rio de Janeiro.

The Elementos da Terra store, located in Copacabana district, offers a selection of crafts produced by designers at NGOs (non-governmental organizations) and cooperative associations, from different regions of Brazil. The store has products manufactured with natural fibres, wood from demolition and other natural raw materials.

Fernando Jaeger´s showroom, in Jardim Botânico district, offers, specially, wood furniture and accessories for decoration. Fernando Jaeger is a designer who uses certified and alternative wood in his projects. He is one of the furniture designer pioneers in the development of products with low environmental impact in Brazil.

Daqui Design is a small store in Leblon district, dedicated exclusively to the contemporary national design. It brings together many of the Brazilian newest design names.

The selection of the interviewed customers was defined by non-probabilistic sampling, to achieve information in a quick and low-cost way, due to time and budget limitations. The used criterion was to interview clients who attended the stores as eventual or potential customers, or assiduous clients indicated by the shops owners.

As part of research, two surveys were prepared, a qualitative, made up of a separate interview in depth, and other quantitative, using the conjoint analysis technique.

The in-depth interview allows the collection of data and opinions, interests, perceptions and attitudes faced with the central subject of the research: the perception of sustainable value in interior decoration products. A pre-determined script in an interview form was established without exposing initially the central issue that was being investigated, avoiding induced responses by the persons interviewed.

In addition, in the interview script, visual stimuli was included with products offered by the stores, for an assessment of aesthetic perception of the sustainable value in design products.

The quantitative research used the conjoint analysis technique. According to Malhotra and Birks, if you choose this technique, you should identify the relevant attributes, to determine their levels, define the attributes combination to be used, choose the presentation form of stimuli and select the approach of the analysis. The attributes must be relevant to influence consumer's preference and choice (Malhotra and Birks 1995, 554-557).

According to Malhotra and Birks, attributes are characteristics that describe a product or a service, i.e., what a consumer evaluate at consumption act. In the conjoint analysis, the respondent is asked to make a choice: to select attributes that overlap each other, in a situation very close to the purchase scenario, when the consumer is forced to consider all these characteristics at the same time.

To reach the definition of which attributes were relevant to the research, it was used, as a secondary source, the Planeta Casa Prize, which is held annually by Casa Claudia magazine, a Editora Abril's publication (Azevedo 2007).

The Planeta Casa Prize is an event that recognizes sustainable initiatives in design, architecture and decoration fields, rewarding the winners in the following categories: Product, Construction Material, Social Action, Architectural Design, Interior Design, Student and Real Estate Venture.

The poll attributes were defined and gathered on cards, from an analysis of the furniture and decorative objects winners in the category Product, in the last five editions of the Planeta Casa Prize.

The four attributes, and their respective levels, were defined as follows:

1) Material:

- Recycled, renewable or recyclable: A material that was reused from another product, was made with renewable resources or can be reused in new products.
- New or non-reusable: Materials which are virgin or cannot be reused in new products.

2) Aesthetic:

- Rustic style: It uses natural fibres, rough wood, it has a straight relation with nature.
- Contemporary style: It follows present trends, it is modern and urban.

3) Way of Production:

- Craft: One that was created manually, by craftsmen from various regions of Brazil.

- Craft with signed design: One that was created manually by craftsmen from various regions of Brazil, with the guidance from a designer.
- Industrial: One that was produced industrially.
- Industrial with signed design: One that was produced industrially, with the signature of a designer.

4) Price:

- Low ($): In offering, in promotion.
- Middle ($$): Average market price.
- High ($$$): Above the average market.
- Very high ($$$$): A lot above the average market.

Since that there were four attributes (two of them with two levels, and the other two, with four levels), the total number of combinations would be 64 (2x2x4x4). This number would make the task very costly.

According to Curry, the minimum cards number with attributes combination is given by: minimum cards number = attributes levels total number - attributes total number + 1 (Curry 1997).

Using the previous formula, the minimum cards number would be nine. But, considering that the recommendation is to use about 1.5 to 2 times the minimum cards number, it was decided to use 16 cards.

4. Results

It was verified that 87% of the interviewees were women and 13% were men, once decoration consumers are predominantly female.

Most of the consumers researched has age between 26 and 54 years and family incomes exceeding 3,000 reais (the minimum salary is 415 reais in Brazil), and more than 77% present a complete graduate or post-graduate level of education.

The qualitative research analysis also found that, for those consumers, ecological products are those that:

"... are *made with recycled material, are reusable, have non-industrialized appearance, are crafts, simple and cheap.*" (interviewee 1 - Elementos da Terra)

"…are made with material extracted directly from nature, such as fibres, straws, leaves, more rustic woods." (interviewee 7 - Elementos da Terra)

"... *come from rehandled forests, with supervisory control, from planted forests. They have fabrics that do not depreciate the nature*." (interviewee 10 - Fernando Jaeger)

"... *are made with recycled or recyclable materials, from reforestation woods, they contain non-aggressive materials to the environment*." (interviewee 12 - Fernando Jaeger)

"... *come from the nature, don't destroy the planet*." (interviewee 20 - Daqui)

"... *come from the nature without its degradation, such as authorized wood and paper*." (interviewee 21 - Daqui)

As regards to products that carry a social value (they are socially responsible), it was found that they are those:

"... *that pay craftsmen in a decent way, come from fair trade, are recyclable, you can know the origin of its material*." (interviewee 1 - Elementos da Terra)

"... *who value, above all, the work of a craftsman*." (interviewee 8 - Elementos da Terra)

"... *produced in an environment of fair work, with the labour laws of the country being met, with good working conditions, without exploitation of workforce*." (interviewee 10 - Fernando Jaeger)

"... *made from recycled materials, usually considered 'trash', by cooperatives that help to create jobs for the people of low income*." (interviewee 16 - Fernando Jaeger)

"... *produced by companies who are concerned about the type of workforce employed, about the qualification of the staff members*." (interviewee 21 - Daqui)

"... *that do not attack the nature, as indigenous products*." (interviewee 28 - Daqui)

These assertions were further supplemented by the visual perception of products with social and environmental value, selected by customers from the three stores (Figure 1).

Using an Excel application, the conjoint analysis showed that among the four attributes evaluated (material, aesthetic, way of production and price), the decoration shopper was more sensitive to the way of production (Figure 2). The conjoint analysis also generated comparative charts for the levels of each one of the attributes.

When analysing the levels of the "way of production" attribute, that one with greater weight, it was realized that the "craft with signed design" level is the most quoted, followed by "industrial with signed design" one (Figure 3), which confirms the appreciation of the designer work. But this observation also points to another direction: the sum of the results of "craft" and "craft with signed design" levels shows that the crafts production is very relevant at purchase.

The "price" was the second attribute with greater weight, since a low or medium cost has superior importance faced with the quality or origin of the material used. The recycled, renewable or recycled materials were preferred to new or non-reused ones. As regards to "aesthetic", the attribute with lesser weight, the "contemporary" style was positioned before the "rustic" one.

5- Craftsmanship and Natural Materials

The importance of the "way of production" attribute in the research carried out helps us to understand the weight given to the designer's work and its association with the crafts production. Handicrafts, undoubtedly, go through a time of valorization in the Brazilian decoration market.

However, it is the social matrix that is given to craftsmanship as seen in the qualitative poll which interests us in this study. The recognition of the craftsmen work, the perspective of a better income distribution, the recovery of regional techniques and cultures, the development of urban and rural areas, all of these contributions are part of the greater sense of the sustainability concept, as defined by Sachs (Sachs 1993).

In the Brazilian context, sustainable strategy based on the pyramid base approach, as suggested by Prahalad and Hart (Andersen and Tukker 2006, 383-384), is a very interesting alternative: the rethinking of poverty as an attractive opportunity for growth, generating income and satisfying the basic human needs of certain populations. In this case, the social dimension is more important than the environmental one (UNEP 2006).

The tradition of a place may, after all, survive in a globalised world, and a sustainable design product should carry this possibility (Manzini 2007). The anthropologist Nestor Garcia Canclini brilliantly defines this moment in his book *Culturas Híbridas* (Canclini 2003).

According to Canclini, the modern development (or contemporary development) does not suppress the popular cultures. We live a hybrid culture, where craftsmanship has a complex interaction with modernity, renewing its work, but also respecting certain traditions. The increase of craftsmanship in industrialized countries shows that economic progress does not necessarily mean the elimination of productive forces that do not serve for its expansion. The reproduction of the traditions does not require being unaware of modernisation.

Another interesting observation is that not only the craftsmanship adhered to the rules of modernity, but the inclusion of crafts by industry also points to a double road. It is very common to see designers appealing to crafts techniques to add quality and exclusiveness to his pieces, mainly in the fashion and the decoration market, which also influences the crafts production.

For some, the reminiscence of craftsmanship is often a romantic desire to rescue another time, another era, when the artist was local and the world was summarized to his town, still far from a small globe, imposed by mercantilist practices. The recovery of the crafts could be seen as a search for identity, a safe harbour, in the frenzy of contemporary life.

The existence of new projects for the countries and the consequent change of its economic and cultural role has changed its place in the social relationships, in the definition of national identities and their own identity as objects. But you cannot say that the modernisation trend is simply to cause the disappearance of traditional cultures. The re-elaboration of traditions could be a source of both economic prosperity and strong symbolic affirmation of their identity:

Being the sum of functionality and beauty, a craft object can return us to the lost synthesis. It equals not exactly to the opposition of an era to another, but the reaffirmation of the basic needs of human beings, which, actually, leads to a re-identification, a review not only as a being able to make multiple things, but as a person ‘belonged' – not rootless, but included in an own and proper system (Ribeiro 1983).

Therefore, the crafts production lets to the roots, both for those who makes and for those who purchase them. According to the anthropologist Antonio Arantes, in this search for cultural value in crafts production, however, we must accept some demands, to meet the premises of sustainability (Lages et al. 2004, 124-126):

- Singularity: The aggregated differentials must be effectively rooted in local cultures and be recognized as significant differences, both by producers and externally, fighting forgeries production and shop window identities induction.
- Traceability: The safeguarding of links between products, producers and territories makes possible the consumer contact with the social and cultural environment of the original product, which is essential to build the credibility of the cultural value aggregated.
- Quality: The development of technical and material conditions of production, as well as the upgrading of products which are created for external consumption, should respect the producers’ cultural arrangements and their social organization.

Finally, the "aesthetics of nature". Such as in sustainable architecture, which shows on its "skin", for example, green roofs, it is reasonable that somewhat similar is expected from a sustainable interior design product, "one that recalls the nature", as observed in the qualitative research. For some persons, sustainable products are those made with natural materials (at Elementos da Terra and Daqui stores), and for others, those created with natural materials and with an appropriate origin (at Fernando Jaeger’s showroom). It is also interesting to note that there is room for the contemporary style, even within the "aesthetics of nature", since this is not associated, necessarily, to the rustic style.

Therefore, the great opportunity for sustainable interior design in Brazil is to merge the concepts of "nature", "tradition and place", and also the concept of "social innovation", in a new aesthetic approach of desirable products, which promise changes.

6- Conclusions

No artefact survives without culture, without being significant for those that conceive and utilize them. This sense has probably been the product design original point of interest, as designers promote the relationship between people and the material world, seeking to adhere particular meanings to their projects, and suggesting new models for the future (Margolin 2007, 4).

The knowledge of the meanings of an object can be built from some categories. Some of them are related to the user context, where he is inserted: their motivations, emotional aspects related to the use of the object, the characteristics of this user, the contribution of the object in the explanation of the identity of its owner, how this object serves as social communicator, the role of this object as an element of discrimination, social integration or ordination.

In current days, the word aesthetic is no more exclusively linked to the idea of good taste and beauty. Our aesthetic perception is relative and dependent on our cultural system, and there resides the important of the cultural factors or the functions of the products. The way we see and feel depends on our habits, our knowledge, i.e., on our life in our society.

The inherent product characteristics involve the materials, the technologies and the costs related to the product manufacture, which can also apply significant changes into the product image, as they concern to the production.

However, the extrinsic characteristics, which include the emotional, social and cultural, semantic, symbolic and aesthetic aspects of the product, have vital importance in regard to the product image faced with the consumer/user.

The products don’t exist outside the human involvement, because we do not react barely to their forms and functions. The fate of an artefact is not determined solely by its aesthetic and functional qualities. It is believed that the search for an identity of the Brazilian design cannot be exclusively anchored on physical aspects but also on symbolic ones, which allow Brazilians to recognise themselves. After all, the idea that people's behaviour play a vital role in moving towards sustainable development (Jackson 2004; UNEP et al. 2005).

In this search for the sustainability visual language, Brazilian designers create products using traditional skills and materials, exploring local resources, forging a connection with their client's customers or communities and elaborating a design proposal that can be locally recognized and useful in the Brazilian society transformation. It is precisely this union between craftsmanship and design that best communicates this Brazilian proposal: by the ideas of "nature", "tradition and place" and even by the concept of "social innovation".

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Flor do Cerrado ring

"*Made with natural fibres, non-polluter*"

interviewee 7

Elementos da Terra store

Fulô luminary, handmade dome and metal

"*Coopa-Roca, is from Rocinha.*"

interviewee 14

Fernando Jaeger showroom

Quadri chair, certified wood

"*Rustic wood or reused one.*"

interviewee 21

Daqui store

Fig. 1: Products with social and environmental value, selected by customers from the three stores.

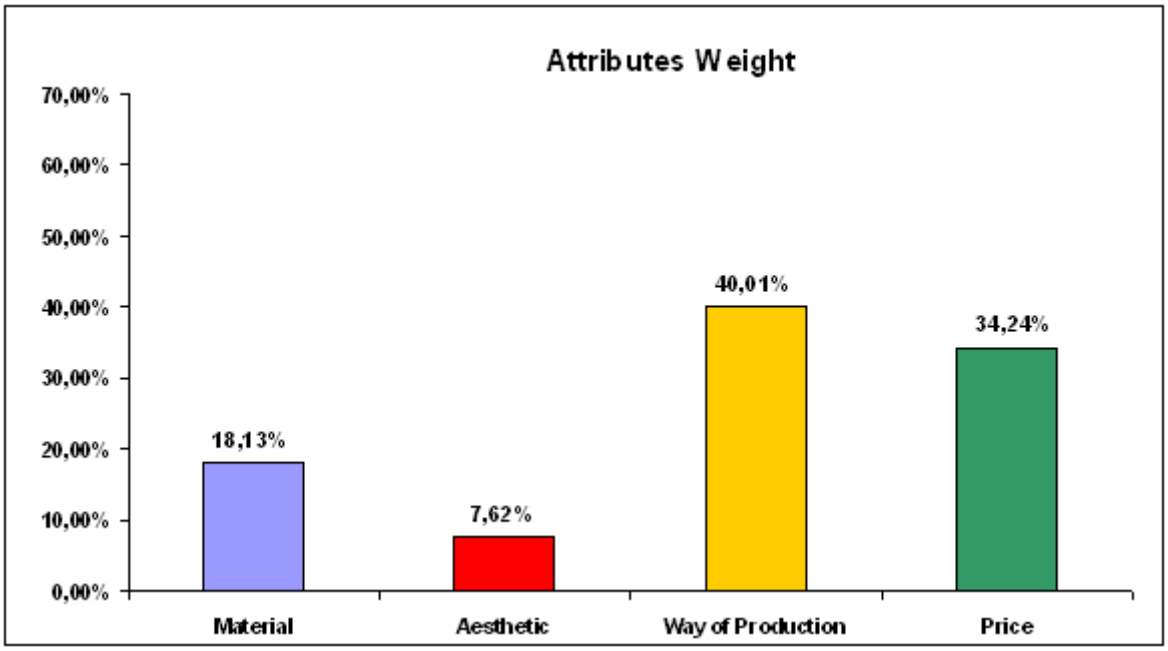

Fig. 2: The conjoint analysis: Relative weight among the four attributes evaluated.

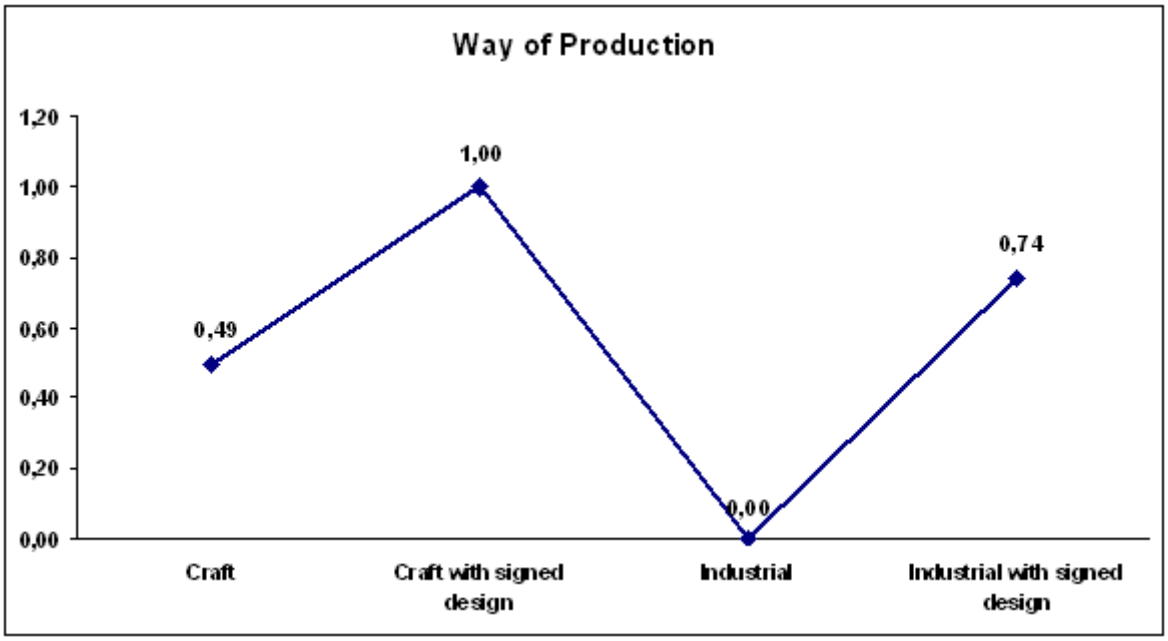

Fig. 3: Relative weight chart of “way of production” levels, on a 0 to 1 scale.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Knowledge Communities

The actions of design for the construction of knowledge-based territorial systems

Rosanna Veneziano[1]

Abstract

This paper intends to describe a planning methodology for the strategic and services design to put in evidence the importance of sharing strategies to increase the territorial development and the participation of local communities on the project process.

In complex territorial systems where universities and research institutes create and spread knowledge, the link with the geographic site is very important.

In this context, thanks to the strong integration between local communities and universities, it is possible give birth to the “Knowledge Based Communities”, that through an active participation in decisional processes can have a determining role for the territorial development.

This paper presents the case study “*Suniverse. University services system*”, a services design project for the Second University of Naples.

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1. Introduction

The design studies, with its scope of action, have a crucial role in building innovative models for the development of a territory and management of territorial resources.

In the project process, the design is able not only to realize new production scenarios, but to start up a general participation of the community in planning-operating, project and experimentation phases.

The design, through the strong connection with the “environment” in which it operates, analyzes the territorial, social and economic characteristics and develops the material and immaterial aspects. The continuous innovation needs that come from the territory and from the social body, find an answer in different actions and strategies.

On one hand the design contributes to the development and the enhancing of the local resources, on the other hand supports the spread of new cooperation models and initiatives that provide answers to social problem. The design is the tool, particularly in services and strategic area, to develop collaborative services systems. In this system the local communities aren’t only a role of users or end-users but they are producers or co-producers.

Through an action system based on the sustainable approach and projects related to solidarity and exchange, it is possible to address the community towards responsible behaviors. Sharing initiatives, that face and solve a local problem, increase the belonging feeling to a community and activate a relationships system of local capabilities and individual competences.

This type of social participation, spreading shared and self-management services, even develops spontaneous initiatives and is able to transfer more quickly those values essential to change lifestyles and consumption in a sustainability perspective.

Thanks to projects born from community’s creative processes and that start from the bottom, it is possible to share and experiment proposals that act not only on environmental quality of processes and products, tangible and intangible assets, but on the ability to spread a new idea of welfare-oriented sustainability.

In this scenario projects with a strong identity emerge because they born in life contexts in which the results are immediate by “doing”.

The design approach based on the cooperation is continuously adjusted and the final result is verified by communities from where the demand for innovation emerged.

In this context the sustainable approach is a project experimentation process about strongly contextualized needs with an active community participation that express local identity.

For this considerations the design can play a crucial role and can certainly be the mastermind for the development of a territory, offering solutions for the community needs and spreading ethical and social values.

2. Social networking: creative communities and knowledge communities

In the "network society", defined as a social network that spread through the network logic and that is powered by information technology emerge a new form of communication based on horizontal networks of communication (Castells 2007). In this context the distributed systems widespread over time and for different areas. These systems are complex shapes with a strong interconnection but which have their own autonomy.

The distributed systems were considered as possible structures of innovative developing models for a sustainable society. In recent studies they were reported as the infrastructure of the so called *"multi local community," a society based on new ideas on communities and places* (Ezio Manzini, the Ezio Manzini's blog, *From distributed intelligence to distributed economy via distributed energy generation: an emerging distributed model of development?*, paper posted to on October 5, 2005).

In this context the qualities and characteristics of a place, its human and territorial resources must be considered not only at a local scale but also, at a larger scale, as part of a connected system in which each element is a knot in a network.

In the social scenario the relationship between social networks and virtual networks is more and more widespread. In fact through the unlimited connections, the information, ideas, experiences and knowledge are spread.

The more interactions between the knots, the useful is the network: "… the usefulness of the network and its proportional growth is a function of social groups that have access." At the same time the network value is multiplied with the increase of knots that compose the network. The network efficiency is guaranteed by a process of reconfiguration and replacement of those knots that are failing the task of providing value information. (Castells 1996, 70-75).

In recent years through the network communication we see the spread of new models solving common problems or defining complex project on very large scale. Institutions such as Design Council, spirit of creations, since years, activate virtual communities to analyze specific topics to find solutions about social problems.

These practices are based on virtual communities, on connectivity and on the individual participation to solve common problems or discuss specific issues.

The collaborative networks are complex forms of organization in which a group more or less numerous of people exchange information to obtain a result. This type of flexible structure is based on the individual experience of someone sharing ideas with a group of people through peer to peer dynamics. (Manzini and Jegou, 2003).

Another social phenomenon, developed in recent years, is that of the *creative communities*. Those communities, born locally, have a strong and global interaction and participate actively to the design process.

The creative process is born from the need to solve a problem particularly felt at the local level and is concretized with the identification of alternative solutions and new ways of social acting in everyday life.

These self-organized communities experience and solve problems through shared ideas and collaborative models with high social innovation contents. (Ezio Manzini, the Ezio Manzini's blog, *Creative communities, collaborative networks and distributed economies. Promising signals for a sustainable development,* paper posted to on January 6, 2006).

The design capabilities of *creative communities* are activated around an emerging need and they give rise to an interaction system towards new types of social learning. These forms of creative groups are a strong signal that identifies an awareness of a changing towards the sustainability, sharing new ideas of "welfare".

Today there are many creative projects that identify solutions able to respond to the growing demand for lifestyle changing. The problems arise from social services inefficiency or from the need to make best use of local resources or even to promote local know-how.

These communities have faced in a very efficient way problems such as mobility, housing, food, social services, education, work, identifying different and sustainable solutions. (Meroni 2007) The project approaches starting "from bottom" and spreading through social network, through solutions such as car sharing, co-hausing, producer markets, construction of associations for food distribution and sale, of groups coordination to respond to a request of social services.

The design tools used are activated in a contest where the responsibilities and skills of the person are a founding value. In this way the subject is a consumer but also a creator of concept and a co-producer of a service.

Considering that collaborative networks and creative communities are distinct phenomena generated with different intents, and considering that both phenomena are important for social changing, it is clear that, in this context, the *knowledge based communities* have a more important role (Ezio Manzini, the Ezio Manzini's blog, *Creative communities, collaborative networks and distributed economies. Promising signals for a sustainable development,* paper posted to on January 6, 2006).

The *Knowledge Based Communities* develop in places where strong is the interaction between local communities, university research institutes and enterprises. The system of interactions between the territory and the university predispose to the social changing and to new complex relations systems.

In areas whose economies are closely connected to knowledge, the contribution of the *knowledge based community* is fundamental to attract new economies enhancing the territorial and social resources while promoting sustainable development strategies (Thackara 2005, 24-26).

In places where universities and research institutions set up, the so-called knowledge poles, we see the "territory cultural contamination" becoming a more complex system of relations.

The role of knowledge poles in the dissemination of best practice towards the sustainability is to contribute to build connectivity networks between communities, businesses and institutions, and to implement actions and projects with the common objective of respecting cultures and environment.

Universities, defined as "engines of innovation" (Richard Florida, the Richard Florida's web site, *The University and the Creative Economy*, document posted 2006) create important synergies with the actors and the communities in the places where they are active and the surrounding areas. By means of policies oriented to strong links between Universities and the territory and the implementation of diversified strategies, devised together with the local communities, processes can be set up to disseminate knowledge and enhance the development of creative communities, which are a source of innovation and growth for local realities.

It is possible to create a Knowledge based territorial system implementing projects using the landscape potential in the right way and starting from the local field to share the global results. These systems are characterized by strong links with communities participating actively in the design process.

Actions should be addressed to the enhancement of local resources through the exchange, the sharing and dissemination of knowledge and of best practices of territory development. (Thackara and Verwijnen 2004)

3.The territorial resources enhancing: the communities interaction. *Suniverse* case study

The case study explained below, experiment a model of cooperation between knowledge communities and local communities. The services design project is based on the social participation and on the construction of a complex system of relations between public institutions, research institutions and local communities. The services design project promotes the territory development thanks to the of real and virtual network potential.

The Second University of Naples (SUN) has a special organization, because the various faculties are distributed over the territory of Campania. The multi-centre system is build up with the aiming of locating the research centres in the most suitable specific area.

Therefore the SUN appears as a complex system of competences and a place to experiment projects aimed at making the University-territory system more and more competitive.

In the *Suniverse*[2] case study, through strategic and services design the university and the local communities devises an action strategy characterized by a variety of actions to be included in a common program: enhancing local, territorial, landscape and social resources by constructing a global network applied locally and transferring the know-how developed in the university's laboratories all over the territory.

The project aim is to enter the SUN and the linked communities into highly competitive systems, through implementation, in an out-sourcing model, of a services system which uses and promote the already existing skills and resources.

The project provides for the application of an operative methodology oriented to the complete cooperation of public and private stakeholders and to the integration of measures and actions leading to the achievement of tangible and intangible services.

Through different and coordinated services the project activates, on one hand, an intangible services network, which use the same potential of the network, on the other hand, builds welcome places facilitating the meeting between demand and offer and promoting local and cultural activities.

As the *SUNiverse* project is implemented over time, it makes the services available and constructs wider relationships, which are needed for the enhancement of the human and territorial resources and for the development of a *knowledge based community* that is perfectly suited for a global competitiveness scenario.

The project includes six fields of action:

SUN Hospitality, an alternative accommodation service which identifies different levels of accommodation using existing structures on the territory and organizing them into a network;

SUN Mobility, a mobility system which experiments sustainable solutions and encourages the use of collective transport systems;

SUN Café, a gathering place equipped with advanced communication technologies that encourages cultural exchange and hosts the collateral scientific activities of the university;

SUN Lab, a virtual environment dedicated to communication of labs research activity;

SUN Card, an tool to access the project services;

SUN Agency, a physical place, located in the university areas, that welcomes users and promotes activities and their services.

The institutions and communities involvement is particularly significant as part of a project to hospitality and mobility.

SUN Hospitality aims to build a network valorizing, at different levels, the hosting structures in any faculties municipality. The network enhances local resources and also encourages the housing sharing by a system of exchange between students and the aged persons.

The objective is to internationalize University activities, and to increase the number of users in extra regional areas. It is necessary to ask an immediate reply in terms of hospitality to propose the implementation of alternative and sustainable strategies going beyond the economic difficulties related to the building of new structures.

The obstacle that strongly influence the spread of initiatives and the international experience is determined, on one hand, by the inability to adapt university building in an accomodation structure in short terms. On the other hand, the obstacle is determined by the small economic

[2] Research Team: Patrizia Ranzo Team leader, Rosanna Veneziano, Migliaccio Davide, Chiara Taddia, Patrizia Silvestri, Ivan De Francesco.

funds available to build new hosting structures. The increase of housing needs, for short and medium periods, the growth in demand by offsite students and the dissemination of international projects, make very important to carry on a plan about hospitality.

The hosting service experiences a different type of hospitality at various reception levels and quality indicators. From the analysis about the housing supply and demand the project chose to follow what was already done in other Italian cities (communities low) encouraging forms of shared housing, low cost or even free of charge accomodation, among people of different generations.

The first level, *Indoor Services*, includes rental services, and a selection of hosting resources in the territory (hotels, bed and breakfast, residences, farms, houses to rent for students and host family). The first level allows the construction of a network with an on-line access. A specific site section, a blog, will be used to collect hospitality demand and supply at low cost or free, exchanging domestic partnerships. The project involves the development of a *SUN Hospitality* quality mark, granted to the structures included in the hospitality network. The mark includes all those residences with high levels of quality promoting local development starting from small businesses. It is also planned to conclude agreements with institutional bodies to cut the rental costs and to spread initiatives of shared accommodation.

The second level, *Personal Services*, includes services related to the person about health, fun and spare time. It gives useful information about hospitals, medical site, chemist's, theaters, cinemas, sports facilities and also promotes events at interesting prices.

The third level, *Outdoor Services*, includes services about meeting the territory, with on-line tourist itineraries, promotion of agri-food experiences and cultural events.

SUN Mobility is an action aimed at achieving a network for the optimization of private transport and for the easing of traffic on the roads of the university municipalities. Every day about 28 thousand users SUN move from different part of the region, with unsustainable travels because of the inefficient public transport service. Consequently, it is necessary to implement optimization strategies of travelling.

The service gives awareness to sustainable solutions and encourage the use of collective transport systems. In particular, the first actions of the project are the optimization of trade by different means of transport (train-bus), the introduction of collective mobility system such car-pooling and car-sharing, bike-pooling with deposit stations and also the creation of a customer service.

By the agreements among the University, the municipalities, the public institutions and the private partners, the *easy parking* service will be activated. It is a low cost parking service for SUN users travelling together in one car. The aim is to promote the use of private cars, reducing the number and therefore the demand of parking space.

By using a software it will be possible to send the request of sharing car to a server that will dispatch the requests and will send by e-mail or sms the travel offers.

In this case study the relations about the service are an essential element for the project goal. The construction of complex social relationship promote an active involvement of users and spread choices and shared values.

Knowing the area in which the services are developed, enable a continuous service adjustment; in this way the service implements its performance adapting itself to the needs of its users.

4. Conclusion

The design actions, in the field of design services, are able to build a interaction system between the productive texture and territory. So the design activities concur to define a

cooperative process of production that is oriented to the development of places with low resources.

The dissemination of design services, that support the integration of knowledge communities and local communities aims to collect the following results:

- activating a communication between research institutes and manufacturers that recognize the research as a point of reference for the development of the territory;
- adding human and territorial resources value meeting cultural and productive activities on the territory;
- developing the *Knowledge based territorial* system.

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Fig. 1: *Suniverse* home page

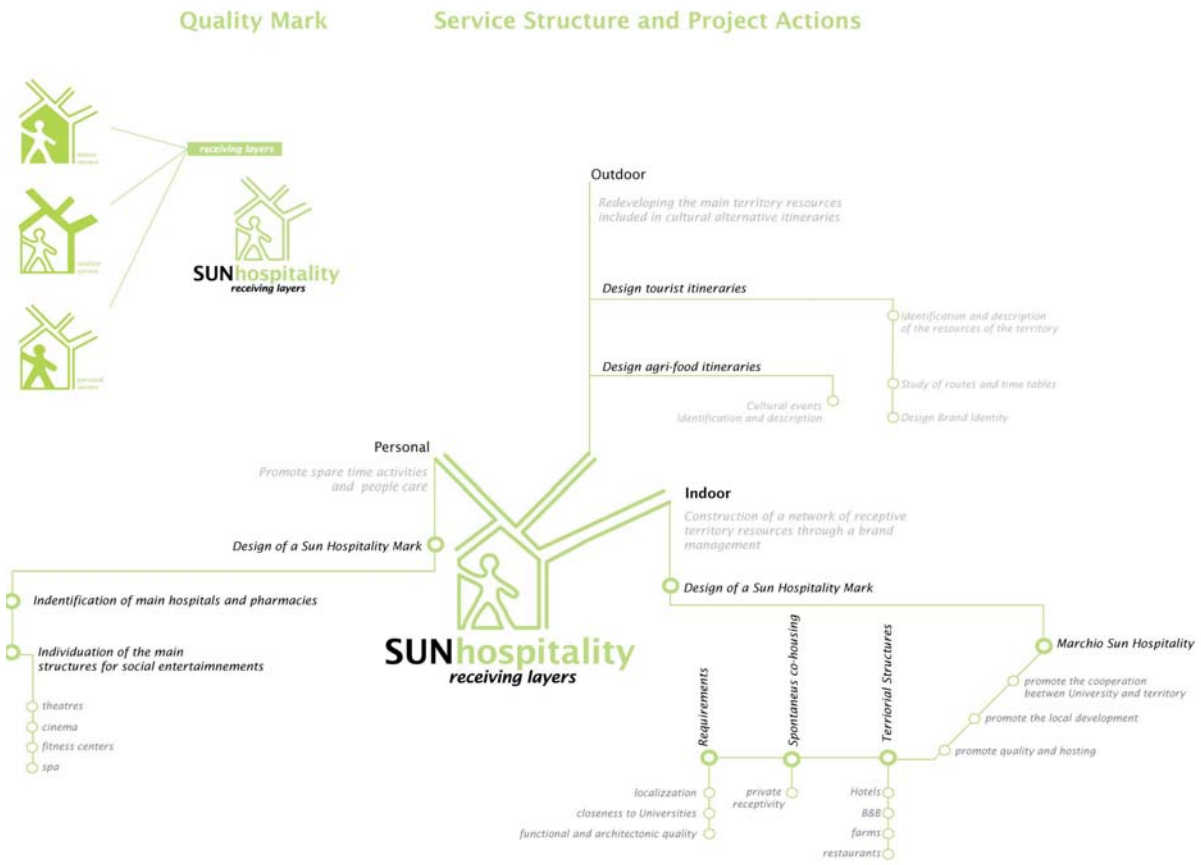

Fig. 2: Sun Hospitality: Service Structure and Project Actions

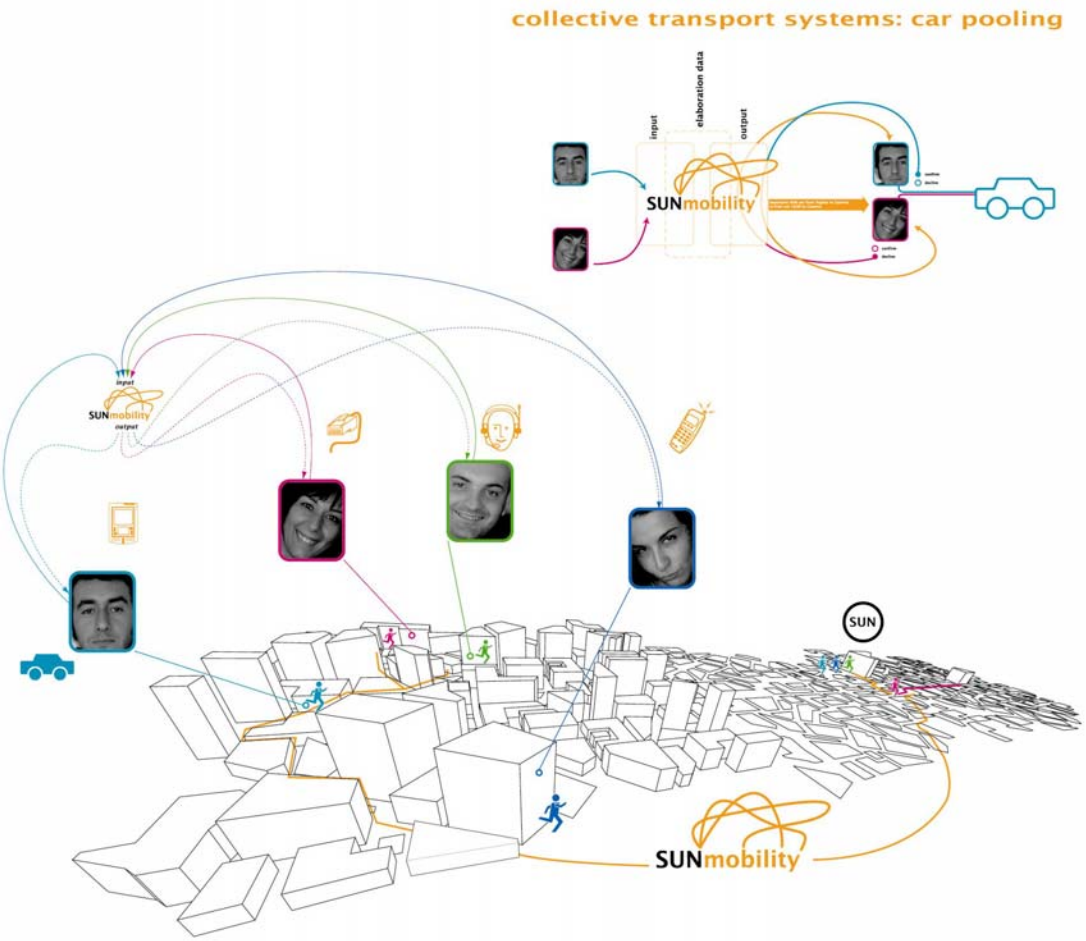

Fig. 3: Sun Mobility: Collective transport system

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

From sustenance to sustainable living in India

Elements of vision based on collaboration with local NGOs.

D'Silva Sabina[1] and Jégou François[2]

Abstract

The research *'From Sustenance to Sustainable Living'* explored possibilities of moving from means of sustenance, revitalizing traditional social structures and consolidating existing forms of services to foster the development of sustainable lifestyles in the communities that Indian NGO's are currently working in. The paper discuss different established or emerging initiatives, how they could be improved, diffused and made viable in the long term. It is the combined result of a series of interviews, seminars[3] and workshops[4] that were undertaken in India, in collaboration with Indian NGO's, between 2006 and 2008.

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[2] Strategic Design Scenarios, Brussels, francois.jegou@solutioning-design.net
[3] a collection of promising cases, interviews with local experts and a expert seminar with local NGO's have been conducted within the Creative Communities for Sustainable Lifestyles project. CCSL is supported by the Swedish Ministry for Sustainable Development in the framework of the Task Force on Sustainable Lifestyles within the 10 Year Framework of Programmes on Sustainable Consumption and Production, usually called Marrakech Process.
[4] workshops with representative of local NGO's have been held during the 'All India NGO Summit' held at the Art of Living International Centre in Bangalore from January 31 to February 03, 2008

1. Introduction

Indians are at the crossroads of a big change in their way of living. Economic liberalisation, a large pool of young and educated workforce and a middle class consumer base of 300 million, has propelled rapid economic growth in the country. However this growth tends to be concentrated in its cities. Cities are growing uncontrollably and are in the throngs of infrastructure development with new mall construction, mass-transit infrastructure, condominium housing complexes, attracting more migrants from the rural areas, with people changing their lifestyle from more traditional and sustainable to Western-inspired consumerism. On the other hand rural populaces, which constitute nearly 70 percent of Indian total population, are still struggling for basic essentials of survival, reaping little or no benefits of economic liberalization or the consumer society. In both urban and rural situations, NGO's are acting on the field, since a long while, helping to counterbalance endemic extreme poverty as well as new effects of booming urbanisation and uncontrolled economic growth.

The main objective of the research was to examine how to move from more *'transitional solutions'* to more *'sustainable ones'* in the various communities.

For different dimensions of daily life activities, examples will be described and analysed in the paper. It will show which solutions are more than 'transitory sustenance' and have a potential to diffuse to the larger share of the population and across social layers and shift the on-going trends toward consumerism and unsustainability.

The overall factors that contribute to certain solutions being accepted more readily than others in this context will also be examined, be it cultural, traditional or social norms, economic factors and availability of existing service infrastructure.

This paper has been developed from various research projects conducted in the area of sustainable living:

1_SEP and the activity of collecting/documenting social initiatives promising in terms of sustainability to enrich a 'catalog of cases' towards sustainable lifestyles. SEP is a part of a research study called EMUDE; EMUDE (Emerging User Demands for Sustainable Solutions) is a programme of activities funded by the European Commission, the aim of which is to explore the potential of social innovation as a driver for technological and production innovation, in view of sustainability. To this end it seeks to shed more light on cases where subjects and communities use existing resources in an original way to bring about system innovation. From here, it intends to pinpoint the demand for products, services and solutions that such cases and communities express, and point to research lines that could lead to improved efficiency, accessibility and diffusion. Emude has been promoted and developed by a Consortium of European universities and research centres. In order to identify a collection of promising cases it has set up a network of observers, known as Antennas, encompassing teams of researchers and students from 8 European design schools.

2_The activitiy of researching/compairing/discussing cases in India through the CCSL Indian Programme. The Creative Communities for Sustainable Lifestyles (CCSL) is an on-going project of research that deals with creativity and sustainable lifestyles. More precisely, it discusses the potentialities of collaborative everyday life creativity (the creative communities) in generating and diffusing new and more sustainable ways of living in the urban environments of the emerging countries (with a focus on Brazil, India and China). Examples of these creative communities initiatives are: self-managed services for the care of children and the elderly; new forms of exchange and mutual help; alternative mobility systems; socialising initiatives to bring cities to life; networks linking consumers directly with producers, etc. The CCSL India exercise was held in September 2008.

3_The CCSL presentation at the All India NGO Summit Sangam held in January 2008 in Bangalore, India. The presentation was held in 2 sessions, urban and rural, each comprising 25 to 30 NGOs from different parts of the country.

The approach adopted was to present and share cases on sustainable living from around the world, focussing on cases relevant to the Indian context. The focus here was to dilute the specific context of each case, especially global cases, and make them more relevant to the context. Cases were selected in different areas of everyday living, namely neigbourhood care, new food networks, childcare and mobility. Each case was represented by four pictures in an A3 size poster, with the main service ideas being highlighted in text. The people in the drawings were lined in pencil, to make them appear more ‘generic’ and 'readable' by an Indian audience. The audience was introduced to these cases and asked ‘how relevant they were in the Indian context’, ‘if they existed..in what format’, and ‘if they didn’t…why not’.

2. Beyond transitory solutions...

The main concept that this section would like to demonstrate is the notions of 'transitory' solutions: for instance the traditional and more recent solutions based on creating value and employment through recycling initiatives are win-win solutions combining sustainable benefits (developing recycling) with social benefits (creating employment). But these solutions have a 'transitory' character toward a sustainable society based on fare and reciprocal solutions...

We will examine 3 cases in the area of waste management/recycling.

The first case is an example of a traditional service called the neighbourhood ‘Bangarwalla’. This service is an informally organised, urban neighbourhood, door-to-door service, of collecting used recyclable objects from homes and shops, and selling them further to a scrap wholesaler or back to the manufacturing factory.

The service is usually rendered by a person or a family, immigrants from the rural areas, who collect objects door-to-door once or twice in a month, or on demand. They are always seen in the neighbourhood and even if they are not visiting a certain residential society on a particular day, they can be called for an impromptu service by spotting them in the neighbourhood. The objects vary from glass and plastic bottles, tin and plastic cans, newspapers, books, clothes, household electronic items, furniture…basically anything that is not wanted and is recyclable! The bangarwalla purchases the items from residents by weight or by lot.

He tows the items away by handcart to either a small store of his own in the neighbourhood or directly to the scrap wholesalers. At his store, he sorts out the objects, sometimes even doing further recycling like melting the metals objects. The sorted items fetch more money and are sold further to larger scrap dealers or directly sometimes to the manufacturing factories (eg alcohol and softdrink bottles back to bottling companies). Sometimes the store also renders a small/medium size service of a neighbourhood library (from old books/magazines collected) or of a little odd objects/spare parts store. The libraries are frequented and popular particularly among students.

This example is extremely well diffused in urban areas in India, both big cities and mid-size towns. The service still thrives in urban areas. Mostly uneducated, unskilled rural immigrants coming into cities take to this profession, as an easy one to start with no entry barriers. However recently few restrictions have been placed on previously easy accessibility of the service. Eg a lot of residential societies do not allow the bangarwallas into the residential societies for security reasons. Moreover this kind of service is mostly carried out during the day and was more accessible when at least one member of the family was available at home. Now with more and more working couples in the cities, there is nobody home for the bangarwalla to visit. The service has also not been able to upgrade itself to improve the earnings of the service provider.

Bangarwallas make anywhere between Rs 2000 to 5000 per month, but still retain the social stigma of a job to be done by one less privileged or a rural immigrant. It is an essential service but not given its due recognition and not upgraded to a value added professional one.

The second case is also a traditional example of the 'Urban Ragpicker Community'

Urban Ragpicking is an informally organised service, where individuals pick up recyclable items such as plastic, glass, paper, wire, cans etc. from public dumps and garbage bins, and further sell it to scrap dealers.

The ' urban ragpicker community' in India consists of poor immigrants from rural areas, typically from particular villages in the South of India. Each group informally adopts a certain garbage route consisting of public dumps and waste bins. They start off at 4 am in the morning with a gunny sack and start picking out recyclable waste like cans, plastic bags, bottles, papers etc. from the bins. Not armed with gloves or any other tools, this job does not suit all because of the health hazards associated. By 7 am they wrap up their rounds and take their sacks to nearby scarp dealers who pay them for their collection of the day. The rest of the day, they are occupied with other more organized jobs, like residential colony sweeping or domestic housework. This job is typically carried out by women. Interestingly, the particular tribal, rural communities that get into it have displayed above average health immunity that this job demands.

Again, this example is highly diffused in all urban areas in India.

Entering dumps and bins with no proper safety equipment increases the health hazard of this job. The service does pay enough for survival needs, but has a high social stigma attached to it. However the contribution of this community to the urban waste management system has been recognised by some city municipalities. In some municipal wards they have been provided with better tools like gloves and an overcoat and in some cases, also day wages. However, this is still the exception and has a long way to go before becoming part of the formal system.

The third case called the Daily Dump is an example of a contemporary service started in Bangalore, a big city in India..

The Daily Dump is a Home Composting Solution, proposed by the Shristi School of Design, Bangalore, selling composting products and tool kits to residents and also services to help start and maintain the composting activity at home.

The solution is proposed as a system, which includes composting technology and products, with service maintenance plans to support. The composting products and containers can be purchased by residents. In addition, start-up and maintenance services are also available whereby residents can avail services of an expert to visit them at home and maintain their composting planters on a regular basis. The solution is supported by a website which encourages users to share information and experiences on composting. The service is promoted via local clones in different cities, the website, local stores and events on composting and ecology.

This is a new service started in a single Indian city and is just gaining ground as a replicable idea. It is still mainly active in the origin city that is Bangalore, but is now also being offered through a quasi-franchise route in few other cities in India.

The service is currently only being promoted by the original entrepreneurs, is the Shristi Design School, Bangalore, so its reach is limited to that of a private service. It involves a behavioural change on part of residents, where in the past, they have been used to dumping wet garbage into garbage bins, now they have to put efforts to sort out the wet garbage. Moreover, the technicalities of composting are not widely understood and it is seen as a messy activity attracting flies and smell. It is also perceived as an activity that requires a larger space or an outdoor space, which is a constraint in most urban apartments.

In synthesis, what is interesting to note is that though all the 3 cases are interesting in terms of sustainability i.e. enhancing recycling or composting, but the first two are more 'transitory' whereas the last one is more in line with 'sustainable lifestyle'. The difference lays essentially in whether or not the solution is based on cheap man-power and hazardous working conditions.

In the first case, there is much more potential and reach for this service if it becomes part of the formal municipality-driven recycling chain and people are encouraged to recycle-exchange more. And very importantly if this becomes a means of offering fair wages and social inclusion to the ‘bangarwalla community’.

The spin-offs from an initiative like this could be a second-hand store in the neighbourhood for tools, furniture leasing or second hand clothes, games store, that helps re utilize neighbourhoods objects within the same neighbourhood, thereby eliminating the need for transportation of waste to scarp dealers and factories……The currently run bangarwalla second hand stores could get a makeover, as a neighbourhood leasing store, promoted by the residents as solutions for more sustainable living.

Again, the bangarwalla case is more of a post-recycling nature….and if garbage was sorted out at source, this step would no be necessary at all. This service is therefore is also more of a transitory nature in a society leap to more sustainable solutions. As pointed earlier, although it does generate income and employment for rural immigrants, (that is a social benefit in a country like India), it does not give them better working conditions or ensure fair wages, two very important conditions to qualify as sustainable lifestyles. However, it is worth pondering if there is a more long-term way of incorporating the services of this community, who are like a specialist community in these services, towards more sustainable waste management solutions.

The Daily Dump encourages sorting of waste at source and hence is more sustainable. This service is by far the most sustainable of the three, since it is based on a spirit of more of "collaborative services" and fair wages to all Again if recognized by the municipality it could offer a wider spread reach. It also actively encourages micro enterprises by training people in the delivery of such a service to start their own businesses.

Each of the above solutions has a role to play in the transition from Traditional sustainable to Long-term sustainable solutions for a changing Indian society with changing needs. The Bangarwalla case brings to light the existence of a local infrastructure available for waste management needs. Collectively pooling together these services for each neighbourhood, recognizing and fortifying it with government and resident cooperation, finding news ways of accessibility, delivery and value addition can make this service relevant and useful to contemporary society. The Ragpicker community services can also be effectively used in the transitory phase, and can eventually be clubbed together with a better service idea like the Daily Dump. This community can be encouraged to start micro enterprises in different neighbourhoods offering services like the Daily Dump and other sorting, recycling of waste at source, more like waste Management Cells in various residence. For at-source service. The key is to use the infrastructure already available, club it together with the efforts of the municipality and get resident buy-in for more recognition, wider reach and value added innovations….towards more sustainable solutions.

3. Revitalising traditional solutions...

The main concept of this paragraph is to show that emerging contexts still have traditional collaborative structures but that they tend to disappear behind the progress of the western-like consumption society. In order to have a chance to 'leapfrog' from these still existing potential of sustainable solutions, they should be revitalised through new ideas...

The activity examined here is Food Supply Networks, both traditional and merging in India.

The first case is a traditional example of a 'Neighbourhood Bunya Store'

The store is of a neighbourhood grocery store, small-scale, usually run by a family or relatives from a particular community, stocking dry groceries and daily household consumption goods.

Residents can buy their supplies from the store or also avail of home delivery of the same. The home delivery option was started because of increasing competition from new retail formats like Food Supermarkets. The local stores also offer goods on credit, small quantity purchase, special items ordered on demand and a relationship-based service that one can bank on even for emergency purchases or sourcing one-off products. This has a high diffusion level in all urban cities in India

So far the emergence of big retail food supermarkets has not dramatically impacted the small grocery stores. But as time passes, they are beginning to feel the impact. Once again, change in the lifestyle of people and more working couples, means less time on weekdays. They are preferring to do their grocery shopping at one go, in bulk over the weekend. The big format stores are a convenient option to do all shopping at-a-go and also offer better prices for larger quantities. Moreover big format stores, spend large amounts on marketing, with high visibility through TV advertising and promotional fliers in the newspapers, often tempting buyers into buying things they do not actually need. In India, where Mall cut lure has just emerged, weekend mall visits are becoming a part of a family outing trend. The air conditioned environment, movie complexes and food courts are seen as a good getaway spot for families. So it's easy to complete the grocery shopping there as well.. Big format stores also offer larger shelf varieties and the latest product offering and promos, with cheap pricing.

The second example is also a traditional one – The local sabziwallas/fruitwallas

This service is very similar in nature to the above case and works on the same lines, but is offered for fresh produce. The service is provision of fresh fruits and vegetables from individual stands or carts, either static points like local vegetable markets, or mobile on carts. Again offering home delivery and customised ingredients, based on client requirement. The local sabziwalla is usually a rural immigrant from a particular community. He sources his supply of vegetables every morning at 4 am from the local wholesale market, which in turn gets its fresh supply of fruits and vegetables from areas around the city on a daily basis..

The third case is a New case emerging called the Navdanya organic food supply initiative,

An NGO called Navdanya runs an organic food store and organic food home-delivery service based on subscription in New Delhi.

Navdanya has direct links with organic farming communities and cooperatives from where it sources fresh organic produce and dry grains. It also sells processed organic products. Its flagship store is in New Delhi and it has also expanded recently to Mumbai. Residents can buy at the store or can subscribe for weekly home delivery of organic produce, including seasonal fruits and vegetables. The store also has a restaurant which promotes freshly cooked food.

Navdanya directly faces competition from big format grocery outlets who offer better prices and larger varieties to the urban middle classes. In India the trend is that a population traditionally used to consuming organically grown produce, are now aspirational about consuming processed foods, imported ingredients and MNC brands as symbols of a more affluent aspirational lifestyle. The Navdanya format also breaks from the traditional wholesale food supply network, hence is more expensive to manage and adds to the food cost. Besides, it can only be offered in areas where organic farming clusters are present or can be developed.

Finally the fourth case discussed is the Satvik Food Festival as an emerging food supply example.

This is an event that brings together local organic farmers from around Ahmedabad to sell fresh and locally processed organic food to urban residents of Ahmedabad.

A fair or mela is organised once or twice in a year and organised by the famous educational institution, IIM Ahmedabad on its campus grounds. The event is targeted as a weekend outing to urban families and brings together farmers and residents looking for fresh organic food together directly. It enables building of direct links between them, cuts food supply costs and also encourages local food culture.

Currently the event is an annual/biannual feature and hence can only suffice for occasional food buying and not regular food supply. After the event, there is no link or relationship maintained between farmers and residents for longer term or more regular services.

In synthesis, the key ideas that are important here are to find ways in which to revitalise traditional solution like in the first two cases. And in the latter two, to find possible routes of furthering the benefits offered, namely, Navdanya in providing high level quality (organic) and service (subscription delivery); Satvik Food Festival in desintermediation (direct access to producers and short distribution circuits)

In the traditional examples, the advantages of credit facilities, buying small quantities, home delivery and offering specialised ingredients still hold well in favour of the small bunyawallas. If these services are further strengthened and new more sustainable options like organic food supply and local ingredients are added, these formats can continue to stay profitable in contemporary society.

Educating people on the benefits of organic food needs to go hand-in-hand with promoting a service like Navdanya better. Creating local networks of people interested in organic fresh foods, who can play a role in the support and delivery of fresh foods in their locality and possibly also co-manage local delivery points for food would help diffuse this service wider and make it more viable. This will bring down the cost of the food and ensure wider reach. Getting the support of the agricultural ministry and other natural food associations will also help bring better recognition and quality assurance to this service.

Events like the Satvik Food Festival can be used to encourage building of direct links between farmers and residents. Subscription based service could be offered and residents signed on at the fair. The farmers could form a collective and promote their services through a website, thereby maintaining direct links with the residents and possibly offering more regular service for daily food needs.

A widely diffused service infrastructure already exists in Indian cities in the form of the local bunya store and local sabziwalla. This infrastructure already offers localised services, customisable, and operate based on one-to-one relationships. If these infrastructure were tapped into and revitalised to provide organic food, they would be infused with a new life and more competitiveness on one hand and they could offer sustainable food options for local residents on the other. NGOs like Navdanya could take on the role of a franchisor, procuring the food and offering it to these local stores for delivery. Festivals like the Satvik Food Festival could also open up new routes for food delivery, new direct links between farmers and residents. Organic farmers could also have direct links with local grocery stores/sabziwallas, and use them as a value-added interface to serve residents.

4. Beyond "fix-it" service society...

The concept in this section is to explain the challenge for India to pass from a 'spontaneous service society' based on over-population, cheap labour and particular traditional cultural specificities to a 'mature service society' based on both sustainable solutions (reducing environmental impact and promoting fair trade activities) and robust solutions (more professional and reliable services through organisational and technological improvements).

The activities examined here is Mobility Solutions in urban India

The first case is a traditional one, that of the neighbourhood school childrens pick-up and drop service

A group of families in an urban neighbourhood often get together and organise a single taxi or autorickshaw with a driver, to pick up and drop their kids from school. Mostly the person hired for the job, is a known one from the neighbourhood. The service is hired on a yearly basis for fixed hours of the day. The driver goes to drop the school children before his usual rounds of public taxi driving, and picks them up on his way home or as required. He is paid a fixed amount for his service by each family, normally monthly, and this sum works out much cheaper than each family hiring an individual taxi or autorickshaw. And in turn the family feels comfortable, knowing that their kids are with a familiar person from the neighbourhood.

Sometimes, this service is also initiated by an entrepreneur from the area who will have a fleet of two or three mini vans, hire drivers and offer this service to families. This service is widely diffused in cities in India.

The drawback with this service, is that often these vehicles, whether the taxis, minivans or autos are not designed specifically for this purpose, and hence do not have the necessary safety in place to transport children. Also, parents tend to compromise and these vehicles are normally overstuffed with children, beyond capacity, further reducing safety. There have also been instances of accidents due to reckless driving with these services.

The second case is that of a public-private partnership for car pooling called CarPoolmumbai.com

An online Carpooling service being offered in Mumbai, where residents can pool a car via email, sms or telephone.

The main platform is a website wherein interested users can register and offer or avail their services for car pooling. This initiative has been given a boost by being adopted by the Mumbai traffic department. The traffic department has negotiated with one of the main banks and insurance providers, ICICI, for a variety of incentives to promote this imitative. ICICI Bank offers rebates on insurance premiums for car poolers. In addition it is planning to come up with a chip that will trace registered cars and their locations. Thereby if a single occupancy car is passing by a certain locality and a user is interested in taking a ride, he/she can call an ICICI Call Centre who will trace the nearest car and connect the two. Users also get deals and discounts from Movie Multiplexes, Coffee Shops, and Restaurants. Safety of the passengers is also ensured since all car poolers are registered with their details.

In synthesis, can such informal, improvised services like the neighbourhood pick-up, be turned into more structured and sustainable ones? The first case illustrates the 'fix-it' level (Metha 2007) of solutions, wherein solutions have been adopted as a reaction, by the sheer need for them, but lack the progress towards a more professional, safe and quality approach.

The second case of car pooling, on the other hand, shows how an informal practice of car pooling could be turn into a more organised one. The car pool service has already taken off

very well, due to the support of the Traffic Department and now a large corporate entity like ICICI Bank. The initiate is doing very well among users, especially women, who previously would have had to travel by public transportation. The boost given by the traffic department has given this recognition and has helped the numbers pick up quite well. However, getting individuals to switch from the comfort of having their own car (and sometimes driver) to car pooling will be a challenge.

The service if interfaced with a car tracking technology will work very well for both subscription based and more spontaneously car pooling. Tie ups with other service providers and incentives for using this service have also proved popular.

Car pooling as a service has come into existence to combat excessive traffic congestion of cars on Mumbai roads. However, it is a reactory solution that may ease part of the problem. Again, looking for long term sustainable mobility options, newer services that offer a combination of car share/car pool will need to be introduced with sophisticated and professional delivery platforms for ease of use and accessibility of the service. thereby helping larger number of users migrate from owning individual vehicles and driving with single/double occupancy.

Conclusion

This is a critical time for Indian society. The economic reforms introduced and subsequent liberalization, have led to an Indian economy that is growing on a bullish fast-track of more than seven percent annually. Most of India is young, (over half is under twenty-five years of age) and aspirational of an affluent lifestyle – more often than not inspired by Western lifestyles through media.

The process of globalization has also impacted Indian tradition and culture. A society whose tradition and culture has revered nature and promoted restraint in consumption, is today changing. Traditional, more sustainable choices in daily living are no longer seen as Progressive,' 'Modern', 'Glamorous enough' or sometimes even 'Relevant' to modern-day life. However, in the current state, the traditional Indian service infrastructure and the services they offer, are not eroded and still very much alive.

The challenge of this 'booming' Indian society is to 'leapfrog' from the current situation to more sustainable lifestyles; among other issues, through the rethinking of certain existing social practices and services;

This challenge is exciting and also shows a counterpart of opportunities for Indian strategic design to develop these sustainable lifestyles such as:
- the existence of still strong traditional communities providing participative and collaborative solidarity frameworks;
- spontaneous and natural skills to develop services that could consolidate in agile infrastructures supporting daily living;
- a availability of strong ICT development capabilities to support social collaboration and synergy.

The right interception in time, through services designed for the contemporary context using the available service infrastructure, could infact help 'Change the Change' from 'Sustenance to more Sustainable Living' in the Indian Context.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Learning Network on Sustainability

A mechanism for the development and diffusion of system design for sustainability in design schools

Lara Penin[1], Carlo Vezzoli[2]

Abstract

The LeNS project is an action of curriculum development involving seven partner institutions in Asia and Europe that will jointly design, produce and implement new modular and adaptable courses and teaching subsidies in Design for Sustainability with a focus on product service system innovation, contributing to the transition towards sustainability.

The paper will describe LeNS as a mechanism to develop and diffuse system design for sustainability in design schools in a transcultural perspective, where design educators in industrialized and emerging countries share knowledge and come out with a design education agenda able to respond both to local and global sustainability challenges. LeNS output will be an open artefact, allowing a decentralised and collaborative production and fruition of knowledge.

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1. Introduction

Approaching sustainable development from a global perspective, there is a very clear need of shifting of consumption and production patterns of industrialized, emerging and low-income countries. This shift or transition will have to respond to the challenges of radical reduction of resources consumption and emissions, not to mention socio-ethical aspects such as poverty reduction and increase of wellbeing. There is an emerging understanding that a great deal of this change can be directly linked to decisions taken in the design phase of products, services and systems (system design understood as both the design of the mix of products and services jointly capable of fulfilling a given demand, and the design of the interactions among the stakeholders involved in the offer).

Along the last decades, the role of design has increased in relevance and recognition, and the approach of *Design for Sustainability* has been evolving in research and has started to be recognised in many parts of the world. It is clear that designers must have a theoretical background as well as know-how that enable them towards a practice committed with these pressing challenges. Design schools have therefore to be able to provide design students with a broad knowledge base, as well as effective tools so a new generation of designers can have an active role as catalysers and enablers of the transformation of our consumption and production patterns.

Under this perspective, there is a pressing need of mechanisms that act at the education level, enabling design educators in industrialized, emerging and low-income countries to share knowledge in this field and come out with a design education agenda able to respond both to local and global sustainable development issues. This paper will present the concept of a multi-polar network on education for design for sustainability involving design schools in Europe and emerging countries in Asia, as an effective strategy in this direction. This concept has been formalized in the project ***LeNS: The Learning Network on Sustainability, Asian-European multi-polar network for curricula development on Design for Sustainability focused on system innovation***, funded by the European Commission programme Asia-Link[3].

The LeNS project proposes curriculum development in seven partner institutions in Asia and Europe that will jointly design, produce and implement new modular and adaptable packages of curricular courses and modules. This will include teaching/training materials, teaching tools (including distance-learning), guidelines for courses/modules design and implementation and illustrative examples.

In practice, the design of this curriculum package starts from the analysis of the current state of art (i.e. how *Design for Sustainability* is currently approached in the partners institutions and in the respective regions) and takes in consideration the local needs and constraints of each partner context as well as the global agenda of sustainability. From this initial verification, the partners will jointly design the didactic pilot courses/modules to be implemented in each partner institution through an exchange modality that combines two kinds of flows:

- content flow, with students from European partner institution designing for an Asia partner campus; and students from Asian partner institutions designing for European partner campus,

[3] LeNS is an action of curriculum development funded by the Asia Link programme, under European Commission's EuropAid Programme. It is a 3 years project started on 15th December 2007 coordinated by Politecnico di Milano University INDACO Department (Italy) and has as partners Delft University of Technology, Industrial Design Engineering (The Netherlands); University of Art and Design Helsinki, School of Design (Finland); Indian Institute of Technology New Delhi (India); Srishti School of Art, Design and Technology (India); Tsinghua University, Industrial Design Department, Academy of Arts & Design (China) and King Mongkut's Institute of Technology Ladkrabang, Faculty of Architecture, Department of Industrial Design (Thailand).

- experts flow, with European partner institutions hosting Asian partner staff; and Asia partner institutions hosting European partner staff.

This unique combination of content and experts flows will allow of the flourishing of innovative forms of collaborative didactics that explores both in-situ and distance-learning, configuring a *transcultural* didactic process, an effective approach for design education, where design schools become labs for experimental research and education. In this perspective a sort of osmotic process between open-front research and experimental didactic is created, creating a continuous flow that contributes to develop and verify new hypothesis on design approaches, methods and tools for sustainability. And, through this process, sensitise and empower a new generation of designers worldwide to reach design practice through an embedded sustainability approach.

The LeNS project has the ambition of being a catalyser for actions and exchange on education in design for sustainability worldwide, through the production of an open-source curriculum package (***OLEP: open learning e-package***), a strong dissemination and communication strategy (through prizes, conference, exhibition publications and thorough on-line exposure) and finally a replicable web-platform to be easily reproduced in a worldwide scale.

2. LeNS process and approach

LeNS is an action of curriculum development in the field of Design Sustainability and PSS innovation design. Its starting point is that a new generation of designers is formed with the right conceptual and operative tools to be able to cope and contribute to this transition towards a sustainable society. For that, design educators across regions should be able to create and incorporate new learning resources into existent or new curricula. In the LeNS project, the focus is on Europe and Asia, but its ambition is to reach worldwide design educators and schools through the production of an output that follows an open source model, allowing users from around the world to use and transform it.

The benefit thus of LeNS project are in the first instance for the partners institutions but it can and hopefully will be expanded beyond them.

The LeNS process foresees the development of new curricula reflecting both a shared macro agenda on sustainability but also localised, contextual sustainability agendas that respond to local needs and demands in the economic, social and cultural levels. It takes in consideration also the experiences and expertise at each partner that may emerge under different forms. The partners will analyse what is their state of art in terms of didactic and research in DfS and PSS and express what are the main demands not yet covered. The partners will then collect and develop new subsidies for new courses and come out with a first (beta) version of the Open learning e-package (OLEP). OLEP beta version will be used (tested) along 8 pilot courses at the partner institutions following an exchange modality: each partner will host a guest teacher from another partner and each partner will play the role of guest teacher at another partner, according to an exchange agenda. The logic of this process is that of refining and expanding the beta OLEP along its implementation in the 8 pilot courses, feeding back the original pack. At the end of the pilot courses implementation, a “final” version of the OLEP will be primed and opened to external diffusion.

This process can be summarized as follows (see fig. 1):

1. State of the art

State of the art of current practices and experiences on DfS and PSS in partners (*available*): each partner will gather and exchange their own knowledge, previous didactic and research experiences in the field and share specific priorities and approaches.

This work is done according to the verification of *DfS needs of each partner* according to its own *sustainability agenda* and establishment of localized PSS agendas and approaches (*need*).

The results will be the basis upon which the teaching modules will be designed and teaching subsidies will be developed in terms of disciplinary content and structure and exchange modalities.

2. Design of the didactic pilot modules and teaching subsidies

Development of all the necessary inputs for the implementation of the didactic pilot courses and teaching subsidies.

Didactic pilot courses will be designed and the necessary and teaching subsidies will be gathered or developed *ex-novo* according to expressed needs and demands, including methods and tools.

The process takes further the assessment of need areas of DfS/PSS at partners (*need*) and matches *available* with *need*.

The result is the first (beta) version of the OLEP (open learning e-package) ready for testing. The beta version will be continuously updated along the implementation phase (3).

3. Implementation of pilot courses

The implementation of the didactic pilot module will be carried out within a total period of 18 months. This time span will allow in progress assessment of the teaching materials (OLEP) and consequent improvement for the remaining academic semesters.

Teaching modules will be as much as possible integrated in normal curricula activities; this will both reinforce the institutional commitments and provide reduction of costs by establishing synergies.

The exchange of teachers will be carried out so to implement in each of the partner institutions the didactic pilot courses to be done in collaboration between the local teacher (*host*) and a *guest teacher* in a transcultural learning/teaching process. It is foreseen that a third teacher (the *observer*) will follow the pilot course implementation at the hosting schools (see fig. 2) reporting back the results to the OLEP development.

The pilot courses will be focused on PSS design for food, mobility and healthcare/well-being and will use as design ambit the university campus of each partner.

4. Preparation of OLEP “final version”

According to the results of the implementation process of pilot courses, a “final” 2010 version of teaching subsidies will be formalized. It is a final version regarding the LeNS project (that lasts three years: from December 2007 to December 2010). But, since it will be an open package, it foresees its continuous updating and development to be done by users after the termination of LeNS project.

At this point, the teaching package (OLEP) assumes an open-source model: an online platform for sharing learning objects on DfS, open to external users who will be able to use and transform the original material, and contribute to its further development. In addition, the platform is thought to be reproducible i.e. using the original code, users can reproduce its architecture in a localized version, for example in different languages or focused on specific regions.

During the whole process, an evaluation process will be carried out in parallel, through both external evaluators and internal evaluators (the *observers* of the pilot courses). Dissemination activities are foreseen along the process and in the last phase to increase the diffusion of the in-progress and final results.

3. Need for local PSS agendas in design education

The LeNS project starts from the following assumption on PSS potentialities:

"A system innovation (PSS approach) may act as a business opportunity to facilitate the process of social-economical development in an emerging context - by jumping over or by-passing the stage characterised by individual consumption/ownership of mass produced goods - towards a more "satisfaction-based" and low resource intensity advanced service-economy, characterized by the development of local-based and network-structured enterprises and initiatives, for a sustainable re-globalisation process aiming at a democratisation of access to resources, goods and services".

It starts thus from the assumption that PSS approach is not only valid as a potential sustainable strategy for industrialised countries but it is also a potential leapfrog strategy for low-income and emerging countries. PSS and system innovation bibliography has been almost exclusively produced in and for mature industrialised countries, notably Europe and to some extent the United States. An effort to adapt and verify PSS approach in developing countries in general and in the particular economies of each country is imperative.

This is an effort that started in 2000 by the United Nations Environment Programme (UNEP) involving a group of international researchers to start disseminating and exploring the concept of system innovation in a worldwide scale in particular in the so-called low-income and emerging countries[4]. At that moment, some potentialities of PSS for low-income and emerging countries are highlighted:

"First of all, if PSS are eco-efficient at system level it means that they may represent opportunities, at least at a macro level, for a context with fewer economic possibilities to respond more easily to unsatisfied social demands.

Secondly, PSS offers are more focused on the context of use, because they do not only sell products, but they open relationships with the end user. For this reason, an increased offer in these contexts, should trigger a greater involvement of (more competent) local, rather than global, stakeholders; fostering and facilitating a reinforcement of the local economy.

Furthermore, since PSS are more labour/relationship intensive, they can also lead to an increase in local employment and a consequent dissemination of skills.

In addition, since the development of PSS is based on the building of system relationships and partnerships, [it is] coherent with a democratic re-globalisation process.

Finally, they are coherent with the development of network enterprises on a local base for a bottom-up re-globalisation. This last consideration is quite important since its connection to the potential for convergences between environmental and socio-ethic sustainability."[5]

Another base line is the recognition that PSS already exists in emerging Asia. In India, we observe the share use of artefacts as the norm, as well as productive and social organisation based on "spontaneous services" very much related to micro-entrepreneurship[6]. In China, car-pooling became a very popular practice across the country, responding to traffic congestion of the big cities (even if not recognised by the public authorities as a legal service). In Thailand, sustainable practices are more recognised in traditional lifestyles that are greatly based on resource saving principles. But as we know, the rapid process of industrialisations have imposed changes of traditional production and lifestyles and so forth demands new models and conceptual keys that allow putting in perspective the complexity of these countries. These new models and concepts will not reflect tradition alone, but on the other hand cannot simply mirror the industrialised countries' processes.

[4] Vezzoli (2007 pp 134), Vezzoli and Manzini (2008), see also UNEP (2002).
[5] Vezzoli (2007)
[6] As revealed for example by the project Creative Communities for Sustainable Lifestyles, www.sustainable-everyday.net/ccsl/

The initial challenge for LeNS was therefore starting a process of a more localised in-depth appreciation of PSS and system innovation in emerging Asian countries, considering the great diversity of each country economic, social and cultural model. LeNS has proposed establishing a dialogue amongst its partners so to determine a multipolar and extended knowledge base from where to start the development of curriculum that would respond to these localized PSS views.

The first step of the project was then to understand the main sustainability drivers and agenda at each partner country and region and confront these with their current didactic and research practices, identifying gaps and demands that will inform the development of curriculum and teaching subsidies so to cover the identified need-areas.

In practice, LeNS proposed a mechanism starting from the collection of data at each partner (presented as reports) covering the following points:

- General vision on DfS and the particularities of Df/PSS in partners' context (country and region). How the contextual situation of the partner city/country/region affects the construction of a local sustainability agenda and description and critical view on how the school is dealing with the issue.
- Description of previous experiences on DfS (Eco-design, Life-Cycle Design, Social Innovation, Strategic design, Product-Service System (PSS) Design, etc) regarding teaching and research on education, whether entire courses, modules, short term workshops for under or post graduation students, materials and tools used with students, support tools for teachers, projects and networks, etc.
- Best practices of educational (and research) experiences on DfS, cases and inspiring examples from other institutions.
- A draft map of main design schools in the countries and regions involved where design for sustainability is taught, under different areas or sub-areas such as Product Life Cycle Design/ecodesign, Sustainable (Product-Service) System design, Design of Services, Strategic Design, Design and Social Innovation, Sustainable Consumption and Production, etc.

This information collected at each partner was then collated resulting in some synthesis and tentative maps:

- An overview of the sustainability agenda in the involved countries and regions
- Visions of Design for Sustainability between Asia and Europe, articulating commonalities and variations
- Preliminary hypothesis of country-based PSS relevance areas (localised PSS)
- Map of existing didactic and research experiences on Design for Sustainability and PSS innovation
- Overview of existent methods and tools

These results will provide then insights for pilot course subsidies development (contents and teaching materials), ensuring that existent expertise and experiences and expertise at each partner (that may emerge under different forms) is taken in consideration as well as the new material are developed so to respond to expressed needs of each partner. It should also ensure that the development of new curricula reflects both a shared macro agenda on sustainability but also localized, contextual sustainability agendas that respond to local needs and demands in the economic, social and cultural levels.

4. Transcultural pilot courses

A cross-learning mechanism for design educators

The 8 pilot courses foreseen in the LeNS process will occur through an exchange of teachers of the partner institutions (experts flow). European teachers will teach in Asian design schools and Asian design teachers will teach in European design schools.

The pilot courses will be as much as possible integrated in normal curricula activities or within new courses or workshops, structured so to maximize the interaction between the ***guest*** teacher and the ***host*** staff and students.

The exchange scheme foresees that one ***hosting teacher*** will receive a ***guest teacher*** coming from the counterpart institution within the thematic cluster and in a second moment will be received as a guest in the counterpart institution (the roles of guest and host are inverted and the same procedure is repeated) see fig.2. The thematic clusters determine the exchanges, as follows:

- **Food-chain A: pilot courses 1 and 2.** One partner hosts a guest teacher into his/her course. Students at the host partner will design new sustainable **food** solutions for the university campus of the guest teacher.
- **Food-chain B: pilot courses 3 and 4.** One partner hosts a guest teacher into his/her course. Students at the host partner will design new sustainable **food** solutions for the university campus of the guest teacher.
- **Mobility 2: pilot courses 5 and 6.** One partner hosts a guest teacher into his/her course. Students at the host partner will design new sustainable **mobility** solutions for the university campus of the guest teacher.
- **Health-care/wellbeing: pilot courses 7 and 8.** One partner hosts a guest teacher into his/her course. Students at the host partner will design new sustainable **health-care/wellbeing** solutions for the university campus of the guest teacher.

Each exchange is followed by a third party, the ***observer***, a teacher coming from a third partner. The role of the Observer is monitoring and annotating the development of the activities along the period of implementation of the pilot course at the host institution. The observer will be in-site during the visit of the host teacher at the guest institution and follow the developments of the long-distance collaboration. The aim of the observer is that of assessing the process of implementation of the didactic pilot module and reporting its results to the work package leader.

The observer can intervene and contribute along the process of implementation of the courses whether during the ‘on situ’ phase or the virtual (long distance) phase. This will happen in accordance with the 3 involved partners (guest teacher, host teacher, and observer). At the end of each half cycle of exchange, the observer will prepare an evaluation report, that will feed back the teaching pack, that can be updated transformed for the following pilot course implementation.

The implementation of the 8 pilot courses will be carried out within a time span of one and an half year, so to allow in progress assessment and consequent improvement for the remaining academic semesters. The OLEP therefore will be constantly evolving along the implementation of the pilot courses.

The exchange activity aims as a whole to promote a process of mutual learning, intended as a **cross-learning mechanism** among the partners: each teacher learns form each other, not only in terms of contents, but also in terms of teaching views and approaches. This process of sharing is extended throughout the whole project. The pilot courses will be the highest point of the cross-learning process, where the guest teacher and the observer will follow how the host teacher conducts his/her course. The other partners (not present) will learn via video-recorded lecture.

A transcultural design exercise

LeNS' exchange mechanism foresee also a content flow, referring to the exchange that will take place in terms of design subjects: students from European partner institutions designing for an Asia partner campus; and students from Asian partner institutions designing for European partner campus triggering a collaborative international design process.

The strategy of using the university campus of other contexts (countries) as the design ambit for experimental learning courses can be justified in two levels.

First, adopting the university campus as the design ambit:

At the theoretical level, if we assume the whole experienced based on the approach of system innovation and transition for sustainability, the campus is a peculiar restricted community, an ambit for which it is effective to design (and implement) sustainable innovative solutions in technological, socio-cultural, organizational, economical and environmental terms. We can say thus it could be thought as a "community-lab" for sustainable innovation. At the same time, campuses could represent an optimum "community-window", because of their potential to showcase and disseminate the sustainable innovations and ideas later to be spread to wider communities (and to society at large).

At a practical level, the approach is effective because is easier for participants to collect information about the campus since they are working in the campus, and at the same time students living (and/or spending great part of the day) in campus should be well motivated and aware. Even in cases where the campus is restricted to a building, there is a community of student and teachers eating, moving to and from, taking care of wealth, etc.

Second, adopting a (campus of a) different context (country) as a design ambit:

An initial clarification is necessary. It is certainly not our idea that a designer who is alien from a particular socio-cultural context could alone design sustainable products, services or a system for that context, unless when part of an international ad-hoc team.

The intention instead, is to promote an experimental learning design exercise for students. The focus is on the learning process for students, where the value is not only the strict feasibility of the students' concepts, but rather the process of confrontation with other socio-cultural context in a design process (even though experimental). In this sense, proposing students to design for another country's campus enables:

- students/teachers (designing for other campuses) to discover a different context from their own through a strategic analysis of the information provided and through direct critics and evaluations of local teachers.
- teachers/students (when evaluating/criticizing the concept designed for their own campus) to discover another's culture interpretation of their own (and even be surprised by unusual ideas)

Said in other words, we enable a "transcultural" learning process by introducing the students (and teachers) to an approach able to "decentralize" one's own cognitive references and values, and direct oneself towards other cultures returning to one's own culture enriched by the confrontation experience. This process should also give the students the perspective of an international design practice and an enriched cultural experience. Since it is an experimental process, it does not embody or express a consolidated truth, but are a testing ground for some hypothesis, and will reveal for sure some limits to be understood.[7]

[7] It is also worth mentioning that this approach has already been tested in previous experiences: since 2002, POLIMI has been partnering with IIT Delhi and the Tsinghua (together with other universities in Brazil, China, Turkey and South Korea) in an informal educational network on the theme of Design of Sustainable Product-Service Systems for their respective university campus, named LENS (formerly known as DECOS). These experiences are the basis of the EC funded LeNS project.

5. An open source learning model

As it has been initially described in section 2, the main final output of the LeNS project is the Open learning e-package (OLEP) on System design for sustainability. We can enter now a little bit more in detail of the OLEP's nature and mechanisms.

The OLEP can be described as an e-package composed of a set of learning resources targeted at design educators, to facilitate the activation and implementation of courses on design for sustainability (DfS) with a focus on sustainable (Product Service) Systems innovation. The learning resources of the OLEP will be easy to be used and free being based on the open-source and copy left logic: users (mainly teachers) can download, modify and reuse the available set of learning resources. The OLEP will be targeted also at students, designers, entrepreneurs and interested persons/institutions. The OLEP will be located within the LeNS web platform.

Generation and acquisition of contents

The open learning e-package contents will be produced during the LeNS project, but can incorporate other existent or future material considered as interesting and relevant. Most part of the materials will be developed within prior to the pilot course implementation and will evolve in synergy with the courses implementation (see figure 1). It will be edited into its final shape after the pilots' implementation.

The teaching materials will be developed based upon the identified needs. They will be also partly based upon the teaching materials of the partner institutions developed prior to the LeNS project, as well as new teaching materials to be developed *ex-novo*. Each topic will be covered by a range of different supporting media. These activities will be concentrated before the beginning of the first pilot course, but will continue along the whole implementation process, that is spread in an 18 months time span.

Next to the teaching materials developed and collected in the preparatory phase, the core of the OLEP will be constituted by the materials used in (selected to/developed for) the 8 pilot courses. In practice, each partner teacher holding a course will develop (as normally for any course): a programme for the course; a series of computer presentations to support the lecture; a series of video-recorded lectures. And each teacher holding a course will make available for his/her students: a series of texts (course bibliography); a set of tools for the design exercise, whether new or existing tools.

After the implementation of each of the 8 pilot courses, an evaluation will be carried out (based on the observer report) to assess the impact of each of the teaching materials used. This assessment will inform the teachers of the next pilot courses as well as the progressive development of the OLEP final version (indicating for example if a given tool needs to be adjusted, materials that work better in a given context, etc).

Any existent educational support material considered as interesting and relevant will be also incorporated (e.g. tools, texts, power point, etc. used by teachers outside the Lens consortium). Finally, a final conference is foreseen to the presentation and discussion of these results. The conference proceedings as well as a selection of the outcomes of the award, exhibition and other dissemination activities will be incorporated to OLEP final version.

OLEP general requirements

The open learning e-package (OLEP) aims at facilitating the introduction and implementation of Design for Sustainability (focused on product service system innovation) in the educational curricula of design schools and universities worldwide (starting form the LeNS consortium).

In practice, the open learning e-package contents will be:

- Indications, guide-lines and examples of courses (programmes, supporting materials, expected results, etc) targeting teachers who wish to activate new courses or renew

existing ones on system design for sustainability (incorporating it on the school/university curricula)

- Materials and tools to support teachers in holding courses and didactic modules, on system design for sustainability.
- Materials and tools to support students who follow courses on system design for sustainability.
- Materials and tools to support designers in incorporating DfS thinking into their practices.

The OLEP is meant as a modular package of learning modular resources (or learning objects). Any interested design teacher is allowed to: **download, modify/remix and reuse**. The aim is to allow any design teacher to adapt and use the learning resources he/she finds useful, according to his/her specific didactic needs, institutional requirements or local context particularities. Also students and designers are welcomed to access the OLEP to support their learning activities (linked or not to a given course).

The OELP contents will take different formats:

- Texts in different formats, such as print-on-demand from the publisher (with ISBN code), printable in common printers (whole or partially), readable on screen, editable files (for open-sources documents, modifiable by the user)
- Slides presentations
- Composed presentations that integrate video-recorded classes (teachers classes and students presentations) with slides presentations
- Audio or audio/video files (e.g. recorded lessons)
- Software and other tools
- Archives and databases of best practices, examples, etc.

The e-package will be hosted at the LeNS web-platform, to be directly downloaded by users (typically registered teachers and students). On-line visioning should also be possible (with the possibility of streaming audio-video). To allow greatest diffusion and penetration to teachers (and students), all e-package contents should:

- Be free-access (preferably)
- Have a modular structure
- Be developed with an open-source and copy-left logic (preferably), with intellectual property rights (authorship), but without restrictions to diffusion (i.e. Creative Commons license).

The system architecture will facilitate the access of teachers (and students), allowing optimal fruition. A pragmatic and user-friendly approach will be followed and a guide will be prepared and made available identifying different users profiles to properly guide them throughout the OLEP use (teachers, students and designers). Nevertheless, learning resources could be accessed as **single** objects or grouped objects as related to a particular course/teacher. More precisely, a pre-selector and three modalities of access have been so far identified:

- a language filter will be available as pre-selector
- access to all learning resources of a particular course/teacher (e.g. a teacher who wants to start a course from the beginning could have be interested in an overview of the organisation of all the contents within a course; and a student who wants to receive support for the course he/she is following could have them gathered);
- access by content regardless the teacher/course (e.g. allowing a teacher who wants to improve a course to get direct access to all that has been produced/collected related

to a specific issue; and allowing a student who wants to deepen a content to get direct access to it independently from the teacher indications);

- advanced access by other tags/metadata typical of learning resources; the list of tags to be associated to learning objects are listed at the end identifying a proposal for compulsory; suggested and optional.

Teachers who are part of the LeNS consortium will be able to update the e-package during and after the project duration. They will constitute the OLEP scientific board. Teachers and users external to the LeNS consortium (the wider network) will be able to use the package through an open-source logic as described earlier, but the update will be controlled by the LeNS scientific board, safeguarding the scientific reliability of the new materials. External teachers and users of OLEP can apply to become members of the scientific board after the project termination (rules to be defined).

6. Conclusions

LeNS aims at becoming a mechanism for the development and diffusion of system design for sustainability in design schools. It appears to us that this is proposed in the right moment, when sustainability is being incorporated in the worldwide agenda and in all levels and there is a clear perceived growing demand of design for sustainability, especially in Asian emerging economies. It appears also that it is the right opportunity, of interfering at the education level, since education is very much the base of every change.

Contributing to this process of transition towards sustainability requires facing the complexity of the current dynamics of a changing society, where global and local drivers are in permanent dialogue but not always find balance.

In this framework, LeNS ambition is first of all that of being in itself a transcultural learning process. Design educators will be confronted with different learning approaches and different approaches regarding DfS in relation to both global and local interpretations and priorities of sustainability. Design students will be confronted with design subjects that are different from their usual design situations. In both cases, a cognitive challenge is created, in a vision of a *cosmopolitan localism* (Sachs, 1998, Manzini, Vugliano, 2000, Manzini, Jègou, 2003), a condition where actors find a positive balance between localization (being rooted to a place, a community, cultural values and socio-economic conditions) and the "global flows" (Appadurai, 1996) that characterises the contemporary society.

In the long term, LeNS ambitions to offer an ***open*** output, a platform for storing and sharing knowledge (learning objects in design for sustainability, courses, guide-lines and examples, teaching materials, methods, tools, presented through different supports texts, slide presentations, video, audio, etc) among design educators, students and practitioners. It is intended also as a **reproducible platform**, allowing interested users to reproduce its architecture in localized versions, in different languages or focused on specific regions.

This final result: the open learning e-package (OLEP), is intended as a true open source artefact, allowing users to freely **use, modify, remix and reuse** the OLEP material according to their needs in the framework of decentralised and collaborative production and fruition of knowledge.

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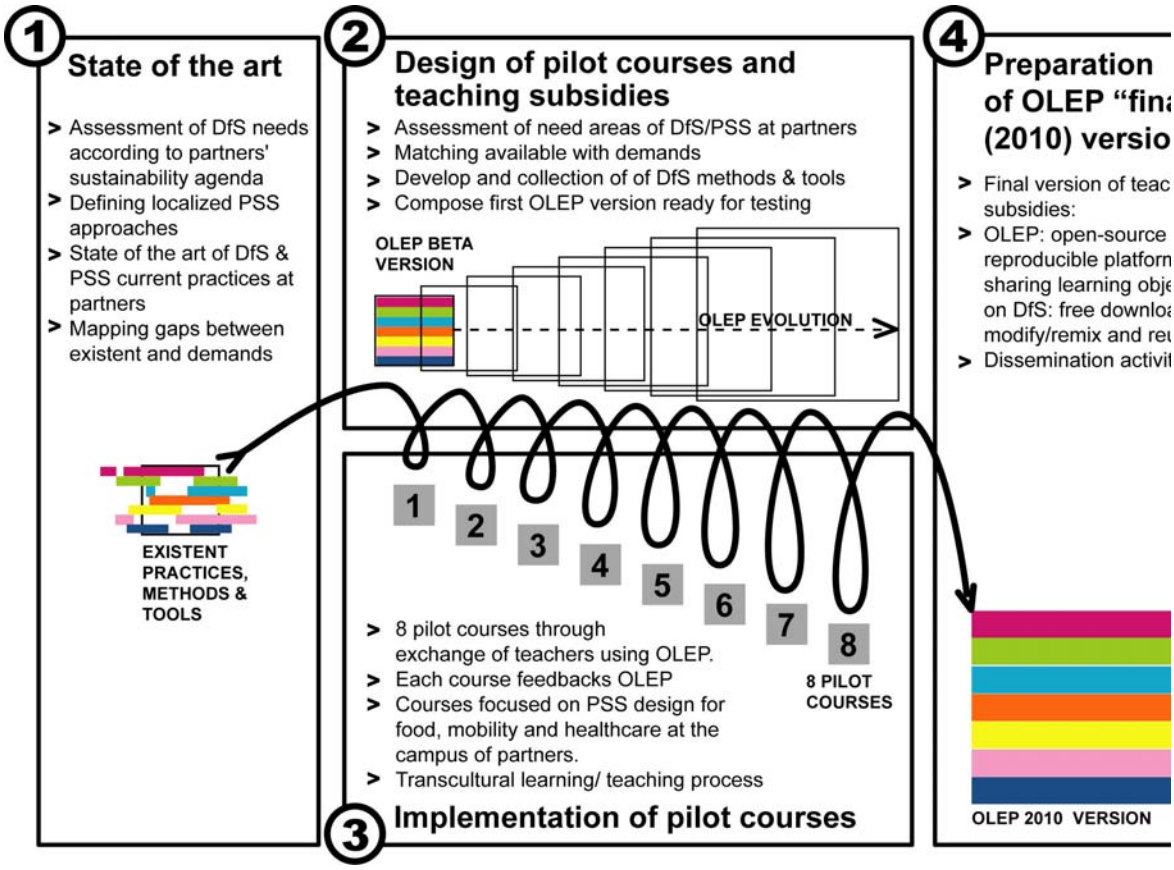

Fig. 1: The LeNS process for the construction of the Open Learning E-Package (OLEP), through pilot courses implementation.

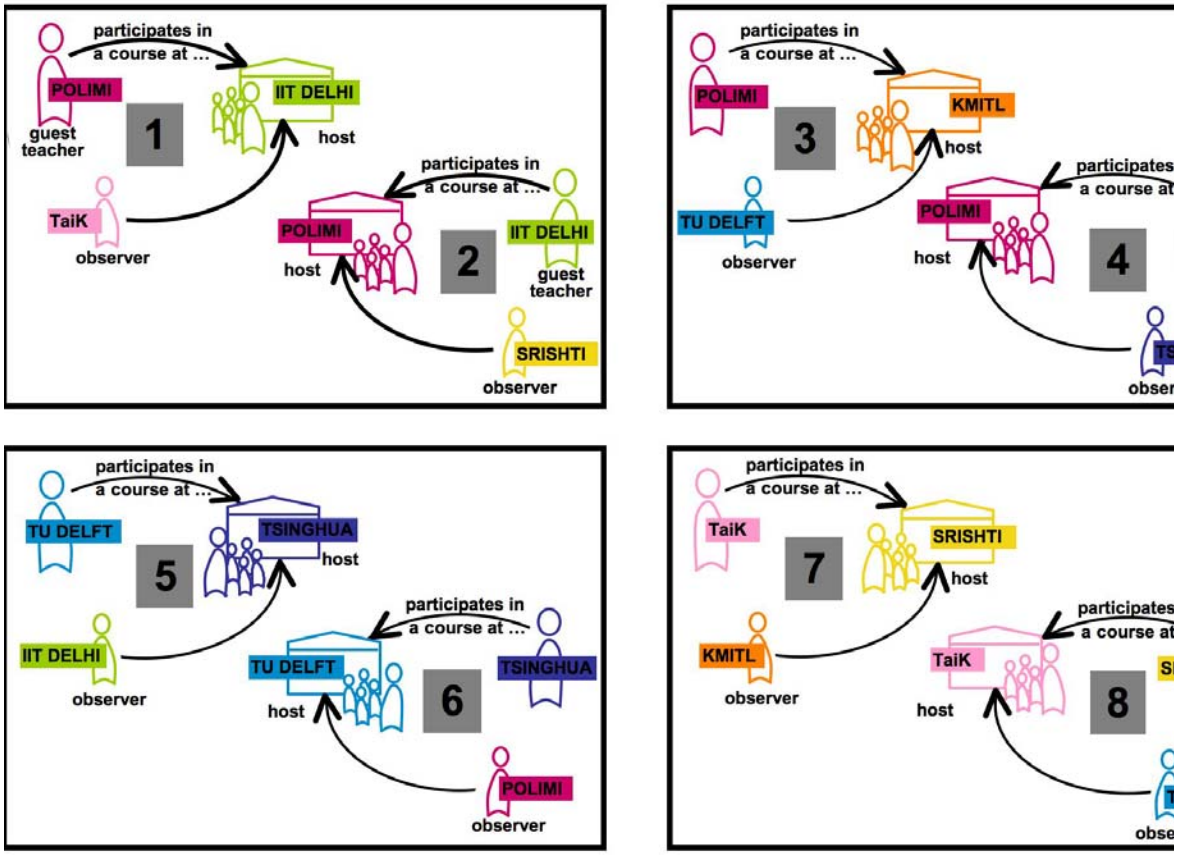

Fig. 2: The scheme of the eight pilot courses, based on an exchange modality of teachers of LeNS' partners institutions

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

DESIGN AND NEW HORIZONS OF SYSTEMIC INTERACTIONS

Technology and application innovation for a holistic approach to problems

Riccardo Vicentini[1], Luciano Bruno[2].

Abstract

The main purpose of this study is to show how the **systemic application** of innovative technologies is particularly effective for solving problems that are normally "resistant" to traditional, specialized approaches.

This study was conducted using a problem-solving methodology and developed according to the principles of **systems design**: rather than using a linear approach which often creates solutions that are **isolated from their context** and so sometimes ineffective, we defined the theoretical model from a systemic perspective which could **enhance the relationships** between each element and create new ones within the scenario.

We chose **Radio Frequency Identification (RFID)** as the technology platform. This technology uses radio waves to read and write data that is invisible to the human eye on special electronic supports.

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1. Introduction

It is easy to observe that RFID is arousing a great interest in universities, companies and society.

Understanding why the approach to this type of technology is often made more of words than of facts is less easy, even for those fields in which the use of RFID application is more consolidated; at the moment, these cases are quite restricted, since they rarely tackle more than one problem at a time, and they never go beyond their current application domain.

Generally, the solution to a problem is found **only from the technological point of view,** and problems are addressed in an extremely **specific, vertical** way: as a consequence, issues are analysed as **isolated from their context**, with the risk of generating effective but “closed” solutions, which prove useless when applied to wider issues.

The main purpose of this study is to highlight Radio Frequency Identification suitability to a **holistic approach**, providing a possible support for the analysis and simplification of complex systems.

Consequently, a **systemic** approach can become an added value, allowing to range from situations of simple traceability, logistics and operation management in the industrial field, to the identification of solutions which, thanks to the contribution of universities, industries, society and citizens, can become elements of remarkable innovation and integration of both traditional and innovative technologies, to solve problems “resisting” to specific applications.

It is clearly outlined that solutions are no longer aimed at a single application, but **are tailored according to the needs of actual end users**: common citizens, but also tourists, or weak social categories such as children, elderly and disabled people, thus giving to this project an additional **high social value**, as well as importance for the public opinion.

It seems clear that RFID technology, essentially flexible and providing a high versatility if approached with a systemic vision, can become the starting point for the creation of structures which could be easily compared to **autopoietic systems**.

2. Research background

Social, production and economic change has remarkably characterised our life in a short time, crucially contributing to the arousal of new problems. These problems were unknown until that moment, and ad to be addressed in some way (at different social levels).

Technological innovation, along with the globalisation of markets, has extended to a great number of persons the possibility to access goods and products which were not concretely available before, creating a series of problems related to **safety**, the **identification of responsibilities** on products and the **valorisation of product provenance** as a qualifying element.

During last years, in this context, the theme of traceability has come to the fore, drawing attention drastically and connecting to many subjects regarded as "sensitive" by both public opinion and Institutions.

Though underlining the difficulty to find a univocal and shared opinion about this concept, traceability - at least in the meaning which is investigated by this study – can be defined as a process taking place in the field of agriculture and food production chains. The concept of traceability was created in conjunction with the increasing interest of consumers in foodstuffs

provenance, and represents an added value assessing quality, as well as correctness, awareness and ethicality of production techniques.

A temporal dichotomy arouses when making an attempt to define univocally what traceability is, defining two separate domains. These two domains are represented by two separate concepts: **traceability** and **retraceability**[3].

Traceability is the process which follows a product, good or service, from its "birth" (and, in some cases, from the raw material stage) to the final user, so that, **at every crucial stage, the products leaves clearly identifiable "traces".**

Retraceability is strictly connected to traceability, being its mirror process. Thanks to retraceability, it is possible to **get back to the history of the product itself**, retracing its path and gathering information along it.

Besides the best-established application domains, such as agriculture, food processing and industrial process logistics, a field which is still quite new though arousing a great interest is the so called "service traceability", on which this study is focused, paying a particular attention to hospital procedures. This was due to the topicality and social value of the subject.

A hospital constitutes a highly complicated structure, presenting interpretation and management difficulties. From a certain point of view, it is a **constantly changing** structure, like a body needing an inner regulation to compensate any anomalies that may occur.

This organic, **systemic** vision as we might say, is the basis of the approach which must be adopted by anyone wanting to perform an analysis of activities and procedures inside a hospital.

The hospital is seen as a body, and, likewise, is constituted by a great variety of elements interacting with the whole system in different, **complementary** ways: besides doctors, nurses and patients, there are also other personnel categories, such as administrative staff, secretariat, technicians, medical orderlies. Finally, the patients' relatives and helpers often interact daily, though for short periods generally, with the hospital structure, playing a role which is complementary to that of patients.

The problems analysed by this study can be divided into four macro-categories:

- **Safety**, involving all aspect of sanitary procedure, including outpatient treatment, surgery, medication and transfusion bags administration, meal schedule, patient movimentation activities and procedures aimed at preserving hygienical standards;
- **Management of patients' personal details:** doctors need to have the greatest amount possible of data about the patient's clinical history, and patients must always carry with them a sometimes uncomfortable amount of documentation.
- **Logistics:** this category involves the management of materials and services flows from and to the hospital, and the so-called "patient logistic", that is the management of the patient's movements.
- **Costs** which are strictly related to the quality of services provided by the hospital, as well as to structure level, directly involve not only the personnel, but also the patient.

Particularly, this study focuses on a transversal theme for the mentioned issues: **adverse events**.

In the health system field, an adverse event occurs when, **after being discharged**, a patient undergoes **permanent damage or diseases due to therapy** mistakes or hospital inefficiency.

[3] *Fondamenti dei sistemi di tracciabilità nell'agroalimentare. http://www.indicodecr.it/prodottiservizi/index.php?id=22*

Some studies at an international level, which are comparable because they share the same methodology from the Harvard University, based on the California Medical Insurance Feasibility Study, have highlighted how the phenomenon of adverse events is widely spread, even in extremely developed countries from the medical point of view.

Particularly, these studies highlight how the majority of adverse events are classified as preventable through the institution of correct procedures, and that the total amount of hospitalisations ending with adverse events have taken place in different countries with the following percentages: New Zealand: 35%; UK: 47%; Australia: 53%; USA: 58%.

In Italy, according to a study carried out by the Ministry of Health[4], on about eight million hospitalisations in a year, approximately 320.000 patients are discharged and undergo an adverse event. Of these adverse events, 35.000 (about 11%) result to be deadly. Some studies have shown that, **40%** of these adverse events **are preventable**.

In order to fully understand the meaning of these data, it is necessary to specify that the incidence of adverse events on the balance of United States health service is estimated to amount to **37,6 billion dollars** and that the only preventable adverse events cause a yearly expense charge of about 17 billion dollars.

In Italy, the situation is not better: in fact, insurance companies estimate that the yearly charge caused by adverse events for the National Health System amounts to **2,5 billion euros**.

3. Radio Frequency Identification

RFID is the acronym for **Radio Frequency Identification**. This expression defines all those technologies employing radio waves for data transmission, used to trace a particular object, or, more specifically, to perform a particular function.

Though RFID technology has come to the fore in quite recent times (at least in Italy), it was already known from long ago. Obviously, like the majority of technological instruments which are employed in everyday life, it started developing in the military domain.

During World War II, along with the development of new Radar (Radio Detecting and Ranging) instrumentation, the British Army implemented a system called IFF (Identification Friend and Foe) aimed at the identification of aircrafts by the anti-aircraft artillery. The system was quite simple, consisting in the installation of a transmitter on board of British aircrafts (and successively also on the allies' ones).'This transmitter emitted a signal which could be captured by aerials on the ground, allowing to distinguish a "friend" from a "foe" aircraft.

However, the real predecessor of RFID was an instrument created for espionage in 1945 by Russian inventor Leo Theremin. The "bug" (or "the thing", like it was nicknamed) created by Theremin, was the first device of this kind to exploit electromagnetic energy induced by radio frequencies on a defined frequency range to transmit an audio signal to another.

Between the Seventies and the Eighties, many studies and researches contributed to the development of this technology, but the concretely implemented applications were restricted to the military field, or to the civil one, but only in the aeronautics and navy field.

Finally, in the mid-Nineties, also thanks to the acquisition of new technological miniaturization skills, fully implemented RFID system applications are available on the market. These are essentially used in the warehouse logistics and goods handling fields.

In more recent times, the attention towards this kind of technology was finally aimed at the valorisation of its remarkable development potential, related to its great flexibility of use, as well

[4] Commissione Tecnica sul Rischio Clinico. 2004. *Risk Management in Sanità. Il problema degli errori.* Roma: Ministero della Salute.

as to the possibility of integrating it with other technological systems. Thanks to these characteristics, possible application contexts have significantly increased[5].

A RFID system exploits radio waves to send data which are read (and sometimes written) on appropriate electronic supports called Tags or Transponders. The basic version of these devices is constituted by a micro-chip which can be rewritten hundreds of thousand of times, on which data to be traced are stored; a miniaturized aerial, generally made of copper or of other conductive materials, has the double function of condenser (to supply power to the chip) and of data transmitter/receiver; all this is contained in a support which, on the basis of specific requirements, can be made of different material (paper, different kinds of plastic, etc.), can be adhesive or even integrated into the object to be traced. It only needs a surface of a few square centimetres and a thickness equal to that of a cardboard sheet.

This type of Tag is a **Passive Tag**, lacking an independent power supply source. It works exclusively in Low Frequency and High Frequency mode and is characterised by a limited signal scope, as well as by a relatively low data transfer speed.

There are also two other types of Tag: **Semi-Active** and **Active** Tags, operating in Ultra High Frequency (UHF) mode and with microwaves.

Semi-active tags are characterised by the presence of an internal power source, which doesn't feed the chip directly, but other devices connected to the Tag, such as, for instance, sensors for the execution of additional functions.

Finally, Active Tags have their own internal battery and, as a consequence, they send independently the data they contain; they have a wider signal scope and a higher data transfer speed.

Besides the Tag, a FID system is made up of at least two other elements: an **aerial** which sends the signal at radio frequency and receives information contained in the Tag. A **Reader** is connected to the aerial; this is the device converting radio waves captured by the aerial in a binary language readable by any computer.

The reader feeds data to the computer, which manages the entire process, elaborating data through an appropriate software and performing functions for which it has been programmed.

As said before for tags, various models of aerials and readers are available on the market, presenting different characteristics according to their application.

A distinction is essentially made between fixed and mobile devices, that is between "gates" through which RFID tagged products pass, placed in strategic points of the process to be traced and constituting fixed points for the collection of information.

On the other hand, some mobile devices, generally made of instrumentation integrating reader and aerial in the same object, which is possible to carry or install on fork lifts or material handling carts, through which it is possible to perform picking, inventory and advanced logistics operations on the spot.

The basic functioning of a RFID system is relatively simple: the aerial connected to the reader (which will be called "main aerial" from now onwards), emits an electromagnetic field at a determined frequency and, in quiet conditions, receives its feedback signal unaltered.

When an object with a RFID tag enters the magnetic field generated by the above mentioned aerial, its own miniaturized aerial, acting as a condenser, is charged with power which is transferred to the micro-chip; when the power level surpasses a certain limit, the chip is capable of transmitting the information it contains.

[5] Vicentini, Riccardo. 2007. RFID + sensori e nano-tech. Il Giornale dell'Architettura 56: 7.

At this point, the main aerial will receive information and send it to the Reader, which, after codifying them into binary language, will send it to a computer, which will carry out all the operations established in the software regulating the process.

The above-described procedure involves the use of a Tag known as “read only”, or of a “write once & read many" tag, that is a device containing information that, once entered, can be no longer modified.

More complex systems involve a second information exchange stage, in which the reader, according to the received data, writes new data on the microchip. In this case, it is a “read & write" tag, generally presenting a series of fixed data which cannot be erased, as well as other information which are constantly updated as the traced process continues.

4. Methodology: Systems Design

As previously mentioned, this research and the resulting project are based on a systemic approach to problems.

To explain the way this work is rooted in the Systems Design principles, a short historical excursus on the evolution of scientific thought is necessary.

At the end of the XVI century and during the XVII century, new scientific discoveries in physics, mathematics and astronomy brought to a significant change in common scientific thought. Old philosophical and theological conceptions gave way to the new vision, determined by important figures such as Galileo, Newton, Descartes etc.

The interest of science exclusively focused on the study of those phenomena which were directly measurable and quantifiable, turning an organic and spiritual vision of the world into a new vision in which everything (included living beings) was part of a machine-world vision, which could be measured and quantified.

Descartes theorised this mechanistic vision through what is commonly known as "reductionism", that is the necessity to divide complex natural phenomena in simpler sub-sections, directly observable and measurable, in order to explain them.

The explanation of scientific phenomena of every nature through the principles of physics and chemistry resisted all along the XVII and XIX centuries; during this last one, also thanks to the improvement of instruments such as the microscope, the theory of Descartes provided the basis for the study of molecular and atomic science, for microbiology etc.

However, during the XX century, many currents of thought opposed the reduction of biology to chemistry and physics, through dissertations in which all living beings were seen as parts of organized "systems", which it was not possible to avoid when explaining phenomena.

The ideas proposed at the beginning of the century from these scientists are the basis of what is currently known as **Systemic Thought**, according to which "the essential properties of an organism, or living system, are properties **of a whole**, which are not held by the parts alone. These properties come from the interactions and relationships between the parts, and are destroyed when the system is materially or theoretically broken down into isolated elements. Though we can distinguish single parts of a whole, these parts are not actually isolated, and the nature of the whole always differs from the mere sum of its parts”.[6]

The element characterising the properties of an analysed system is represented by internally occurring relationships, that is ordered relationships between elements belonging to the system. Moreover, in the systemic vision, those elements have a secondary role if compared to relationships, being regarded as their sub-systems.

[6] Capra, Fritjof. 1996. *The Web of Life. A New Scientific Understanding of Living Systems*. New York: Doubleday.

Systemic thought articulates itself in terms of connection networks. According to this theory, in fact, connections characterise a system and its context, and it is through connections that a system weaves a network of information and matter. As a consequence, the vision becomes of an **holistic** type, and defines various system levels. Particularly, every system is part of a bigger system and contains smaller sub-systems. The analysis of a system level cannot ignore the context to which it belongs: for this reason, systemic thought is also known as "**contextual**".

As a consequence, mechanistic and systemic theory have an opposite approach: the first sees the world as a group of objects characterised by specific properties; though they interact with each other, relationships have a secondary importance. On the contrary, according to the systemic vision (as already said), objects themselves are groups of relationships inside wider connection networks, where material boundaries of single objects become definitely a secondary element.

During our analysis, it has been noted that the majority of RFID applications currently available on the market and, more generally speaking, industrial applications including the implementation of innovative technologies, have a linear, traditional approach, in which technology is included in a specific domain in a quite restricted, vertical way. The solution is consequently titrated to a single problem, regardless of connected elements.

This kind of approach is thoroughly analysed and highlighted as a great limitation to solution effectiveness by British expert Ken Robinson[7], who defines it with the term "**Septic Focus**", that is the tendency to see a problem as a single element, **isolated from its context**.

Through this way of acting, every application field is a self-standing element, exclusively connected to previous and successive fields. In this case, the application must adapt itself to the limits of technology and to any possible changes or adjustments; this is also valid for positive results, which will be strictly limited to the specific field, just because they were conceived excluding an interaction with the rest of the system.

This is a quite rigid scheme, where it is difficult to make changes, if not through interventions involving the application as a whole. In a structure like this, it is difficult to operate feedback when needed and to adapt to the change of a company's requirements, which occur continuously and unexpectedly.

On the other hand, the point of view at the basis of this research is the elimination of limitations brought about by a linear approach.

By applying the previously illustrated principles of Systems Design, it is possible to avoid septic focus phenomena in the implemented technological application.

The systemic application of a technology means first of all that there is no need of adapting the problem solution to the imposed technological limits; on the contrary, the instrument itself adapts to the specific case requirements. When using a systemic application, all crucial elements in a system are analysed not as isolated elements, but as parts of a connection network of which the goods, information and service flow has been analysed. The same system is seen as a part of a wider system network, interacting with all other systems. This communication can take place both between systems in their complex, and through single crucial points interweaving specific relationships with external systems.

The possible consequences of this approach are, first of all, the implementation cost breakdown between all subjects belonging to the system, as well as an **overall positive effect overcoming the sum of the single benefits deriving from vertical-type applications**, because they involve the whole system and not merely a single element.

[7] Robinson, Ken. 2001. *Out of our minds*. Oxford: Capstone Publishing Ltd.

In this way, the application is extremely flexible and horizontal to the greatest extent possible, that is referred to the whole structure. This allows a constant feedback and adjustment to make it more and more effective for all crucial elements and systems involved.

Finally, it must be pointed out that, especially in particularly complex domains such as a hospital, a methodological approach of this type generates solutions that, besides having quantifiable positive effects from the financial point of view, involve another series of benefits, which are not numerically quantifiable: positive effects in the social field, positive feedback from citizens, support to more feeble individuals; in other words, all that can be summarised with the word welfare.

In conclusion, it is necessary to point out that, though a systemic approach may seem difficult to implement, because of its apparent management complexities, it provides a further advantage related to RFID applications: every crucial element in a system is connected to the others equally. In other words, there is not a fixed departure point for implementation to make the project work.

As a consequence, various systems can be involved during successive stages, choosing freely the most suitable departure point and implementing, through the common criteria previously explained, all those domains that during the study stage have proven to have connected elements, or the contexts which, as a consequence of the network enlargement, are spontaneously touched.

5. Project solutions

The project constituting the final step of this research is the application in the health care field of a theoretical model, seeing the instrument of technological innovation not as a mere technology change inside a specific, vertical field, but as **an instrument generating systemic interactions**, where technology is the means to attain the objective, and not the objective.

The project's guidelines are the following:

- A **Systemic Approach** as a methodological basis for the elaboration of solutions.
- The employment of the same Tag to perform **more tasks**.
- **Tag reuse** for the highest number possible of procedure cycles.
- The involvement of **external systems** with respect to hospital domain.
- The possibility of implementing solutions for **successive stages**.

Moreover, some basic application devices are estabished. These are passive or read&write tags at 13,56 MHz to trace patients and objects, palmtop readers used by medical staff and a wireless Lan line installed into areas where procedures take place.

The elaborated solutions include the real-time check of the correct blood bag-patient correspondence, with automatic feedback forwarding to the Blood Bank on the actual use of the blood bag; the automatic management of refrigerated blood banks; the automatic verification of the correct administration of medications and meals. All these applications won't be managed as single solution to single problems, but as a common platform providing support to patient and helpers for specific exigences.

By extending this "platform" to the exterior, it will be possible to involve and integrate other systems inside the application, such as, for instance:

- **Transport system:**
  not only for automatic ticketing, but also as a support for weaker users, to create an integrated management of traffic flow according to the necessities of single urban areas.

- **Waste management:**
  "intelligent" collection points communicating with collectors, a "collection on demand" system could be implemented, to perform waste collection only when necessary. This system could be extended to the whole urban context; this could lead to a more accurate management of waste collection and disposal, as well as to a smaller number of movements for collection means. This would result in a lower fuel consumption, lower harmful emissions level in the air, lower transport means maintenance expenses and so on.
- **Medication management:**
  creation of a management and monitoring platform for medications, exploitable by all subjects involved in the system: industries, chemist's shops, hospitals;
- **Public Administration:**
  make available all data contained in the patients' Tags, so that Public Authorities (e.g. registry offices, municipalities and health bodies) can consult them if needed; this could be useful to speed up bureaucratic procedures and to create personalised services for subjects with special requirements.

6. Result evaluation

Making an estimate of an application such as the one proposed in this research is a quite difficult operation. This is due to the previously explained reasons, as well as to the nature of the approach and to the complexity of the application field.

On the basis of the previously underlined considerations and of the subject nature, which is clearly social-oriented, it is evident that the most important obtained results are probably the "non-material" ones, which are not financially quantifiable.

However, an attempt has been made to quantify the "material", or financially quantifiable results. This calculation is incomplete in any case, because, at the present state, it is not possible to foresee all financial effects on possible external systems involved. In brief, since the project can be implemented in subsequent stages and with no precise and mandatory departure point, the estimate is obviously not definitive.

A tentative overall financial view, obtained on the basis of present data, can help to evaluate at least partially the possible relevance of the project implementation.

For this purpose, some assumptions have been established. Through these assumptions, it is possible to elaborate a cost estimate referred to the current situation, as well as to compare it to the situation after project implementation.

The first is that, since adverse events generate a yearly financial burden of **2.500.000.000 Euros** for the National Health System**,** the total number of adverse events classified as preventable are estimated to be 40%, the financial burden caused by preventable adverse events for each of the about 8.000.000 yearly hospitalisations in Italy amounts to **125,00 Euros.**

Before going on, it is essential to interpret correctly this figure: in fact, it does not represent the financial increase generated by adverse events in each single hospitalisation (luckily, not all hospitalisations involve adverse events). Actually, it represents the repartition of the increase due to preventable adverse events, against the total amount of yearly hospitalisations, including those with no successive adverse events. In other words, it is possible to estimate that the cost of every hospitalisation to the Italian Health System is 125 Euros more, due to the occasional occurrance of preventable adverse events.

By saying this, and establishing the number of patients served by the Blood Bank in 2006, which amounts to 11.493, of which 395 in the internal ambulatory and 11.098 at the Molinette Hospital and in other related structures, the financial burden for society, generated on the basis of

the before-mentioned 125 Euros, has amounted to 49.375,00 €/year for the Blood Bank itself, and even to 1.387.250,00 €/year for other structures. This means that the financial burden for society is of **1.436.625,00 €/year**, which are an additional cost for the National Health System.

It must also be considered that, according to surveys carried out during research, about 75% of patients of the Blood Bank need to be accompanied. According to the same estimate, 25% of helpers are in their working age, so they have to renounce to working hours to accompany the patient. This generates a yearly lost income of 60.596,59 Euros.

The same reasoning can be applied to the patients of the Molinette hospital and of related structures, where, however, it has been estimated that the number of patients needing a helper is lower (20%). Anyway, this generates a yearly lost income of 227.004,55 Euros, which, summed up to the previous figure, makes a total amount of **287.601,14 €/year lost income.**

Finally, another cost related to hospital can be estimated with sufficient precision: this is the cost generated by the two employees responsible for the control of blood bags, dividing them in usable and quarantined bags. According to the estimate, the direct cost for the hospital, due to this procedure amounts to **70.000,00 Euro per year**.

The three previous figures represent three single cost entries for the National Health System, lost income and direct costs for the hospital in present conditions. Summing up these three values, though connected to different subjects, the amount of the total costs inserted in this financial account is obtained; this figure will be useful to make some important considerations. Total costs amount to **1.794.226,14 Euros per year**.

First of all, to evaluate the “To Be” after the implementation of the project, a calculation of the direct costs for the new technological instrumentation necessary to the system functioning has been made: on the basis of the previously highlighted number of patients with a medium frequency of about 24 transfusions per year per patient (defined through a survey), and considering that the price of a tag is 0,25 Euros, the total yearly cost for Tag supply would be **117.228,75 Euros.**

To this, other costs have been added: 900.000,00 Euros for new systems and technological infrastructures; 200.000,00 Euros for the change of the system management; 150.000,00 Euros for general expenses, for a total of 1.250.000,00 Euros a five-year amortization period, generating a **250.000,00 Euros** direct cost for the hospital.

As regards costs for society, it has been estimated that, through the implementation of the system, it is possible to avoid about 80% of preventable adverse events. The remaining 20% is related to those adverse events not related to the project, because they are due to a patient's accidental fall or other similar events. The prevention of those events is related to planning interventions which are not involved in this research.

The remaining cost for this type of events results to be 9.850,00 Euros per year, referred to Blood Bank direct patients (internal ambulatory) and 227.450,00 Euros per year for patients of the Molinette hospital and other structures related to the Blood Bank, amounting to a total of **287.325,00 Euros/year.**

The remaining costs to be considered are costs for lost income of helpers: obviously, it is impossible to completely avoid this cost, unless other services are exploited (a support service financed by the Public Administration; patient tutoring projects, etc.); it is estimated, however, that the application of the project stage described in paragraph 5.4.4, can reduce of about 75% the time in which the helper must actually stay into the hospital, thus reducing costs for lost income of helpers to 15.149,15 Euros per year for helpers of Blood Bank patients, and to 56.751,14,00 Euros per year for the helpers of patients of the other hospital structures, generating a yearly expense of **71.900,29 Euros.**

The analysis of the difference between present costs and costs after the implementation of the system underlines that the only increasing entry is represented by direct hospital expenses, due to the investment related to technological instrumentation and management of the new

system. All other entries, from the cost for society related to preventable adverse events, to the lost income of helpers, highlight a yearly cost decrease which, through an algebraic sum of factors (positive and negative) underlines a saving, generated by the implementation of the project, amounting to **1.067.772,10 Euros**. However, the most significant element is constituted by the **1.149.300,00 Euros** that can be saved by the National Health System (and consequently by citizens) which, alone, could justify the investment to implement the project.

Besides, it must be taken into account that the importance of highlighted economic results can legitimate any possible investment aimed at the project's implementation, even in case the real expenses exceed the estimated figures.

In conclusion, it is our strong belief that the most interesting result of the application of the systemic model illustrated in this work is not the financial one, but is represented by those benefits defined as **"non-material"**.

In fact, the advantages related to society, to the support given to weaker subjects, like elderly people and patients, at whom the research is aimed, and to the creation of a common communication platform between Health System stakeholders, as well as to the increase of safety levels in hospitals and to all relationships and possible positive results for external systems, are the real asset and added value of this project, with respect to similar implementation experiences presenting a linear approach.

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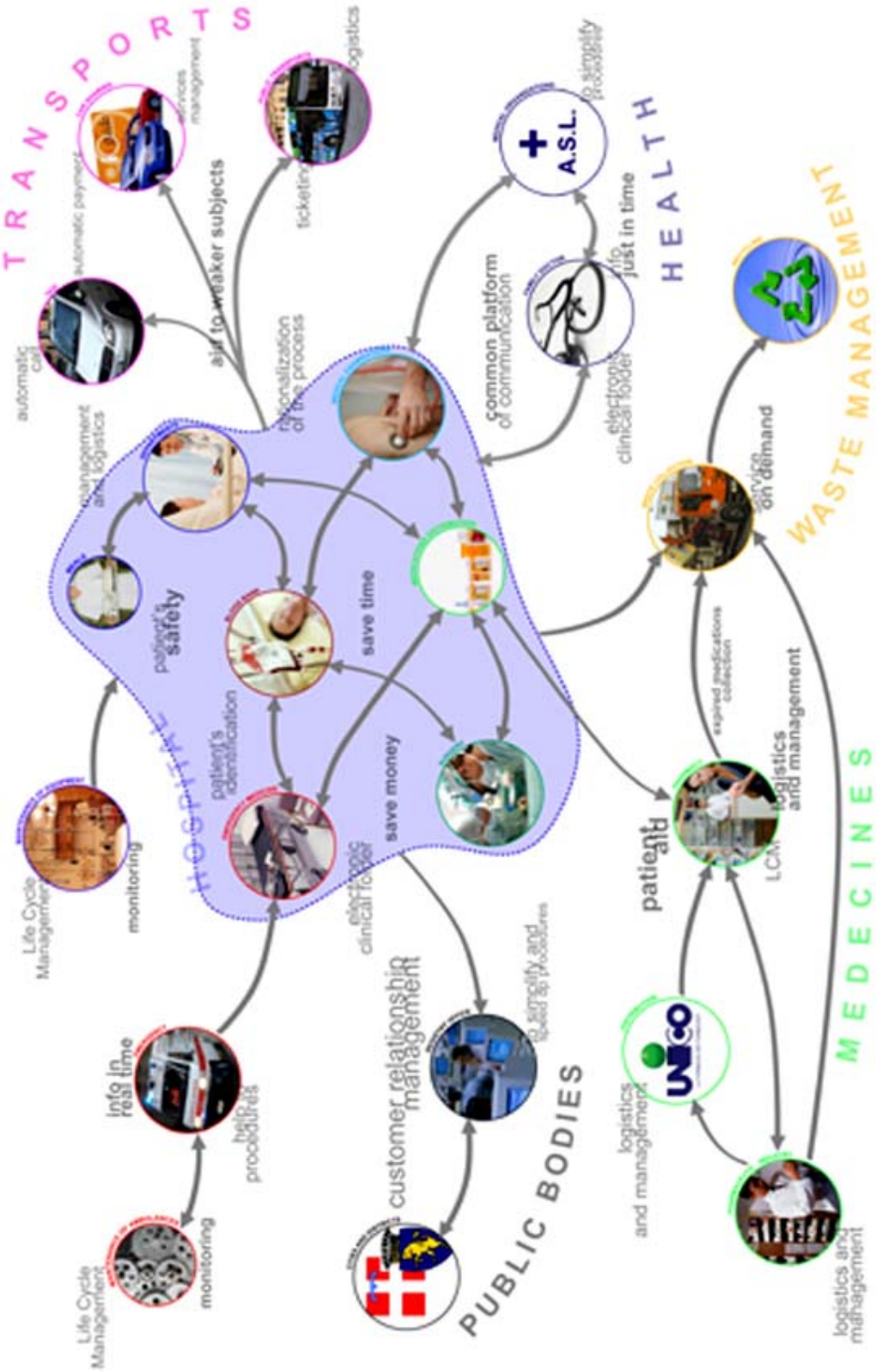

Fig. 1: Map of Connected Systems

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Business Idea Design

Supporting tools and services for start-up design-oriented companies

Arianna Vignati[1], Michele Carriero[2]

Abstract

The aim of this paper is to introduce an innovative approach to the problem of the start-up phase that design-oriented companies (project companies, and manufacturer & services companies, which are based on design as a differentiation and competitive asset) face.

The thoughts, the tools and the working method introduced in this paper are the result of a Research& Development project, carried out by the INDACO Department, as part of the "SATURNO 2007" initiative – a financial plan of Lombardia Region, Ministry of Labor and Social Welfare, and the European Social Fund, coordinated by the Lombardy Chambers of Commerce and Unioncamere Lombardia, and ended in February 2008.

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1. Introduction

The creation of new companies has always been a significant data for the economic development of a Country. The social and economic dynamic which are positively referred to this factor are related to the generation of employment and most of all to a tight relation between new companies and renovation/innovation of the industry in which they operate (Dringoli and Boccarelli 2004). In fact the new companies are more and more a trigger for the introduction of new technologies, and for the product, process, service innovation. And not only. More often new companies support the traditional ones in terms of offering innovative service and in terms of diffusion of incremental innovation in the production line.

The "micro-entrepreneurship" phenomenon, meaning the creation of small and very small companies, especially in Italy, is partially due to the parallel phenomenon of reduction in the number of employed by the big companies. To be ambitious, have ideas and to be eager to face challenge means, in our country, to often deal with the challenge of starting an entrepreneurial or self-employment action, as it would be difficult and different to do the same things when employed by a company. In Italy this eagerness leads to the creation of 400.000 new companies per year[3], bringing our country among the leaders in creation of new companies, especially individual and small companies. When looking at the current economy, it is evident that a successful innovation, which generates a long-lasting flow and a consistent economic value, rises from individual initiatives that can gather a system of skills, ideas, opinions, attempts (a wide network of companies, bureaus and institutions that get more and more over the regional and national boundaries). In fact, it has been some time since innovation was coming from an isolated inventor, of from the R&D process of a single company (Plechero and Rullani 2007).

In the current competitive context innovation, thus that push and that chance at the basis of all business and entrepreneurship opportunities, is (and it will be even more in the future) an emerging factor (rising from opportunities and circumstances tied to different real factors), very dependent on contextual circumstances and especially to the *animal spirit* (as Rullani defines them) of the people involved. The innovation is developed in an area between the technological and economic system. A sort of "no man's land" where the processes don't follow any purely technological and economic logics (Plechero and Rullani 2007), but where individuals and their knowledge are determining factors. The level of innovation of a new business as well as the growth opportunity in the years after the start-up depends on these assumptions. The continuous innovation process is crucial since the very beginning. An innovative process where the capability of making decision is very important. The new businesses have to be based upon innovations rising from the ability to envision, and to create shared meaning, and generate virtual worlds. These variables derive from the creative skills of the subjects, which are at the basis of an innovation process (Plechero and Rullani 2007). This creative skills aren't improvised manifestations of the individual fantasy or brilliance, but they become the way in which the intelligence of people and organizations deals with complexity, trying to find its meaning in its growing process.

The space of new and possible is opened and accessible to innovation, to become the space for everybody's freedom and experimentation, which through rules and relations are reshaped in maps an reusable networks (collective intelligence) (Lecy 1996). The open innovation (Chesbrough 2008) becomes the *modus operandi.* The design companies and those that base their innovation on design have in their DNA the competencies and knowledge to make it "daily active".

A crucial role in this collective intelligence and in this open innovation model is played by the human capital, which in the creation of new entrepreneurship significantly contributes in long-term innovation: the entrepreneurial development is in fact the growth engine of the network. As

[3] According to an investigation by Unioncamere published early in 2008, and the data Movimprese 2007, 436.025 registrations were made in 2007 (the highest since 1993, when the investigation was sterted).

Stewart states (Stewart, 2002): *No tangible goods are needed to access to an entrepreneurial activity. The special and differentiating asset, isn't the machinery: it is software and wetfare (neologism meaning "humid goods", to indicate the brain) […] There was a time when the possibility of gathering material assets used to determine a competitive advantage and explain why the companies were established where they could use the physical characteristic of the territory […] In terms of material assets, purely knowledge-based societies (such as professional services companies, publishers and financial groups, not to forget the internet and design companies) can have requirements which don't go far beyond some computers and desks.*

This introduction on the competitive and economic context which for the years to come will represent the path which many and new companies will have to follow, allows us to look at the phenomenon of the design self-entrepreneurship as an original and innovative element of the whole industrial system. This because design, especially the Made in Italy, has always been a complex system of services supporting business innovation, and the core of the market competition.

1.1 The creation and growth of design oriented companies

The business start-up, especially in the first and most difficult years, brings innovation and positivity to the economic system, but it is also quite critical. Its issues are tied to several factors: inside the company (training the entrepreneur, finding the qualified human resources, organizing and managing etc...) and outside the company as regards the turbulence of the market (legislative changes, changes in the interest rates and in the cost of raw material etc...). Since many and different factors influence, even dramatically, the stability of start-up companies, several actors have nationally activated policies and projects to support these issues. The principle of these initiatives is bases upon the firm belief that to support institutions and universities can lower the impact with these difficulties and allow the young entrepreneur to find their way in the scenario of the global competition and open innovation.

It's been a few years since, in this framework, Regione Lombardia (through fundings of the European Social Fund and the Ministry of Labor) has activated Saturno, a project to support the business start-up in Lombardy. 25 Lombardy operators participated in the call in March 2007 and, on the basis of a unitary proposal by the Chamber of Commerce, as many projects were activated.

The Business Idea Design (BID) project, promoted by Dipartimento INDACO of Politecnico di Milano, supported by Organizing & Consulting[4], was part of the initiatives "Saturno 2007" and focused on the investigation and testing of tools and methods for the creation of design oriented companies (design companies and companies aiming to base their competitiveness on the design driven innovation).

The aim of the initiative was to support 15 start-up companies with significant innovative contributions to the service design sector and to traditional sectors, leveraging on product, communication and service design.

The BID project also allowed to define a model and a service, education and consultancy platform to support these typologies of company.

2. Business Idea Design: tools and methods for the start-up of a company

[4] Companies that carries out supporting projects for the business creatin, especially in the disadvantaged areas in the South Italy

The Milan and Lombardy areas are an extraordinary fields for continuous innovation for the Design System. In the Milan and Lombardy area there is a high concentration of design schools, design companies, professional associations and design related services. This is why new design companies and companies which use design as a competitive asset are created and grow here more than anywhere else in Italy. More in general there is a substantial trend, in this very particular field, as regards the design discipline: design is leaving once and for all its dependency from the production and consumption system, to find its way towards a wider system of values. This system shares a life project socially and environmentally sustainable, and it plays a proactive role, able to generate shared wealth scenario (Zurlo 2003). In this logic companies have recently been created (and the phenomenon is increasing), thing which opens up new cultural, social, civil problems (Bucci 1998).

The Business Idea Design project allowed the identification of a supporting action to design startups, divided in two main business typologies and models:

- design companies: they base their core business on the offer of design related activities in all the design fields (product, interior, communication, etc...)
- companies that use design as a competitive asset: they use design (at the product system level) as an innovation and competition element in the traditional sectors or the new technology and new economy ones.

On the basis of these two models, the project laid the basis for creating a platform of services, education and consultancy, to support the design startups, and generating the condition for a future interaction model.

2.2 Education: management and design

The education and training of the human capital is one of the crucial elements to support the business development. Some studies have shown that a specialized university education risks to lead to a reduction in the entrepreneurial development in our Country (which was until recently supported by a wide and multidisciplinary university education) (Femminis, Martini, 2004). Thus, knowledge transfer and education had to be the basis of any action to support the company start-up.

The first step in the activities suggested and organized within the BID project referred to the definition of a short educational program targeted at groups, which would focus on the knowledge transfer in the management and design areas and on sharing the business ideas. The candidates (around 40) studied topics related to strategic design, marketing, communication, distribution and business organization, and used the suggested tools and innovation models to reshape (and in some instances radically) the business idea. The interaction within the class allowed an ideas cross fertilization which in the following months helped establishing a stable interaction network. At the end of the educational program 20 innovative ideas were selected, to be developed in a further step: organization and definition of the business plan.

2.3 Consultancy: evaluate the feasibility of the idea and define the business plan

The premise for any activities of evaluation of the business ideas is the evaluation of the innovation degree of the idea itself. The opportunity to start an investigation to define a business plan has to start from a real evaluation of the possibility of success of the idea. The more the possibility of success is foreseeable the more the qualities of the entrepreneur are intelligible, the more the role and the identity of the company in the society and market of reference are clear (Zurlo 2003). The mission, the strategic plans and the actions of a company have to be based upon a unique factor, and not only upon a competition. The competitive advantage doesn’t come from a differentiation effort, but from exploring unknown dimensions. The more this advantage is acknowledged and shared, the more the strategy needed to be gained it will be clear. The 20 potential entrepreneurs were led to the definition of the business strategies in a series of personalized revisions, during which the economic and financial information of the initiative were evaluated. Scheduling personalized meetings allowed to:

- isolate and clearly identify the business idea and to clarify the suggested focus of innovation (in comparison with the market and the current economic system and with a vision of what it could become in the medium-long term);
- once the business idea was defined, carry on with:

  1. verifying the technical and economic feasibility (through tools of economic analysis);

  2. creating the network of actors needed to activate the business (with special attention given to the relation with the Design System and the management competencies).

The creation of synergies among young designers and potential entrepreneurs was strategic for the success of the project, many of the business ideas in traditional sectors were in fact created by entrepreneurs with a strong technical background (mainly engineers), which would consider design as a determining factor for the competitiveness of the new product/service, but which didn't have any competency in the field. The BID management team had to enable the relation among potential entrepreneurs who, since the very first steps of the business development, worked together with designers, who could visualize and communicate the visions on the product system.

On the other side, to support young designers (designers, architects, communication designers) in their company start-up meant to focus on supporting the management and organization model of the new business (contracts, company architecture, managing the investments, etc…). the synergy among the competencies of the potential entrepreneurs also allowed to define shared innovation platform.

2.4 Services: community building and network creation

The Business Idea Design project was developed according to the process and constraints given by Regione Lombardia to all the operators. At the same time as the educational and consultancy program, the team developed a service to support and stimulate entrepreneurs to grasp logics of continuous and open innovation. This support was developed in two different services: funding opportunities search and involvement in research activities.

The regional and national funding opportunities for start-up companies and research projects involving universities and SMEs were constantly monitored, and companies were helped and supported in writing and filling the participation forms. Thanks to this service some companies, even after a month since their creation, were financed without security, or at a very convenient rate.

As regards the participation of the startups in networks of innovation and research, the newly born companies were involved since the very beginning in research and collaboration projects between University and SMEs. This allowed to strengthen the platform shared by University and regional production, and to make the process of technological innovation accessible to the new companies.

The result of the BID project was the creation of 15 innovative startups and of a community building platform coordinated by the university. The platform is part of a wider network of actors operating at a national and international level (incubators, research centers, companies accelerators, scientific and technological parks, etc…), aimed to support the creation of new companies. With one specificity: design.

2.5 The strategic areas of the startups

The strategic areas of the startups are many and different. They draw an interesting picture of reference for the direction that design might have in the future of the national economy.

Integrated design: **Marchingenio,** company that combines the design competencies (the participatory design and the development of sustainable projects included) with the architecture and interior design and the development of "key in hand" solutions. They not only suggest projects, but define themselves as "the bearer of new cultural scenarios" focusing on energy efficiency, material and space sustainability, individuals' psychophysical wellbeing. Web services: Diego Giuriani created **MyVetrina.com** (www.myvetrina.com). He was able to leverage web design to create a stable network among companies in Valchiavenna (area with several logistics problems, which is thus very suited for technology-based services such as this one). New product solutions which aim to take to the extremes the relation between crafts and haute couture: Gabriella Frigerio (young fashion designer with a wide experience in the prestigious haute couture brands) created **G:Lab_27** and designed a hand made collection of bags. The collection takes the role of the high quality handicrafts in the Como area to the extremes of the production for international market. Products for specific users: **Aquabrik** (fig 1) gets in the swimming world as an innovative system, which opens up new frontiers in the field of the psychomotility of specific users (children, people with handicaps etc…) and in the field of the post-surgery rehab. Products combining technological innovation and design: **Rizlab** is created as a new young company designing and producing integrated computer systems within design solutions. A Lab in which original ideas are developed and translated into computer tools characterized by the use of unconventional shapes and materials (through a continuous research, extreme customization and attention to the current trends) (fig 2). Specific design consultancy for SMEs: The **muvin'** product manager is the new profession created by **Paola Marincola** to answer the need of SMEs to manage the product and communication innovation process in a strategic way. The concept is to take the idea of "open innovation" (Chesbrough, 2008) to its extreme, through a flexible and moving figure tied to project management. Products for specific users: the specialization in designing and producing playing grounds for children (especially normallyintelligent ones) is the core business of **Stileurbano**. Design for food: packaging, innovative banqueting solutions, food design are the focuses of **Boxing catering** and **Le Kanary**, companies in the catering and food fields. Identity communication, branding: the company communicates its identity through the integrated communication of its value, offer, innovation, etc…; **Visulamade** offers communication design services especially to SMEs, exploring the new virtual communication world such as Second Life.

3. A network model for a stable relationship between University and new design companies

The service, meaning the relation among the different actors of the production line is currently very important when talking about innovation (even though for several years it was considered a useful but not leading activity, like those which "consume" the added valued produced by others) (Rullano, 2007). In order to innovate, exploring the world of what's locally possible in an immaterial way, producers and consumers, specialists and system analysts, material and immaterial, local and global have to be *linked* in a dialogic manner, mixing the traditional manufacturing and services roles.

In order to create all this it is necessary that the innovators act within a network that makes others' knowledge and production resources accessible (which then allows to share the weight of innovation costs and risks). In a polycentric system where innovation reaches different point of a network a self-organized management system is needed. In this way, the pioneering innovation can be amplified and become fruitful by the propagation in the network. The propagation is managed by leaders and public policies through a process of self-regulation and bottom up (Rullani 2007). In this vision of the innovation model, in which the newly born companies operate, the University plays a pivotal role, like a ring in the chain that can spread information, knowledge and innovation.

Once the Business Idea Design experience ended, the aim of the project's evaluation process was the test and possibility to shape the network. First of all a network among the project participants, to create a stable dialogue between new companies and University. An internal network which looks outside, at a model of continuous innovation and at the support to the creation of new design companies. Several design and research occasions, activated within the University, have actively involved the new companies, putting them in relation with SMEs and systems of national, and in some instances international, companies. The model upon which the network is created involves several actions:

— Knowledge transfer (good practices, innovation and new research boundaries that the University puts at the companies disposal);
— Consultancy (support to the definition of new design business ideas and design business plans);
— Services (support to the identification of bans, funding and research);
— Stable network among startups, innovative companies involved in research and applied research processes and university (community building).

Final objective of this process to build a stable network is the development of a virtual space to give visibility to the community of young entrepreneurs and that could be involved in a wider network of relations among designers, companies and universities. Besides the support given by a technological tool as a platform for knowledge sharing, the life and growth of the network depend on two main variables:

— The first is the human capital, the basis of any organization and any model of know how and innovation exchange and transfer;

— The second is the organization institution, which together with the University, manages the communication platform and the service supply. To support the company accelerator at Politecnico di Milano (Acceleratore d'Impresa, AI), together with the educational activities of the Facoltà del Design and the research and innovation activities of the Dipartimento Indaco, the developed model suggests a subject which can act as a reference point for potential entrepreneurs (first of all young design graduate) and the new startups. (fig 3).

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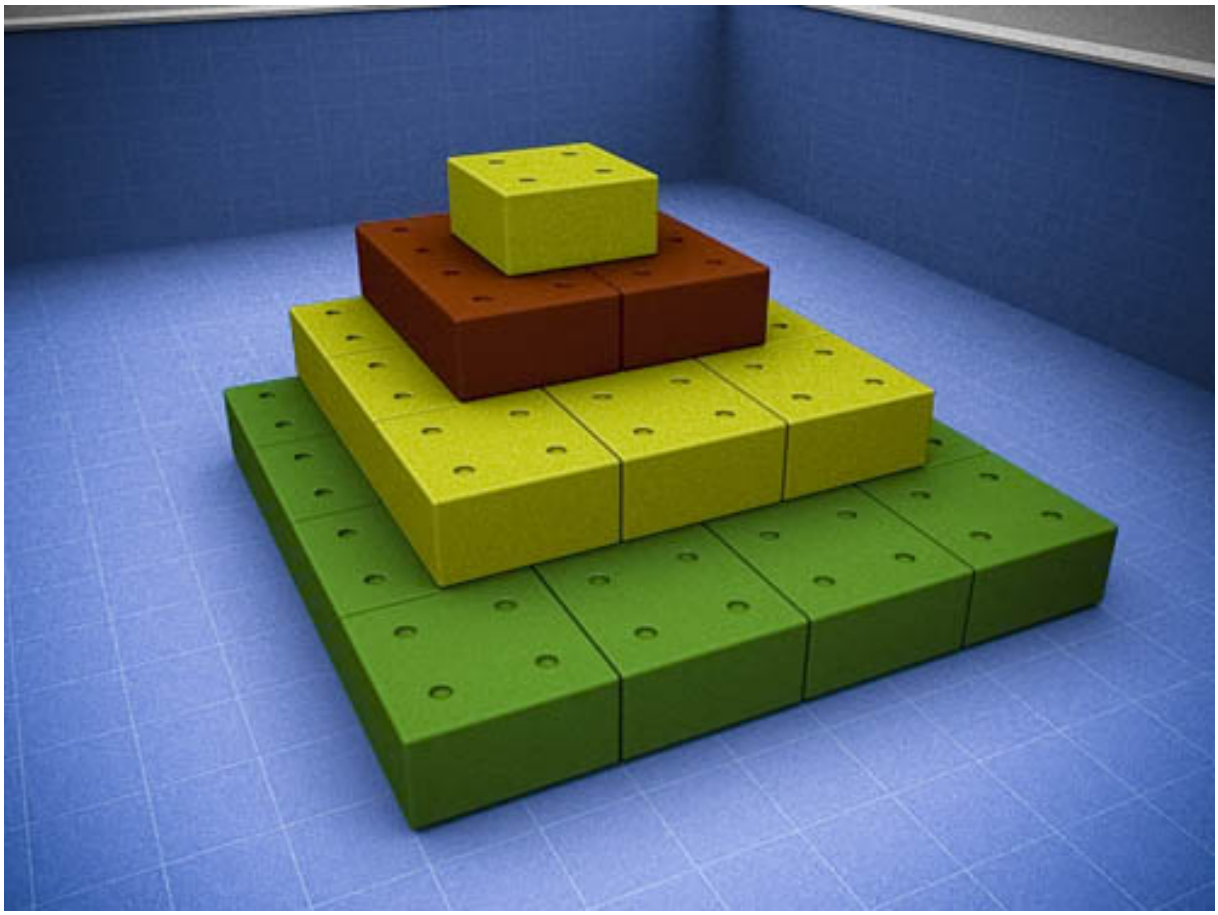

Fig. 1: modula system for the psychomotility in the swimming pool, by Aquabrik

Fig 2. Ultra compact case produced by Rizlab

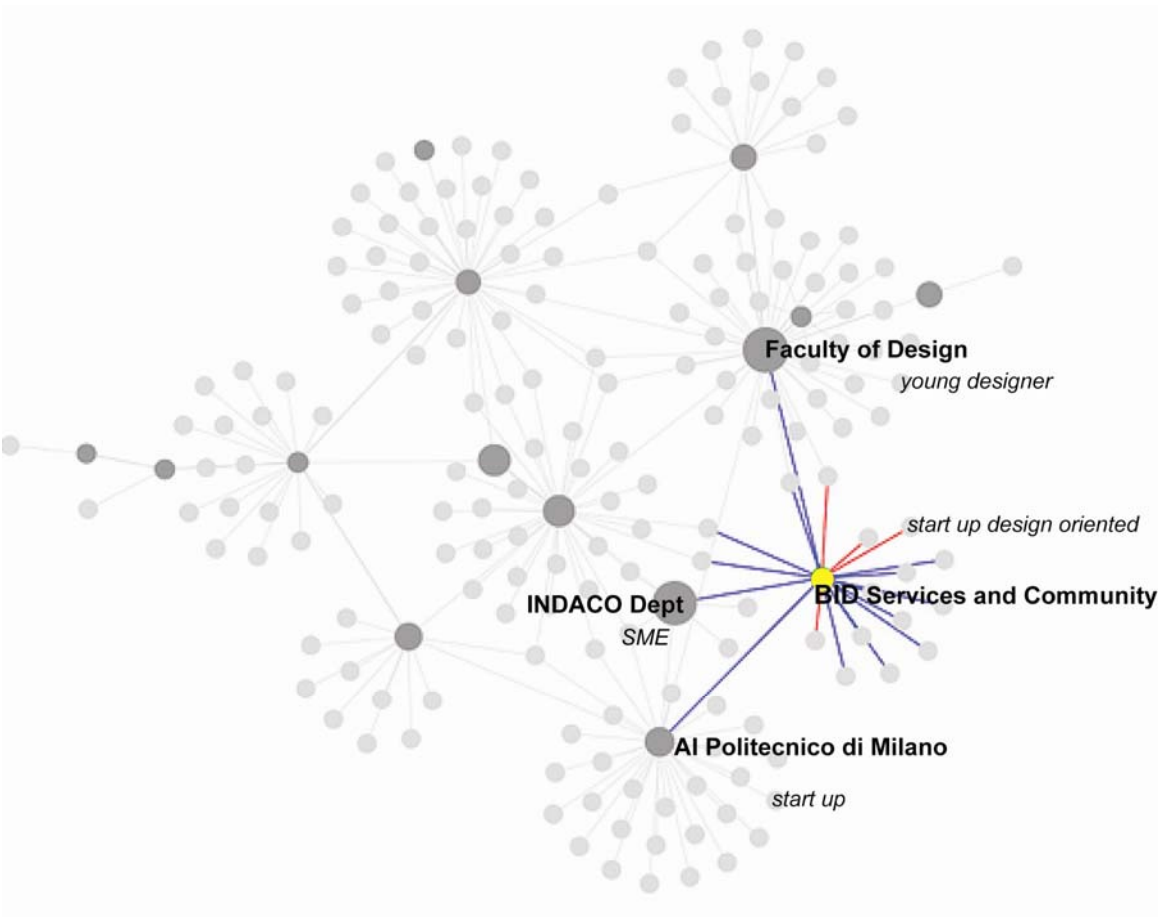

Fig. 5: Network model suggested at the end of the BID project

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Design by Components

An operative methodological tool for the ecocompatible industrial design

Andrea Virano[1]

Abstract

While until yesterday design development processes were based on the creation of few product families, today the increased welfare and the abundance of a product-park overloaded with objects, is asking for changes in the way of “doing design”. Recently there has been a clear need rising, the need of adopting appropriate strategies/tools/operative methodologies, so to redirect industrial productions towards quality and not quantity. In this always changing scenario, the Design by Components methodology propose itself as a powerful instrument supporting the environmental sustainable industrial design. Through this tool, that follows the concept of the reverse engineering, it will be possible to get to a redefinition of new design criteria able to meet the current environmental needs.

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1. The methodological tool

The methodology presented in this paper is the synthesis of many experiences gained over the years, through courses, national and international workshops, by the industrial design work group of *DIPRADI*, *Politecnico di Torino*.

It is necessary to show a simple but involving approach, if we wish to show how to work.

We start by concretely dismantling a commercial product, interacting with an object, not only theoretically but for all purposes, triggers a mental and operational process leading towards a deep understanding of the same object, the technologies adopted and of the planning process.

By dismantling the product it is possible to perform a spontaneous application of the so called “reverse engineering”, that being an operation enabling an understanding of the problems arising from the analysed product. The dismantled object must be, therefore, represented in an exploded axonometric view which highlights all its parts and peculiarities.

If, on top of this analysis, we add all the materials the object is made of, it is possible to see on the same table all the parts it is formed of, ease or difficulty of disassembly (caused by several issues, such as the one of safety) and materials. As a result, we can perceive the object in its complexity.

Before it was only a shape, now it is no longer just that: it is a component system.

This different type of focus allows us to understand the “underlying whys and wherefores of things”. The following step is to define what its components are.

The component is the resolution of a function (an electric wire is a component, for it transmits electricity; a switch is a component, as it “accepts or refuses” the passing of power through a wire). At this point, the understanding that we have gained makes it possible for us to outline the general operation scheme of the product, without analysing any further operating object, and to relate the several existing components, getting to its essential scheme, once we have understood all its possible redundancies.

If we analyse them within their homogeneous whole, we can see how each table focuses on specific analysis. The awareness of the complexities observed, results in increasing knowledge, that is fundamentally important, because we can confront ourselves with a concrete reality where all the theoretical baggage suddenly materializes.

The theoretical study of the manufacturing technologies is extremely useful and educational, but even more beneficial is to see and handle the produced parts, as we can immediately discern all the problems we could not see before with one’s mind’s eye.

With this approach, it is possible to observe a foamed component or an injection mould and to understand all the problems arising both from its realization and its assembling. We can see bulges, indentations or supports and we understand the reason. By touching screws, washers, joints or gaskets we can guess how easy or difficult it will be to assemble or dismantle them.

This is “learning by doing”, it is like going into a craftsman’s shop, seizing his secrets.

Moreover, by dismantling the object, figuring out what the difficulties may be and reporting the latter on the tables, we may understand the different existing types of users, such as production users, management and maintenance users and consumption users.

This means there are three types of accessibility, production staff must easily assembly parts, management and maintenance staff deals with disassembly and repair difficulties and users wish to use the produced goods as long as possible, as well as doing small repair works.

If we look at the matter from this point of view, also components will take “different” positions which can, however, generate planning benefits.

The explosion of parts, that can be illustrated on a disassembly table, is not very effective if it is considered individually, uprooted from the relationship occurring with the other ones. Instead, if

single parts are conceptually connected, one with the other, so as to understand their functions, it is consequently possible to materialize the different components.

Combining previously undifferentiated portions may now determine well-outlined “focuses”.

A component table has to emphasise the individual functional parts (components) forming the product and has to help, in such a way, to detect and determine the relationship occurring among the parts, that being the possible general working scheme.

The above mentioned scheme becomes easily discernable once the relationship and assemblage system of the different components has been fully understood.

Cross-reading the tables, starting with the initial complexity, until the final essence, caters for the ability to relate all the pieces in such a way they can actually “communicate” with each other.

If such communication is coherent, we can easily provide a detailed analysis of the object in question.

It is now possible to configure an essential scheme which can, differently from the previous one, eliminate all the redundant parts and volumes. This synthesis leads towards an abstraction, by means of removal of the formal waste concerning the previous product, and open the way of a new coherent planning system, operating in compliance with the components, that are indispensable in order to perform a given function. It is the first synthesis of the object.

The following step takes place within the specific filed of cognitive ergonomics.

It is the subjective definition of the perceptive and emotional contents, with reference to the essential scheme of the identified components, that this time have been analysed from the user’s point of view. Following this additional but essential detailed study, we can configure and outline the guidelines, inferred through the different passages,as requirements for: the end-of-life cycle, the right interconnections among components, the good maintenance and management, the functional relationships and the perceptive relationships of the new product.

The shape raising from a number of analytical passages, entailing choosing among different possible solutions, will not be the creation of an extemporary imagination or of a preconceived idea. It will be the result of a well conceived and aware planning process and the object produced by these detailed analyses will be the result of a conscious choice, with regards to functional, technical environmental and perceptive principles.

An example of the results that we can achieve applaying this methodological tool is the wall gas boiler. Over the years the object has lost its peculiar connotation and its original machinery appeal. An initial formal decision caused the whole planning process to adapt itself. This consisted of a parallelepiped to be hidden inside a wall or a piece of furniture, but, can a burner or the fire configure a parallelepiped shape?

Only by dismantling the boiler one can figure out what the product-related problems may actually be. When we analysed a boiler we saw that, in order to get to the expansion tank (that being the part that blocks the whole system, in case of damage) in the occurrence of a breakdown, it was necessary to dismantle the whole object. Time, materials and electric power waste related costs, become unaffordable, not only for the expenses users need to face, but also for the environment.

An expansion tank is the “lung” of a boiler and of the whole heating system.

Also its shape ought to be conceived bearing in mind what its function is. It ought to be circular, rather then elliptical or, even worse, square, so as all its points receive the same pressure, not any lesser or more. By placing the expansion tank in a comfortable position easy to reach, the whole object may have a whole new appeal. Why does a burner need to be rectangular?

Bearing in mind the fire is not rectangular, it is appropriate to consider that also a burner will be shaped in a way to be strictly connected to the movement of the flames, rather than the one imposed by the need to hide the function in a box, as if to conceal it.

The planning process is now winding, as parts making the whole are analysed on two different fronts, those being the individual components and the relational system occurring among them.

The synthesis of the two results in the product.

Nowadays, the manufacturer entrusts the designer the only task to refine the previously ordered shape, and to dress up a technical set, just like when an architect conceives an architectonic shape to be raised by someone else.

The designer is not a stylist, at least not according to the meaning and definition the word is currently given.

We may have forgotten that, in the past, a stylist was a tailor sewing clothes himself, or a sheet metal worker shaping the car he had himself built, with a hammer. The first coachbuilders would have never misplaced a component, as it was their job to dismantle and fix their own creations.

Changing attitudes would probably help solve many problems, with ease and deeper awareness.

It is necessary to create a widely spread culture in a planning, technical and production field, that belongs expressively to the individual actors of the whole production chain, where everyone is aware that a new “know-how” is being achieved and shared.

If we have “strong” components that are endowed with a strong identity, we will not always need to dress them. The possible aggregation will differ from the one that is currently provided for and, as a consequence, also its dress will have a relevant connotation; it will no longer be a mere cloth used to cover pieces of furniture during the seasons when we do not use them, or an “installation of Christo”, but a veritable outside shell, coherently designed with the inside.

2. Didactical testing

It is difficult for a learner to understand how to move confidently within a planning filed, as he has not gained enough experience to proficiently approach such complexity. Every time he ought to make up his own strategy.

In this chapter we want to underline all the different passages of this operative methodological tool in order to explain step by step how our students approach to the project.

Gathering information regarding an object for use, begins by making currently existing knowledge explicit. It may be effective to note and photograph, together with a table approach to the object, how to use it, the performed functions, the environments affected by its operating, and in general whatever exemplifies the culture we have, in relation to the objects analysed in the study. Disassembling the object is the first step to make if we wish to get close to it, to be in tune with it and understand it. Through an analysis graphed by means of an exploded axonometric view it is possible to highlight all the elements the object is composed of, the materials and all the different kinds of tools used for the operation.

The accessibility analysis table looks at the different elements identified during the dismantle and classifies them according to the degree of ease, the order in which they can be dismantled and whether the latter operation needs to be performed by the user or the maintenance man. In addition, this table serves the purpose of revealing all the different connection modes, such as screws or rivets, as well as to find out if it occurred by aid of joints, bonding agents or welding. As a result, we can check whether an individual element may be disassembled or if we absolutely need to destroy it.

The analysis of the components delves into the parts the dismantled object is made of. Such parts are arranged and classified so as to identify the different functional systems which contribute to define the performance of the object. Components are the elements, or sets of elements, endowed with those functional features which help the object achieve its objectives.

The current working scheme of the object explains the connection occurring among the parts during the operation and makes them explicit. It pays particular attention to the inputs, the flows running inside the “object system” and to the generated outputs.

The general scheme explains the connections existing among the different components. Flows, connections and circuits existing inside the object are arranged and organized in order to emphasize the areas to be used for individual functions or groups of functions. The initial object is now totally dematerialized and schematized by the whole collection of systems enabling its operation. In this way we have moved away from its initial shape. We have lost every connection with its look, that is its “shell”.

The essential scheme is the maximum possible synthesis. It is composed of the main components, that cannot be eliminated if the functional qualities of the object in the study are to be preserved. This scheme detects all the components and fundamental relationships system. It is now possible to rethink of the object free from all formal and cultural ties. The “shape” of the new object will be mainly determined by the features and organization of the components that form its essence.

The table referring to the correspondence between shape and function examines each component and its functional features in relation to the formal characteristics. This assessment aims to find out the existence of any kind of correspondence between the two aspects and identify if the shape is generated by the function performed by the component or by other factors. Other aspects are being evaluated, such as the possibility that adjacent components may be formally inconsistent or contradictory with each other, as well as how the object can possibly be improved, aiming to increase the level of performances or make maintenance and disposal easier to accomplish.

The perceptual and sensory analysis explains the way components and functional systems are perceived by the user, on the basis of the general scheme. This analysis shows the importance of understanding the diverse aspects of the interaction between users and components.

The survey on the emotional relationship between the user and the object points out what the users’ functional expectations are, with regards to the object. The emotional analysis supports and completes data gathered until now, showing the need to move on by making on-going “zooms” back and forth from detail to general.

Inquiries on objects for use cannot be restricted to the object themselves. We need to go in depth within the background analysis where they are adopted. In this way it is possible to deepen the knowledge of users’ uses and needs, the times and the modalities of use and the link with the environments where the objects are used. The more this analysis is deepened, to the point where it represents the foundation of the project, the easier it is to define new elements concerning the use and traditional functions with regard to the initial object.

Guidelines summarise the new requirements deriving from the previous analysis and form the requirement table of the new product.

After a detailed study of every single passage, it is worth noticing how, by grouping them together along a logical/planning sequence, it is possible to really see how a designer’s mental process becomes articulated, when applying a methodology of Design by Components. Alongside the previously defined general and essential schemes, possible solutions are now being individually looked into, thinking in terms of parts, components or areas of influence. Each solution needs to be commented on, reporting both positive aspects and possible criticalities or degree of severity.

We are now provided with a full range of well thought-out possible solutions for each point examined; we will need to rely on these indispensable tools, whenever we make planning choices or during the feedback. The appropriate modes of representation, the use of models of study adopted to assess the object individual features in details and comparing them with different users, enable us to approach a more objective verification of the solutions to select.

Once we have chosen the selected solutions, we proceed by acting on the initial scheme. As we go along, the project acquires physicality, dimensional characteristics and some of the qualities and properties of its parts are outlined. The on-going assessment of the choices made, jointly with the notes written directly on the drawing, allow us to verify the appropriateness of our choices and to possibly test other solutions.

Communication of the project has to be displayed by means of front, side and top views, providing thoroughly explained details and sections, in order to gain deep understanding of all physical-dimensional aspects of the object. Using axonometric displays (preventing measurement distortions), producing real scale models and other types of layouts (exploded, films and so on) may help remarkably in visualizing the project.

The choice of production-related materials and technologies will occur only when the object performances and quality have been appropriately defined. The designer can now, objectively search for interesting opportunities, free from constraints and conditioning; under other circumstances we risk to rely exclusively on the technologies and materials we are already familiar with.

3. Design by Components, other possibilities for the tool: application in architecture

The planning researches, that have been carried out up to now, have been interpreted as experimental chances of conveying know-how from the field of design to the one of architecture. The approach of Design by Components (also in the architecture field) requires that the answer to a planning related question must be obtained through a process, which starts from the definition of a complex relational scenario, concerning the specific thematic area we are going to act in.

According to the ecodesing principles, where it is regarded as a transversal discipline of an object conception, planning and production activities, each existing serial product can be considered as a an interrelated and complex component system. The methodological tool of design by components makes problems readable and analysable according to a logic including all possible cultural and scientific contributions, which are brought also by specific experts, intervening with the objective to provide the designer with further support. The emerging scenario presents complex features rather than being characterised by disciplinary monotony. At the same time, the targeted users directly or indirectly involved in the fruition process of the products, are under analysis. The human factor is an additional variable which makes the problem remarkably more complex, it outlines further performance needs which are related to the nature of the perception of the product. The processing of the production and consumption scenarios determine further performance needs connected to the quality determination of the product, from an economic, sociologic and environmental point of view. It is up to the designer to analyse this complex system of required performances, as well as to identify priorities and emergencies.

The previous experiences, culture and ethics, jointly with the ability to go beyond the apparent cultural borders, traced by the schematic subdivision of knowledge, are important tools for the designer. Firstly he uses them reliably and knowingly to define the families the previously outlined objectives are in relation with. Secondly he analyses the nature and the mutual relationships and chooses the most appropriate metaplanning configuration, this research will go on through subsequent re-deliberation processes until the moment the designer faces planning definition and execution phases. The innovative aspect these themes have helped experiment, is

the new consideration of houses and existing architecture, equal to any other serial product. They are therefore, regarded as complex systems, which are as such, decomposable in functional and then in essential schemes, to be subsequently analysed.

In the following text are presented four cases (reserches and applications), that would represent a critical testing contribution and should be considered as a useful dialogue proposal in order to start a positive and constructive contamination between parallel fields of architecture and design.

The Motor Village project[2] in Mirafiori in Torino, Italy.

The work group had to decide if it was necessary to demolish an "old" industrial shed for realize a new structure or refurbish the old one, in order to realize a new nodal point for *FIAT*, creating the prototype of *FIAT* branch office all over the world.

The whole building has been carefully examined in its state-of-the-art conditions and the "broke-up" into parts and components. This approach has enabled the work group to understand the elements to be changed and those to be preserved. This situation arised, as it usually happens in the event of common use products, because of the presence of one-sided parts: certain components could be used as they were, others couldn't. The planning group delved into the structural whole that showed to be made of a metal framework, with a roofing in pre-insulated/corrugated metal sheets panels, perimetric walls made of brick with steel wire drawn frame and bar windows. In this case, the planning group did not proceed by replacements of components. We understood, on the contrary, that it had the chance to intervene following a precise logic. The architecture, an old "shed" structured saddlery, consists of repeated modules made of columns and two pitches.

Instead of taking the "low-high-low" module of the cover, according to the scheme, the group, on the contrary considered the "high-low-high" one, according to the scheme, by simply sliding the modularity by half a span. This reinterpretation has radically changed the perception of the whole, also reinforced by the underlining of the perimetric walls which have also undergone this change in perception: going from to, the module obviously broke in half and radically changed the global perceptive approach. Alternated full brick painted backgrounds with other empty ones (new full field windows) have once again helped consolidate this view.

This allowed us to give to an "old" structure, in the process of being demolished, a new life, and, at the same time, this way to proceede could become a model to reproduce, when dealing with the planning and construction of other "old" industrial buildings.

Maintenance in popular building trade[3]

The turning point for an environmentally and technologically sustainable future, consists of the opportunity to approach maintenance with a substitute logics, where the greatest number of obsolete and damaged elements are replaced by new products and components that are obviously up-to-date. This would be unlike the current regulatory and requirement framework trend. This would help reduce energy consumption, extend the useful life cycle of the building, and consequently, delay the building dismissal without having to face the environmental and economic costs that a new production phase would entail, when natural resources would consequently be eroded. It is therefore necessary to rethink of the building trade as of a maximally reversible production and assembly process. This is even more true where big maintenance works are performed, in replacement of scheduled and periodical maintenance operations that are difficult to perform for economic and logistic issues. We absolutely need to think in terms of components. This implies realizing, also within the building practice, that

[2] Work group for *DIPRADI (Dipartimento di Progettazione Architettonica e Disegno Industriale)* of *Politecnico di Torino*, Italy, that has developed the planning concept: L. Bistagnino, C. Campagnaro, A. Virano.

[3] Taken from architect Cristian Campagnaro's PhD Thesis, *Politecnico di Torino*, Italy.

theoretical schematisation at the basis of the categorisation provided by regulation UNI 8290-1[4] describing the build up product as an interacting complex of technical classes of elements. The project must make decomposability of the technological system feasible and allow individual components to be isolated, compared to the other ones, by leading building production practice towards endless reversible unions.

The research on façade systems has permitted us to test the degree of severity encountered as we go along, consistently with the principles of Design by Components, the management of deterioration phenomena affecting external vertical partition systems. Starting with the observation of the current status, based on the evaluation of the performance requirements the technical elements need to meet, we arrived at outlining a façade component that can be assembled in compliance with a specific technological program. The front component, as the smallest technological and semantic meaning unit, becomes the basic module we begin with, in order to "redesign" the build-up product. The project allows to check and manage the distribution of individual performances or a homogeneity of the same, in relation to the building packaging, both on its superficial extension and in its depth. The value of the component consists of its ability to combine with complementary modules, that can be assembled as well as isolated and replaced, where each item has its own performance. The project intervenes, through the construction of complex systems, at different scales. During their exchange, it is possible to realize the positive relation between what is known, the fruition moment at the component scale basically functional to the performance response, and what is new, that being the perceptive moment at a building and suburb scale, which the secondary function the component system outline, prevails on.

It is therefore possible to carry out linear, punctual and superficial interventions, in addition or supplementary to the functions destined for the buildings façades. Such interventions, if they are coherent with each other, help restore the performance efficiency and value of a built-up product, with regards to consumption users' and management waiting times. Furthermore they would give buildings more meaning within the contemporary city.

An integrated project to introduce sustainability principles into building maintenance activities of existing building stock[5]

The research is aimed at obtaining innovative building components which introduce sustainability principles into maintenance activities and facility management of real building stock. This goal is justified by the awareness that nowadays the building sector is one of the main responsible for resources consumption and impacts in the environment, especially during its usage phase.

This issue is expressed in the recent European Directive (2002/91/CE) concerning the energy performance and the application of energy certification of new and existing buildings. For this reason an extension of building life span with an high level of eco-efficiency, focusing on components maintenance and replacement activities, is an indirect strategy for improving environmental and energetic performances of buildings according to European or national directives, but also regarding zero energy and emission principles. On these assumptions, the research has been started with an analysis on background factors such as, the influence of sustainability principles both in the project of a new or rebuilt construction and in the European and domestic legislations, the adoption in the Italian context of facility management methods and systems for real building stocks, and an overview of the average age of the existing buildings and of construction market trends in Italy, which lately is more focused on renovations rather than new constructions.

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4 The norm UNI 8290-1 of September 1981 supplies, in the field of the residential building, the classification and the articulation of the technological units and the technical elements in which the technological system is decomposed. It unifies the terminology used in normative, program, planning, operative and communication activities.

5 Taken from architect Cristina Allione's PhD work, *Politecnico di Torino*, Italy

The research results that have been collected so far are, above all, the importance of the study of the weak points, made on a format basis, which can highlights the recurring problems for each selected component of buildings, the fixed requirements for each element not only according energy efficiency, but also for the inhabitants' well-being, and the most common maintenance activities for each one, with an indication of their frequency. This analysis it will be possible to define the following steps of a research aimed at designing an integrated project for these components which combine maintenance with sustainability principles.

Road Side System[6]

The "road system" is currently characterised by a complex homogeneity of parts and component, standing out from the "crowd" for the observer may have a different perception, according to whether he is moving along the road, or out of it. In the current situation, although for different reasons, the parts making up the side of the road almost always coexist independently, but are distinguishable, one from the other, as they all have separate functions, as well as being classifiable into continuous or discontinuous components, depending on how they are distributed along the road. Therefore, the focus has been shifted from the individual component to the road side system. From this point of view it is no longer important to churn out a new component (among many of them) hoping it's (finally) the problem solver.

During this analysis it was determined that we cannot shut ourselves away, inside the typological horizon of "anti-noise barriers", instead we need to hypothesise and petition for a systemic logic which, starting with the current status, looks at a wider horizon and outlines a modus operandi to overcome the current cumulative procedure consisting of: guardrail + anti-noise barriers + road signs + information + lighting, and so on.

We need to think about an integrated-integrable system which has the objective of becoming an evolutionary trend line (beginning with the constrains and the objects existing in the market) and also to a system, capable to organize components of the road-side, that is as open as possible. This is an important feature as it enables designers to enjoy great freedom, when facing problems arising from situations such as, the introduction of the object in the environment, maintaining sound device performances, using a single framework for more components and an adequate cost control.

The road side system needs to coexist harmoniously with the surrounding environment, taking into account that drivers and external observers may perceive it in different ways. It should also perform the perceptive integration of the linear road sides, to be dealt with in compliance with products generated by a unitary calling. Doing so is necessary if we wish to cater for different safety, comfort, appeal and landscape-integration related requirements.

The analysis carried out shows that we need to deal, in systemic terms, with the relationships occurring between different components (or a mix of components) that constitute infrastructures. This study points out that we cannot imagine solving problems, one by one, with individual technical solutions.

[6] Taken from architect Andrea Virano's PhD Thesis, *Politecnico di Torino*, Italy

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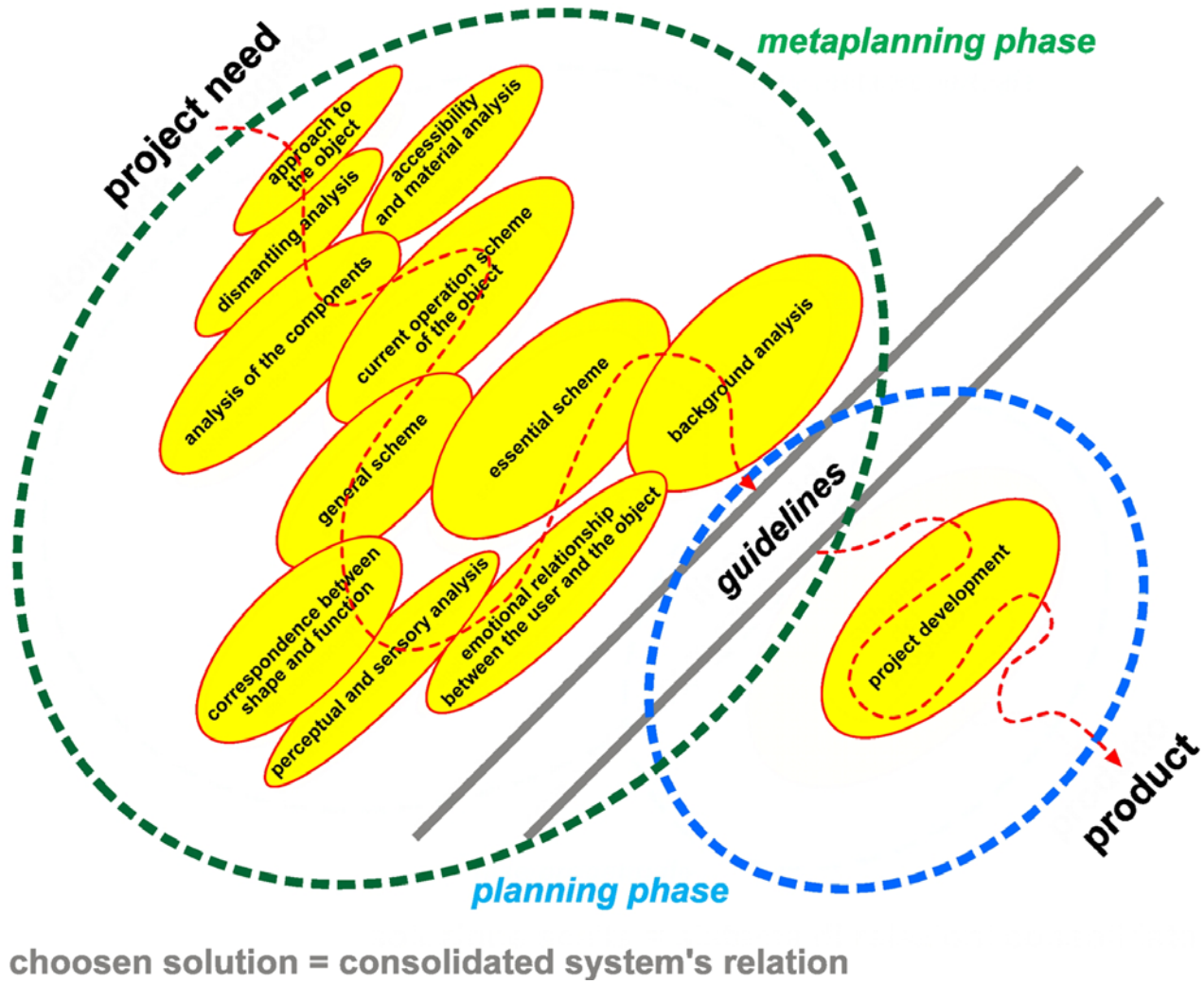

Fig. 1: Design by Components the planning path: operative/methodological tool scheme.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Vision for Mississauga's City Summit

Collaborating for Change

Julia Walden[1]

Abstract

The power of social networks has the potential to create consensus among diverse groups and can be harnessed to create transformational change. For the Missississauga City Summit, Sheridan's Visualization Design Institute modeled a design solution – a collaboration tool adapted from a social network application to engage civic and industry leaders in discussions about important issues. The summit themes: energy, economy and society are challenges shared worldwide.

The collaboration tool was a catalyst that moved summit participants to solve problems and create new visions for their city in the form of their own personalized mash-up movie. Summit participants were keen to take home their mash-ups on a memory stick to distribute their messages among friends and family. The change begins…

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1. Introduction

Sheridan's Visualization Design Institute is dedicated to innovation in visualization design. The Institute's professional team situated within Sheridan's renowned high tech, animation environment conducts applied research. This dictates a practical rather than theoretical design approach conducted one vision at a time.

The design team has considerable creative and technical capacity. In its ten year history, the team has undertaken an eclectic range of projects including: e-learning, health, bio-tech, municipal infrastructure and all genres of gaming from web 2.0 through four dimensional, real-time environments that integrate scanned objects and cultural artifacts.

This impressive record has left an important message track: no matter how talented the design team, it is critical to work collaboratively to represent what is imagined in someone else's mind. Perfect vision is difficult, if not impossible, to achieve. This difficulty is compounded when the vision like that for Changing The Change, is to influence change in multiple minds or stakeholders; however, as we have demonstrated in our project for the Mississauga City Summit, a practised multidisciplinary team can come close.

2. Background

When Summit leaders approached Sheridan's Visualization Design Institute last summer to help them realize their "the vision" for the city's future – a vision that would stimulate dramatic change in civic policy and planning, they had a few short weeks and no budget. Nevertheless, we were able to create a deceivingly simple solution – a collaboration tool that adapted, combined and "mashed-up" existing technologies with new relevant, "on-the-message" content produced by both professionals and amateurs. This achievement relied on three factors:

- the considerable creative and technical resources of an experienced design team comprised of artists and programmers with complementary skills;
- the willingness of summit leaders to experiment and take risks and;
- the enthusiasm of summit participants to play a serious game.

Summit Vision: An Urgent Proposition

Summit leaders needed a way to stimulate discussion among influential civic and industry leaders who in the course of one day were to reach consensus on issues of importance to their city and to carry that message forward to their community.

Their sense of urgency was for good reasons. Mississauga, located west of Toronto along Lake Ontario, is a suburban sprawl whose citizens' lifestyles once consisted of single family homes supported by the requisite car. But this is changing. The cost of energy is soaring. Crude oil prices are up 40 per cent already this year and even though the city is mobile and booming with 80-90 thousand commuters driving in and out every day there are concerns that any economy overly dependent on fueling the individual vehicle is unpredictable and may not be sustainable. According to the city's official web site, roads and transit are at their capacity during peak hours, creating air pollution as well as traffic congestion. These issues were reflected in the three Summit themes: energy, economy and society.

Fig. 1 Mississauga traffic at peak rush hour

Immigration and mobility patterns have seen the city become one of the most culturally diverse in the world. In March 2008, the city's Commissioner of Planning and Building reported that based on Canada's 2006 Census, "the immigrant population represents 52% of Mississauga's population… (whose) mother tongue that is not one of the two official languages;" e.g. English or French. More than half of Mississauga's immigrants are from Asia and the Middle East. The Commissioner identified the need for newcomer services and housing affordability and intensification for this diverse new population.

The Visualisation Design Institute's solution for the Misisssissuaga Summit in 2007 also works in the context of Changing The Change. In both cases, the challenge, "the vision," is to discover how design can create change towards a sustainable future. Our practical solution, due to the short time line and diversity of the audience, was to adapt a social networking application, an ideal method to facilitate the change in a mass audience. Our premise – that incenting change works better through collaboration – still holds true. We will use it as our touchstone as we move forward with an ambitious new visionary project in collaboration with Mississauga to create a Digital Corridor.

3. Rationale

Mississauga Summit leaders inspired by the Creative City Network Conference held in Toronto in the fall of 2006, recognize that in this time of massive social and environmental change it is critical to act now to sustain their city's economic advantage and citizens' wellbeing and quality of life.

Toronto is five years into a ten-year action plan to use its arts, culture, and heritage assets to position it as a global cultural capital – to incent a creative economy through the leadership of urban theorists such as Meric Gertler, Project Director of "Imagine a Toronto…Strategies for a Creative City" and Richard Florida, author, proponent of the "creative

class" and now Professor of Business and Creativity at the University of Toronto's Rotman School of Management. Both cities are located in the province of Ontario whose overall goal is to transform the economy from its reliance on light industrial and automotive industries through innovation to one based on knowledge and design through innovation. In fact, the province has a dedicated Ministry of Research and Innovation founded by the Premier. Mississauga has Hazel.

Hazel McCallion is Mississauga's 87-year-old mayor who has held office for 30 years. Early in her tenure, in 1979, Mississauga was the site of a train wreck involving explosions of dangerous chemicals, chlorine and propane necessitating at that time, the largest peace time evacuation of more than 250,000 residents. It is not surprising that Hazel's Mississauga has prioritized infrastructure and mass transit. In the mayor's own words on her web site, "I encourage you all to get out of your cars and onto Mississauga Transit."

Rather than a creative clusters model like Toronto, Mississauga's Summit leaders envision a competitive business ecosystem that is networked but extends beyond one industry or type of industry; e.g. the creative industries. The city's official web site claims home to 50 of Canada's Fortune 500 offices. Local industries and organizations represented at the summit ranged from information and communication technology to biopharmaceutical to social services such as hospitals. More than 100 industry, academic and civic leaders attended including university and company presidents, senior urban planners, municipal and federal government representatives and executive directors from arts, multicultural councils and social and health care agencies.

This sets the scene for Mississauga's Summit, establishes who was in the room and sets the challenge to create a design catalyst enabling such a diverse group to reach consensus. Here are three key considerations that influenced our choice of the mashup tool:

- the popularity and power of social networks, especially in the greater Toronto area;
- do not build what you can borrow;
- the ready availability of a web 2.0 widget.

4. Tool Selection

From the perspective of an applied research institute we had to arrive at a practical solution working from known rules:

- Rule One: Social Networks Are Popular And Powerful

The Toronto area ranks as one of Facebook's largest user groups boasting more than half a million people or ten per cent of the population, according to a report on the CTV news web site in May 2007. As practical designers, we could leverage this network both at the front end by modifying a widget or small application tool designed to enable amateurs to create content for social networks – and at the back end by using it and other web based communications to disseminate key messages virally.

Facebook arguably is part of the game paradigm and we were counting on the mashup to engage summit participants to discuss and reach consensus on issues in the same way that players of massive multiplayer online games draw on the energy of many minds to win. Psychologist Nicole Lazarro who is internationally recognized for her expertise in player experience in games, describes the collaborative capacity of social networking as a kind of "social calculus." Speaking at the 2008 Games Developer's Conference in San Francisco, she described how the "Poke," the Facebook widget that lets users get their friends' attention has been augmented to create the super successful, "SuperPoke." According to Lazarro, the model for social network design is: "One application designed by committee at any one time. If you don't get it right, millions will not come."

The Visualization Design Institute was aiming to create a SuperPoke. Among the hundreds at the Mississauga Summit, we had one chance to get it right.

- Rule Two: Don't Build What You Can Borrow

The design team proposed to adapt a beta stage web 2.0 tool developed by iBloks based in San Francisco, California. The iBloks tool demonstrated in June 2007 at the Under The Radar, Entertainment & Media Conference in Mountain View, California, was designed primarily for the advertising market as a tool to self-serve rich media. It targeted companies who want to maintain a fresh, updated online presence by providing an easy way to cut, paste and load proprietary media assets such as still images, logos, music and audio clips to create a simple, user generated "movie." The client could do this without relying on a professional ad agency or web development team. Since then, iBloks has modified their product for their target market.

Summit leaders were not easily convinced. They had envisioned a conventional movie that would inspire multiple "Aha" moments; however, the Institute's team experience is in creating three dimensional immersive environments involving interaction. Put simply, the design discussions centred on issues of:

- Technology: push versus pull;
- Originality of content: professionally produced versus hybrid professional and user generated.

Credit goes to Summit Co-ordinator Maureen Latocki who saw the potential of the proposed application and was prepared to take a risk and graciously bridged these two disparate visions.

5. Collaborative Design Theory

These discussions reflect ongoing dialogue and design questions of importance even to the applied research practice. For instance, whether in a design economy, amateur content, or hybrid amateur/professional content, is less creative than professionally produced content. Or whether technology is less valuable because by it is mashed-up or combined with other software and technology and not necessarily patentable. New creative and business models involve considerable risk. Likewise, design that opens up to user generated content is unpredictable as well as powerful.

Evidence of this is collected through several blogs maintained by Bill St. Arnaud, Senior Director Advanced Networks for CANARIE Inc., Canada's Advanced Internet Development Organization. He tracks collaboration efforts ranging from the arts to politics. For an example of a successful art collaborative, a film, his blog post on billstarnaud.blogspot, May 8, 2008 describes:

- Wreck A Movie, a new initiative by Finland based Star Wreck Studios creators of the world's first feature-length collaborative Internet film, Star Wreck: In the Pirkinning released in 2005 has more than 8 million global downloads.

According to St. Arnaud: "This niche film with Hollywood quality special effects, subtitles in 30 languages (was) all made in collaboration going against every industry standard and for only 15000 €… With today's technology, people cooperating across the Internet and now instant global distribution, the crew of 5 and 3000 of their friends across the globe proved the old model of film making and watching is not the only way. The success opens the door for any niche film to get made and then seen by millions."

St. Arnaud also is a believer in next generation democracy. In his May 1 blog post on next-generation-democracy.blogspot he predicts that "Wikis and web 2.0…have the potential to fundamentally transform the way we are governed and radically reshape political philosophy," by allowing people to track their tax dollars so that they vote on the services that are most important to them or through "personalized behaviour."

In the business context, Forrester has predicted a dramatic increase in business spending on web 2.0 applications or “Enterprise 2.0” according to analysis by Sarah Perez on the ReadWriteWeb blog, April 20, 2008.

Just as the Mississauga mash-up identified the importance and effectiveness of mash-ups among Sheridan’s student population and extrapolated it to a conference setting, Forrester predicts that Web 2.0 is ready to graduate from "Kids' Stuff.” According to the ReadWriteWeb blog post: “Right now, it's people between the ages of 12 and 17 that are the more avid consumers of social computing technology, with one-third of them acting as content creators. Meanwhile, only 7% of those 51-61 do the same. However, this is another trend that is going to change over the next few years. By 2011, Forrester believes that users of Web 2.0 tools will mirror users of the web at large.”

6. Design Process

Once the direction was green lit, artist Jonathan Eger rendered an idealized visualization, or representation, of Mississauga’s city hall as a backdrop, or digital canvas. Programmer Matthew Rogers combined the iBloks movie-making widget with several other softwares, then loaded media assets relating to the Summit themes; for example, images of traffic, local green spaces and social services such as hospitals along with music by local artist Gurpreet Chana.

A partial list of software deployed (all under academic licence):

- 3D Studio Max
- Maya Unlimited
- Adobe Creative Suite 3
- MSDN Premium
- Sony Sound Forge 9
- Visual Assist X
- Nero
- Quicktime
- WinRar
- EditPlus

A group of 24 people without specialized computer knowledge was trained to use the tool to ensure the technology would facilitate rather than impede discussion. The training took 30 minutes. After internal trials using the media assets alone, programmers retro-engineered a Microsoft word pad into the collaboration tool. They programmed the tool onto laptops that Summit participants including Mayor Hazel McCallion used in breakout sessions to visualize and brainstorm solutions.

Break out session participants use the word pad to create their collaborative narrative or mash-up story before layering in the media assets in cut and paste mode. A mouse click automatically generated a dynamic movie that each table could share with those at other tables. Participants took home their personalized “mash-up” movie on a memory stick so that their collaborative solutions could be communicated virally to those who did not attend the Summit; for example, their children so savvy in social networking.

Fig. 2: Mississauga Mash-Up Tool Created by the Visualization Design Institute Team

7. Execution

Here is a summary of observations by the design team:

- Participants were focused and engaged when their presentation/movie was being played.
- Many people, including high ranking CEOs and the mayor of Mississauga were impressed with the quickness and efficiency with which their ideas were converted into their own custom movie.
- After seeing the presentation, some participants assisted in creating the next iBloks movie when the second roundtable discussion concluded.
- Some roundtables were going above and beyond what they were trained to do; they were exploring the program and using it in ways we did not even think of.
- Participants voluntarily returned to the roundtable hall to pick up USB keys with the iBloks tool and their three presentations. They were excited to try it for themselves at home.

And here are first person observations by Summit Co-ordinator Maureen Latocki: “I spent the entire Summit day in the Idea Incubator room so was able to observe what occurred including people’s engagement during the three sessions. What I observed and what I heard from many throughout the day was the high level of energy in the room. I believe the use of the technology had a lot to do with sustained interest in the three conversations. People kept coming back to see the mash-up of their ‘big’ ideas.”

8. Results

There are several ways to measure the impact of the Visualization Design Institute's design solution for collaboration among summit participants including:

- Anecdotes: "buzz" in the room indicated engagement of participants who took their movies home via a USB memory stick to distribute to friends and family;
- Awards: Mississauga's mayor presented the Visualization Design Institute with an award for its role
- Surveys: participants ranked the break out sessions at the top of the list of Summit highlights;
- Media coverage: A *Toronto Star* article on September 26 was headlined, "Transportation stole the show," citing as proof that the city's transportation commissioner, "was shocked at how the issue took over roundtable brainstorming sessions at the Living Arts Centre in Mississauga, between panel debates and moderated discussions."

Sustaining the momentum of the summit and Sheridan's relationship with Mississauga, the Visualization Design Institute, working with representatives of Mississauga's Office of Arts and Culture and Bus Rapid Transit Offices, have developed a proposal to the Ontario government to develop the Mississauga Digital Corridor. The Digital Corridor is an exciting, ambitious project that the potential to transform the city by making a major contribution to its sustainable future. The Mississauga Digital Corridor will promote energy efficiency, clean technologies and products:

- Wireless connectivity is planned as part of the rapid transit communications infrastructure.
- This project creates the potential to extend free wireless already in Mississauga's public institutions—such as libraries – to commuting public citizens.
- The Visualization Design Institute will develop and deploy software (typically used in entertainment) to communicate relevant content in visual formats instantly understood and managed by the citizen on the move. Such content could include public data; e.g. weather information, traffic forecasts and local social/health events as well as entertainment.

Such features of the Mississauga Digital Corridor will, like the Summit mash-up, engage diverse citizens to interact with or "visualize" their journey on the new Bus Rapid Transit System. The goal is that by enriching the journey more citizens will opt for public transportation and take the mayor's advice "to get out of (their) cars."

Activities will take place first in the Institute's lab and immersion studio and then extend to the Mississauga Bus Rapid Transit creating a distinctive research test bed within the Digital Corridor. Each unique technological innovation and related visualization can be a demonstration project on the commercialization track with measurable outcomes. The ultimate goal is to advance digital media through technology and design innovations that that go beyond current point and click – cut and paste to explore various modes of interacting – step, jump, wave – move your body, use your muscles, your nerves and senses to generate joyous and precise engagement – to give meaning to the journey.

Fig. 3 Boy Interacting With Visual Display In Shanghai's Longyang Road Maglev Train Station

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

sermons in stones

argument and artefact for sustainability

Stuart Walker[1]

Abstract

This study focuses on the values, priorities and arguments needed to advance 'design for sustainability'. It critiques conventions related to innovation and technology and offers an approach that emphasises minimal intervention, integrated thinking-and-doing, and particularities of place.

These themes are discussed in relation to sustainability and clarified through the design, production and use of a simple object that is, essentially, a symbolic sustainable artefact. Although fully functional, its usefulness in contemporary society could be seen as marginal.

Its contribution as a symbol of an alternative direction prompts us to consider aspects of our humanity that are beyond instrumental approaches. It challenges initiatives that fail to question the underlying values and social drivers that affect how we act in the world.

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Introduction

> And this our life exempt from public haunt
> Finds tongues in trees, books in the running brooks,
> Sermons in stones and good in every thing.
>
> William Shakespeare
> As You Like It, Act II, Scene I

Changes in our modes of living, away from our highly consumptive lifestyles and towards ways that are both preferred and less damaging, will require not only changes in our activities but also a shift in our attitudes, values and priorities. These issues are considered in terms of the need for, and qualities of, such a shift, and what they imply for our approaches to product design and production – which is illustrated here through the design and creation of a symbolic sustainable artefact.

The discussion begins with a consideration of the dominance of technology in contemporary society, its relationship to sustainability and some of the concerns it raises; this is a question of emphasis and balance. The links between technology, consumerism and growth are discussed, along with the promises of capitalism and our notions of progress. An alternative perspective is proposed based on 'being' rather than 'having', which is rooted in long-standing philosophical and spiritual traditions. This places 'sustainability' firmly in the here and now - rather than viewing it as a goal to work towards in the distant future. The relationship between changing our activities in the world and 'inner' change in our attitudes and perspectives is related directly to sustainability and linked to the role of 'the local'. These concepts are then translated into a set of considerations for the product designer and applied through the development, design and production of an illustrative functional artefact. The result is a sustainable object, and the issues it raises offer a basis for re-thinking many of our priorities and approaches to product design. Thus, the process of creating the object and the object itself both serve to inform the discussion and throw light on the relationship between functional objects and sustainability.

Techno-Utopia

One of the most emblematic features of our current age is the prominence given to technological development. It commands enormous efforts, resources and investments in our universities, in private corporations, and in government priorities. Advanced technology fills the homes, cars and even the pockets of most people living in the affluent countries and, increasingly, in the less-economically developed countries. It is seen as a major factor in wealth creation, jobs, security, competitiveness and progress, and has become virtually synonymous with the term 'innovation'.

The development of technology is strongly linked to the potential for profit through the manufacture of consumer products – which in turn is linked to resource and energy use, waste and pollution and, all too often, social injustices. Hence, technological research and development are not neutral activities but are, in many ways, significant aspects of the 'sustainability' question; the term sustainability referring to the now familiar three-pronged relationship between social, environmental and economic issues.

Advanced technologies have brought enormous benefits to many areas of our lives – from medical research to communications, and some new technologies help

reduce environmental impacts by offering more energy efficient solutions and less polluting products. However, it must also be acknowledged that the emphasis given to the development of consumer goods based on advanced technologies, and their consequent production and global distribution, is creating very severe environmental problems together with many social injustices and inequities (e.g. Waste Online, 2008; Cafod, 2008). Therefore, if we are to seriously address the challenge of sustainability, it will be important to consider the emphasis placed today on the development and proliferation of such consumer goods; goods that quickly become discarded and replaced because of the speed of technological advance.

Furthermore, technological research and development tend to be well supported by government (i.e. taxpayers') funds through research councils and regional development agencies (Guardian, 2007). When preferential support is given to science and technology over, say, the arts and humanities (in the UK by a factor of over twenty to one[1]), based on a rationale of creating competitive advantage, growth, jobs and wealth then, despite the benefits, there arises an imbalance in our priorities and our efforts – one in which instrumental value is favoured over intrinsic value.

Unsustainable Development

The relationships that exist between technological development, short-term government agendas (i.e. jobs equal votes), and the production of short-lived, hi-tech consumer goods, all serve to encourage consumerism and reinforce a fundamentally unsustainable system. It is irrational to think that we can reduce our environmental impacts and advance social and economic wellbeing, equity and justice (i.e. conform to the principles of sustainability) through unbridled development of more and more increasingly sophisticated technologies. Within a free market, capitalist system, investment in R&D is only justified if it is likely to turn a profit in the future. This invariably means the commercialization of the technology through saleable products, often in the form of mass-produced consumer goods, which, in turn, intensifies environmental damage and is frequently associated with social exploitation. This route to economic prosperity and societal wellbeing is based on:

- the fallacious, increasingly precarious and damaging ideology of *continuous growth* - in production and consumption - and hence, too, in resource and habitat depletion, pollution, waste and human exploitation (see Korten, 2001, 43-56)),

- the misguided attempt to attain happiness through ever higher material standards of living, and

- aggressive competitiveness within a global economy.

To continue to pursue such methods only maintains the same kind of thinking that has characterised the past century or more. This is not innovative thinking, it is just the same thinking applied to the continuous development and production of ever new, often trivial, consumer goods. At one time it may have been justified to produce any and every kind of product we could imagine as long as it created wealth and jobs. Today, however, the cumulative impacts and harmful effects are only too evident, making the continuation of such practices increasingly difficult to justify. However, the messages of marketing persistently tell us that we need, indeed deserve, these technological 'marvels', and the shrewd talent of the advertising industry is to even turn critique of consumerism into persuasive advertising copy. A recent collaboration between the U.K. department store Selfridges and American artist Barbara Kruger is

one example (Douglas, 2006), where in-store banners boldly proclaim, “Buy me, I’ll change your life” and “You want it, You buy it, You forget it” (Fig. 1). Similarly, the U.S. auto manufacturer Hummer, which has received criticism for its oversized vehicles aimed at the consumer market, launched a TV commercial that focused on a man buying vegetarian produce who is later seen at the wheel of a Hummer, accompanied by the line “Restore the Balance” (Hummer, 2006). By employing irony and humour, such examples demonstrate the infinite adaptability of capitalism, which allows it to undermine virtually any form of critique (Miller, 2005, 2).

Of course, a major objective of commercial corporations is to create and continually grow shareholder profit**,** and technology linked to consumerism has become a primary means for creating such profit. Governments usually support this, seeing it as positive for the economy. However, despite the plethora of ‘green’ rhetoric that emerges from corporations and governments alike, approaches based on continual growth in consumerism, resource use and energy use are clearly at odds with any serious understanding of the term ‘sustainability’.

Flawed Perfection

When manufacturing is combined with marketing the result is often a technocratic version of societal wellbeing. The implicit message is that some kind of future Utopia of sustainable perfection is actually attainable, where our environmental and social problems will be solved through the ingenious application of advanced, super-efficient, non-polluting technologies. Such a notion is clearly idealistic, patently false and flies in the face of both logic and the teachings of all the major philosophical and wisdom traditions down the ages. Yet, the unerring message of corporate commercialism is, in effect, that this product or that service will fulfil your dreams and make you happier.

These flawed notions are being taken ever further as corporate interests remorselessly create dissatisfaction and stimulate desire – from the gaudy trappings and superficial ‘splendours’ of the modern shopping mall (Figs. 2-4) to the increasingly exclusive and outlandish goods and services on offer. Both are meant to appeal to our vanities through their suggestions of elitism and status. At a recent conference of the Industrial Designers Society of America (IDSA, 2007) keynote presentations included a high performance electric sports car (Straubel and Hatt, 2007**;** Tesla, 2008) and the planned commercialisation of space tourism (Seymour, 2007**;** Virgin Galactic, 2007). While a high priced electric sports car may appear to address concerns about auto emissions, the problem is simply transferred from the exhaust pipe to the electricity generating station, which could be coal fired – creating carbon emissions; nuclear – creating a radioactive waste problem; or hydro – creating an environmental impact problem. Such exclusive products do little to seriously address environmental concerns but they do serve to stoke our desires and maintain our addiction-like behaviour towards consumption (de Graaf *et al*, 2001; Badke and Walker, 2008). They also bring with them their own problems. In this case, for example, no mention was made of the relatively short life or the disposal problems associated with thousands of batteries. The space tourism presentation concentrated on the ‘experience’ being offered – the excitement of acceleration, three or four minutes of weightlessness, the views of the earth and the stories to tell your grandchildren.

Such thrill rides, whether in a sports car or a space craft, have little to do with fostering meaningful notions of contentment; instead they offer a false notion of happiness based on consumption. While such aspirational products, available only to

the few, may cultivate vanity, envy and discontent, the proliferation of less expensive products creates even broader problems. For example, the recent launch of the world's cheapest car, by Indian automaker Tata, (2008) will help further transform India into a high consumption society.

These kinds of products and services exacerbate already severe environmental problems – directly through their contribution to cumulative effects and indirectly through the dissatisfaction and cravings they foster.

Philosopher Charles Taylor explains that a particular characteristic of the modern, secularised worldview is that 'meaning' is sought through self-realization, which is based in concepts of progress, reason, freedom etc. He says that unlike in previous times, where meaning was found in higher or transcendent understandings, in the modern world a sense of meaning in one's life is based in the idea that individual efforts can contribute to human progress across time. Thus, human efforts related to advancement and material progress have become central to contemporary notions of 'meaning'. Criticism of this relatively recent idea is rooted in the fear that it yields only meaninglessness, either through an unexceptional sameness, a 'levelling down' of humanity or that the denial of the transcendent results in vacuousness – the threat of an empty life, inspiring "nothing but ennui, a cosmic yawn" (Taylor, 2007, 716-717).

Between the idea
And the reality
Between the motion
And the act
Falls the Shadow

T. S. Eliot,
The Hollow Men, (1925, 91-92)

Progress, Meaning and Unsustainability

This highlights some of the most fundamental problems associated with our contemporary efforts to address sustainability. Modernity, with its ideology of progress, sought to advance human happiness, meaning and fulfilment through industrialization and the consumption of material goods. Its rationalizations led to a severe attrition in traditional sources of meaning in most of the economically developed countries of the 'west' and, as Northcott has pointed out, the imposition of this ideology on developing nations, through institutions such as the World Bank, has led to environmental and social destruction on a massive scale (2007, 175-177). Joseph Ratzinger, Pope Benedict XVI, has expressed a similar view, "The aid offered by the West to developing countries has been purely technically and materially based … It has thrust aside indigenous, religious, ethical, and social structures and filled the resulting vacuum with its technocratic mindset" (2007, 33). Moreover, it is important to recognise that there is no evidence to support the implicit assumption of modernism that technological and material advancement is accompanied by moral progress – the industrialized genocide of WWII and the consequent advance of technology for arms development belie any such claims (Armstrong, 2006, xi).

Challenges to the assumptions of the modern view gave rise to postmodernism. On the one hand, this holds the promise of a renewed sense of meaning, through its apparent tolerance of diverse forms of expression, including religious expression and the acknowledgement of meaning via the transcendent. On the other hand, it couches religion, along with other forms of expression, in relativism,

thereby denying any claims to universal truth or authority (Beattie, 2007, 132-136) and rendering them banal and ineffectual; a factor that is not unrelated to the rise of fundamentalist reaction, both religious and secular (*Ibid*, 139).

The undermining of modern assumptions about progress and the relativism of post modernity has contributed to the emergence of what Beattie calls the "voracious consumer" who constantly seeks "novelty, innovation and change" (*Ibid*, 133), but who, in lacking a sense of overall meaning and purpose, is highly vulnerable to the persuasive messages of corporate marketing where meaning is always to be found in the *next* purchase.

Having or Being

Neither modern notions of progress in general, nor technological progress in particular, can claim to have brought us closer to more sustainable ways of living; in fact, the evidence points in the opposite direction. Similarly, the multifarious and confused concerns of postmodernism mean that calls for more sustainable directions, for limiting the emissions associated with climate change, and for improvements in social equity and justice, emerge from the very same government and business leaders who simultaneously espouse the mantra of growth and free trade and who, to achieve these goals, effectively promote "voracious consumption". There are inherent contradictions in such messages, and in the perplexities created we simply continue our frenzied stripping of the planet. In the affluent countries especially, human wellbeing has become synonymous with the accumulation of products, and as people increasingly associate their sense of identity with what they own, rather than who they are, "*having* takes precedence over *being"* (Northcott, 2007, 186). When this is accompanied by a sharp rise in 'entertainment' products, as has been the case in recent times, then acquisition is combined with ever greater opportunities for distraction and atomization – further eroding a reflective sense of self within a larger, meaningful social context .

An emphasis on *having* rather than *being* and the dangers it holds for our welfare is echoed by theologians such as Williams who says, "There is something about Western modernity which really does eat away at the soul" (BBC News, 2007). Similarly, the philosopher De Botton has said, "Our minds are susceptible to the influence of external voices telling us what we require to be satisfied, voices that may drown out the faint sounds emitted by our souls and can distract us from the careful, arduous task of correctly tracing our priorities" (2004, 201). Hence, the cult of 'progress' and opportunities for distraction from reflection, self-knowing and the search for meaning have become key features of our contemporary age. Both are linked to acquisitive lifestyles and, thus, to un-sustainability.

Universities are not immune to the rhetoric of the times, indeed, as governments impose increasingly prescriptive measures on university research budgets, they have little choice but to toe the line if they are to secure research funding. Two recent university marketing strategies proclaim, *"It's not where you are, it's where you're going"* and *"It's not where you are, it's where you want to be"*[2]. Such slogans parallel commercial agendas that foster dissatisfaction with the 'now' by emphasising the potential and allure of what's coming 'next'. These are unfortunate messages to be sending out to young people about to embark on their university careers – education is promoted as a means to some other end, rather than having merit as an end in and of itself. It is marketed solely as a ticket to a good job rather than for a love of learning. Such messages implicitly denigrate the value of the present, of living fully in the here and now. They also demonstrate how insidious the

ideologies of our age have become – because if there is one institution in our society that should be examining, challenging and critiquing such assertions it is our universities. As Chesterton once put it, “It is always easy to let the age have its head; the difficult thing is to keep one’s own” (1908, 103)

Another Voice

Those who tell of a different way tend not to be politicians, business leaders, economists, or technologists, but poets, artists, philosophers, and those dedicated to more spiritual pursuits. This alternative path is represented in the Long Now project of artist and musician Brian Eno *et al* (Eno 2001; Long Now 2008); in the traditional religious understandings of the ‘eternal now’ spoken of by the Benedictine monk David Steindl-Rast (Steindl-Rast and Lebell, 1998, 7); it is alluded to in paintings such as *L’esperança del condemnat a mort 1-111* by Joan Miró (1974); and in the words of Longfellow when he writes:

> Trust no future, howe’er pleasant!
> Let the dead past bury its dead!
> Act – act in the living present!
>
> H. W. Longfellow,
> A Psalm of Life, (1981, 189)

Emphasis is placed on living fully in the reality of the *present*, rather than constantly anticipating or yearning for the *next* thing.

This suggests a rather different way of understanding sustainability - not as some future way of living we must strive towards, but as something to address now - in our attitudes, thoughts and actions as individuals; in our *being* rather than our *having*. It challenges our assumptions, our desires and our behaviours. Living fully in the ‘eternal’ present is not about momentary thrill rides or continual consumption. As such, it represents a significant change in priorities and values. Undoubtedly, without such an ‘internal’ change we will be unprepared and unwillingly to make the necessary systemic changes that are required; changes that could steer us away from our current highly consumptive and destructive behaviours. Indeed, if our contemporary modes of living are environmentally unsustainable, then sooner or later we will have no choice but to change. However, without a shift in priorities and values such enforced change will be viewed as a continuous imposition of undesirable deprivations that inexorably impede our progress towards our still-desired but increasingly elusive lifestyles.

Sustainability: Values and Localization

Sustainability does not simply represent a problem ‘out there’ to be fixed – through new technologies or legislation or policy. Without a clear sense of inner purpose and meaning such ‘external’ activities can, and do, create a host of contradictions. External change has to be accompanied and steered by inner change. As Armstrong has said, “Unless there is some kind of spiritual revolution that can keep abreast of our technological genius, it is unlikely that we will save our planet. A purely rational education will not suffice” (Armstrong, 2006, xi).

Realistically, we cannot hope to reduce environmental degradation if we are not also prepared to reduce our levels of consumption. This is only likely to occur if we can develop other ways of finding fulfilment that also provide for economic confidence and security. For such change to occur, we need to consider what it

means to prioritise *being* over *having*, and the effect this might have on our ways of living.

Such notions are anything but new. Emphasis on living fully in the present, or "being", has always been a principal teaching of the world's major philosophical and spiritual traditions. These traditions - from Lao Tsu to Thoreau and from Socrates to Gandhi – not only speak of inner development through selflessness and rejecting ego-centric desires, they also teach that concern for wealth, status and possessions hinders 'inner' growth (e.g. *Phaedo* by Plato, Tredennick and Tarrant., trans., 1954, 125). They are therefore completely consistent with contemporary sustainability concerns related to the damaging effects of consumerism. These teachings, however, could not be in starker contrast to today's corporate messages, see Table1.

Despite their wisdom and their relationship to inner development, the 'narrow path' of which these teachings speak (e.g. Mascaró, 1965, 61) has always been sidelined in the everyday busyness and business of society; striving for worldly comforts, distractions and personal gain too often take precedence. In the past, the effects of such behaviours on the planet itself were relatively minor, even though they may have been socially or personally harmful. However, this is no longer the case. The drastic rise in urban populations over the last century, accompanied by massive growth in industrialization, mass marketing and mass consumerism, have contributed to environmental impacts that in recent times have become alarming in their implications[13].

"…because the financier's sun
is not Blake's sun, there is a
word missing from the dawn chorus.

R. S. Thomas,
Mass for Hard Times, (2003, 233)

Thus, the teachings of the traditional wisdoms represent many essential considerations for sustainability: focussing on the present, rather than being preoccupied with the future and the 'next thing'; reducing acquisitiveness and consumerism, rather than constantly desiring more; being concerned for the welfare of others, rather than the self-oriented focus that is encouraged by corporate marketing. Furthermore, giving greater importance to *localization*, which is also a significant element of sustainability, ties-in well with these traditions.

Firstly, 'the local' addresses that which is proximate. Consequently, people become more directly aware of the impacts of their activities on their environment, and there are obviously individual and communal benefits in looking after one's own local environment – to ensure an attractive and healthy place to live and work.

Secondly, through direct encounter at the local level we are less inclined to objectify other people. When we fail to see and treat other people fully as people, but think of them as 'consumers' or 'labour', then we help create 'the other'. When this happens it represents a failure to empathize. Globalization would seem to exacerbate this tendency because of physical distance or differences in language, class, ethnicity, religion or skin colour. We may hear about exploitative labour practices 'over there', in countries such as China or India that manufacture goods for the affluent western nations, but the physical separation also distances us mentally and can lead to objectification and the acceptance of practices and conditions that are inequitable, unjust and that we would not be prepared to tolerate ourselves. While certainly not impossible, it is more difficult to objectify people with whom we have direct contact - our neighbours and colleagues, and the people we encounter in our

everyday lives. Therefore, in addition to efforts that seek to reduce human exploitation in developing countries, a shift towards greater localization in manufacturing would encourage direct encounters and therefore practices that conform to the sustainable principles of social equity and justice.

Thirdly, focussing on local practices, activities and solutions can rein in our tendency to consider sustainability as something to be worked towards - as something to be achieved *in the future,* where there will no longer be inequity and injustice or environmental degradation; this is Utopian and counterproductive. We are obliged to act in the present, to challenge our destructive norms and to develop practices that lead away from environmentally and socially damaging conventions. Irrespective of some future condition, each one of us, in our activities in the present, should be contributing constructively within our own sphere of impact – and with the understanding that the notion of 'the local' may vary considerably from one individual to another, depending on one's role and contribution.

A shift towards greater localization would, for the reasons outlined above, mean that the price of consumer goods would better reflect their true costs. The people making the goods would be receiving a living wage and working in decent conditions, and it would be in everyone's interest to ensure that environmental standards were upheld. Thus, it seems that a shift towards localization would encourage those attitudes and behaviours spoken of in the world's great wisdom and spiritual traditions and, in the process, would better address many social and environmental principles,

Artefact: a symbolic sustainable object

The potential difference these concepts might make in the field of product design becomes clearer if they are made more directly relevant to the design process. Therefore, this present study includes the creation of a functional object. The design and production processes and the artefact itself serve to embody and exemplify the principles being explored; the aim being to effectively encapsulate the *general* concepts and ideas discussed above within the design and creation of a *specific*, tangible object.

The practice of design is itself a form of inquiry that connects 'thinking' and 'doing' within an iterative, mutually informing process. Therefore, the creation of a physical artefact, which emerges from and contributes to the ideas, can bring an important design-centred element to our understanding of the issues.

A number of design objectives can be identified from the foregoing discussion,

- The functional benefit of the object should be consistent with or contribute towards the shift in values that have been described, including a shift from *having* to *being* and an emphasis on the present. It should contribute positively towards a reorientation in priorities – away from those that maintain a socially harmful and environmentally damaging production system, that tend to concentrate economic gains, and which encourage dissatisfaction, consumption and waste, and towards those that are in accord with the ethical and sustainable principles of socio-economic equity and justice and environmental responsibility.

- The object should be capable of being produced wholly or partly at the local level by making use of the materials and skills readily available within a place, and with a minimum use of energy resources.

- The environmental impact of the object during its creation, use and post-use should be negligible. Its concept as a thing, its materiality, its process of production, its function, its use and its disposal should all be entirely consistent with the ethos of sustainability.

Thus, the goal is not simply to achieve an object that *aims towards* sustainability by reducing its impacts compared with other similar objects but which, itself, still has a negative effect. Instead, the goal is to produce something that actually is *a sustainable object* in its very conception as a thing. This means it must be sustainable not only in its mode of creation, its function, its aesthetic and in its eventual disposal, but also in the way that its presence and use contribute to positively developing and reinforcing an attitude of sustainability.

Several other factors were considered in the development of this illustrative object:

- The place that was to yield the object had to be proximate to where I, as the designer, was living and working – i.e. it had to be local to the designer.

- The determination of what the functional object was to be, and its specific definition, would be a result of combining a familiarity and consideration of place with the factors related to purpose, materials and skills discussed above.

- An emphasis on the fitness or aptness of the object to 'purpose-and-place' overrode other factors that might be important in a contemporary design practice. Commercial viability was not a factor; the purpose of the project being to further academic inquiry and to be illustrative.

- Novelty and originality were not considered to be important and were not sought after when deciding on the type of object to be created or when designing its form. Unusual as this may seem, modern consumerism is so strongly associated with and promoted by novelty and so called innovation, that an attempt was made to eliminate such factors from this design project. There are precedents for such an approach. For example, in the creation of the icons of Eastern Orthodoxy the subject of the icon is painted (or 'written', as is conventionally said) by reference to previous depictions, and composition and style are determined by tradition rather than through individual expression (Proud, 2000, 8; Ware, 1987, 38-39).

Bearing in mind these priorities and considerations, the rural area immediately adjacent to my place of work was visited (Fig. 5). It is a place of high moors and deep fertile valleys. The main occupation is farming, and the predominant sight is dry stone walls enclosing pastures filled with different varieties of sheep. Streams and rivers cut through the moor land, with gravel beds and ancient stepping stones, and stone farmhouses and barns stand out on the horizon (Figs.6-9). Research about the area revealed a small cottage industry of rare-breed sheep rearing, together with the spinning and weaving of their wool.

Reflecting on these experiences and findings, and referring to a previous study that looked at objects used as aids for inner development and contemplation, (such as the Buddhist prayer wheel, prayer beads and the Jewish prayer shawl)

(Walker, 2006, 39-51) I was reminded of references to an ancient type of tallying device used for keeping track of meditative sayings or prayers (Schaff, 1886, 367; Schaff, 1889, Ch.32; St Paul, 2000, 24). The 'device', used since the 3rd century, consists of a simple pile of stones. To keep track of the spiritual exercises, each time a saying or mantra is completed, a stone is moved from the pile, to form another adjacent pile. Combining such a device with the local cottage industry of weaving would enable a simple, illustrative, functional object to be produced that would fulfil all the priorities set out for the project.

Revisiting the area, small stones were collected from a stream bed. These were later cleaned and dried and piled in a manner suitable for use as a tallying device. Moving the stones one by one into a second pile prescribed a comfortable 'use' area, which was then defined in terms of specific dimensions. The local weaver was visited and a piece of woven cloth was commissioned, which was to be made from the wool she had spun from the rare breed Teeswater sheep that she rears (Figs. 10, 11). Several weeks later, the cloth, woven on a small hand loom, was ready (Fig. 12). The stones were then placed on the cloth to form the simple 'tallying device', and the artefact was complete (Figs. 13-15).

A Symbolic Artefact

Clearly this object is very simple and its significance as a useful tool for a contemporary audience is marginal to say the least. However, as an artefact it fulfils all the objectives described earlier.

In terms of its function, these types of devices are used in conjunction with meditative practice – which in turn is related to a shift in priorities. Such practices have been carried out in many cultures all over the world for thousands of years. They can be based in religious tradition or they can be entirely secular. Frequently they centre on the repetition of a passage of scripture, a short phrase or even series of meaningless syllables (LeShan, 1974, 67). These practices can lead to greater attentiveness, and freedom from compulsions and cravings (Easwaran, 1978, 11) that are the kinds of behaviours associated with consumerism. Therefore, this type of object is related to the shift in priorities that seem to be needed to counter our susceptibilities to the messages of modern marketing, impulse buying etc. Hence, the conceptual nature of the artefact is consistent with sustainable principles.

In terms of its definition as a thing, its materials, and the manner by which it was produced – these are all intimately related and responsive to locale and the particulars of place. While its actual usefulness may be marginal, its relevance lies more in what it represents, in terms of its concept, its process of creation, and its materiality. It signifies a sort of sustainable ideal because, by conceiving it as an object that is related to a shift in priorities and by intentionally keeping it very simple and local:

- its use is associated with the development of values that are in accord with sustainability,
- it offers an opportunity to employ local people and locally available skills and resources,
- it takes little to create in terms of materials and energy,
- its use produces no adverse waste, and

— at the end of its useful life it can be easily re-absorbed back into the natural environment with no detrimental long-term effects.

In this sense it is symbolic. Even though this degree of sustainability may be unattainable in the creation of most other objects, it provides an example of what a fully sustainable functional object can be.

In addition, the creation of this object demonstrates the ability of the design process itself to contribute to knowledge. It exemplifies well how the experiential process of ‘designing’ can inform our understanding of the relationship between the conceptual notion of an object, its design and production, the nature of the resulting artefact and the priorities of sustainability. In this case, the consideration of aptness to place comes to the fore, which expands and deepens our understanding of 'the local' in the context of manufactured functional objects. It is not simply a case of doing things locally for instrumental benefits - to create local jobs, reduce transportation etc. The difference is also qualitative, aesthetic and cultural. The functional object is no longer an alien artefact that is imposed upon a place. Instead, it is an artefact *of* place, which emerges from a gentle rearrangement of the elements within the local environment – like the art works of Andy Goldsworthy or Richard Long, or the vernacular architecture of traditional cultures such as the adobe houses of the American Southwest, the reed houses of the Marsh Arabs, or the stone cottages of rural England. These vernacular forms, like this ‘tallying’ object, are not concerned with novelty, individual expression or ‘making a splash’. They are quiet, familiar forms based on traditions that are centuries old and processes that have been contributed to by many over time. The resulting artefacts are both refined and apposite and, in many important aspects, they ‘work’ effectively within their social and natural environments.

Thus, ‘the local’ is a critical element of design for sustainability and the nature of sustainable objects. It contributes to important extrinsic factors, such as reducing environmental impacts, and providing work and economic benefit through local employment. However, it also contributes to the intrinsic qualitative and aesthetic aspects of objects, and to the qualitative and aesthetic aspects of the culture in which the objects are produced. These intrinsic factors, so easily forgotten when discussions focus on environmental performance indicators and targets, are vitally important if we are to shift our values and priorities and develop a new kind cultural relationship with and attitude to material ‘goods’.

Table 1: Traditional Teachings and Marketing Messages

Teachings of Philosophers and Spiritual Leaders down the Centuries	Corporate Messages in the 21st Century
"There is no greater sin than desire, No greater curse than discontent" Lao Tsu, ca.500 BC, China[3]	"[The photos] never show the entire car but still arouse desire for something new." Mercedes-Benz, 21st century, Europe[8]
"…those who buy something [should live] as if it were not theirs to keep; those who use things of this world, as if not engrossed in them." St Paul, 1st century, Europe[4]	"Its yellow, white and Everose gold are timeless symbols of prestige and luxury" Rolex Ad, 21st century, Europe[9]
"Our inventions are wont to be pretty toys, which distract us from serious things." Thoreau, 19th century, USA[5]	"With an anodised alumnium and polished stainless steel enclosure and a choice of six colours, iPod nano is dressed to impress." Apple, 21st century, USA[10]
"…present -day industrial society everywhere shows this evil characteristic of incessantly stimulating greed, envy, and avarice." Schumacher, 20th century England[6]	Google's profits were up 17% to $1.21bn (£608m) for the three months to the end of December. Some analysts had been hoping for stronger profit growth and its shares fell sharply in after hours trading. BBC News, Feb. 1st 2008[11]
"Civilization, in the real sense of the term, consists not in the multiplication, but in the deliberate and voluntary reduction of wants." Gandhi, 20th century, India[7]	"Glacéau smartwater the water with all the answers." Bottled Water Ad, 21st century, USA[12]

End Notes

1. For example, in the UK research in the arts and humanities has an annual research council budget of ca. £75M compared to £1556M for research in engineering, science and technology, not including medical science (£500M for the Engineering and Physical Sciences Research Council, £336M for the Biotechnology and Biological Sciences Research Council, £220M for the Natural Environment Research Council, and £500M for the Science and Technology Facilities Council) (RCUK, 2008).

2. University of Cumbria (2007) *"It's not where you are, it's where you're going"* banner displayed on the Lancaster campus of University of Cumbria, September 2007. University of Liverpool (2007) *"It's not where you are, it's where you want to be"*, advertisement in the FT Magazine of the London Financial Times, October 13/14. 2007, p.43.

3. Feng, G. F and English, J. (trans.) (1989) Tao Te Ching, by Lao Tsu, Vintage Books, Random House, New York, Chapter 46, p.48

4. 1 Corinthians, 7:30-31, The Holy Bible, New International Version, New Testament, Zondervan Publ. House, Grand Rapids Michigan, 1973, p.226

5. Thoreau, H. D. (1854) *Walden*, in Walden and Civil Disobedience, Penguin Books, New York, 1983, p.95

6. Schumacher, E. F. (1979) *Good Work*, Abacus, London, p.27

7. Iyer, R. (1993) *The Essential Writing of Gandhi,* Oxford University Press, Delhi, p.378

8. Mercedes Benz TV, Weekly Show 29.02.08, promotional film for the CLC car "Key Visual Shooting part 2", at:
http://www.mercedes-benz.tv/index.html?csref=mbcom_ws_mbtv0107_uk_en
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9. Rolex Watches Website, information about the GMT-Master II watch, at:
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10. Apple Store Website, information about the iPod nano, at:
http://store.apple.com/1-800-MY-APPLE/WebObjects/AppleStore.woa/wa/RSLID?nnmm=browse&mco=3587D037&node=home/shop_ipod/family/ipod_nano; accessed January 31, 2008

11. *Google profits Disappoint Market,* BBC News Online, February 1st 2008 at:
http://news.bbc.co.uk/1/hi/business/7221170.stm, accessed February 1st 2008.

12. Print advertisement for Glacéau smartwater in Vanity Fair Magazine, New York, July 2007, p.85

13. For example, the Intergovernmental Panel on Climate Change, which shared the 2007 Nobel Peace Prize with Al Gore, says that in a little over a decade up to 250 million people living in Africa will "be exposed to increased water stress", and "Agricultural production, including access to food, in many African countries is projected to be severely compromised," with crop yields in some countries down by 50%, (*Intergovernmental Panel on Climate Change Fourth Annual Report – Climate Change 2007: Synthesis Report*, *AR4*, Table SPM.2 Examples of some projected regional impacts, p.10. Available at: http://www.ipcc.ch/, accessed February 1, 2008.

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Figures: Photo Series
ARTEFACT, PLACE and SUSTAINABILITY

Fig. 1 Marketing banner "Buy Me", Selfridges department store, Trafford Centre, Manchester, January 12th, 2008

Fig. 2 Main concourse 'Palm Court', Trafford Centre, Manchester

Fig. 3 Food court ‘Ocean Liner’, Trafford Centre, Manchester

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Fig. 5 Countryside adjacent to author’s place of work

Fig. 6 Dry stone walls

Fig. 7 Sheep pasture

Fig. 8 River stones

Fig. 9 Stone Barn

Fig 10. Wool from Teeswater sheep

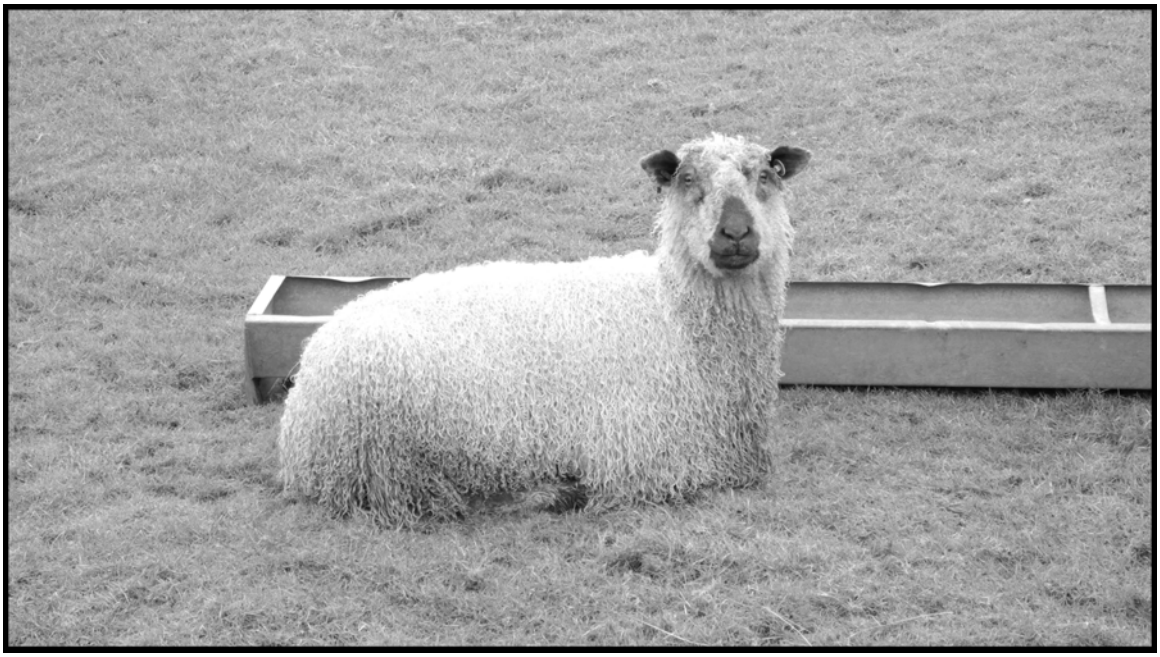

Fig. 11 Teeswater rare breed sheep

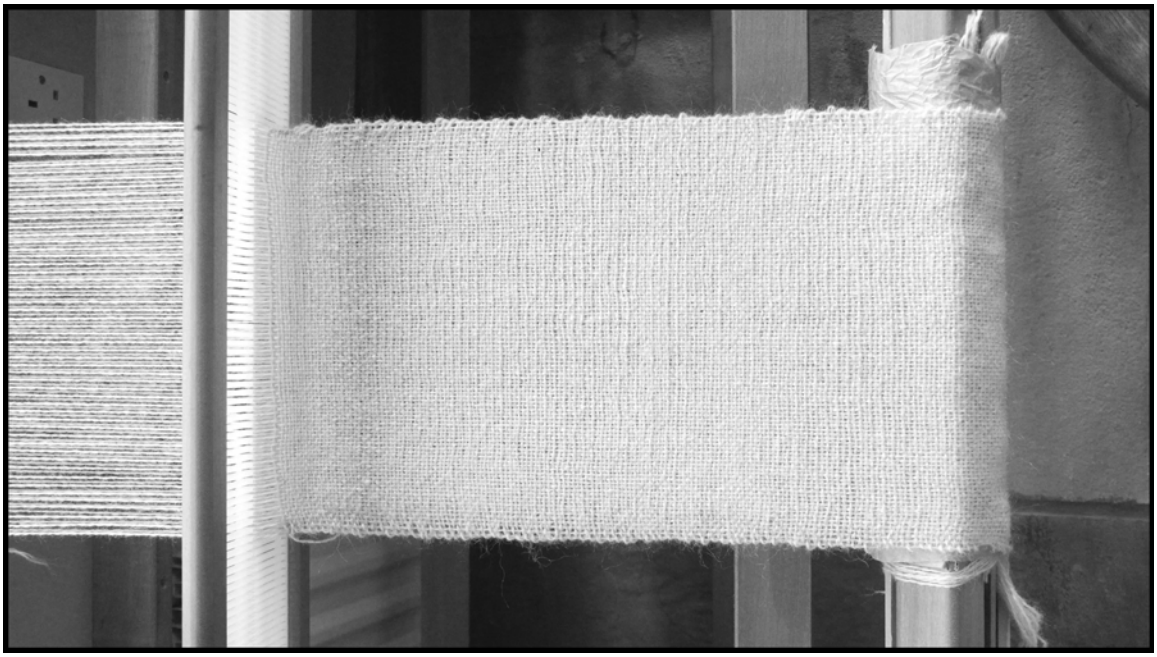

Fig. 12 Woven cloth on hand loom

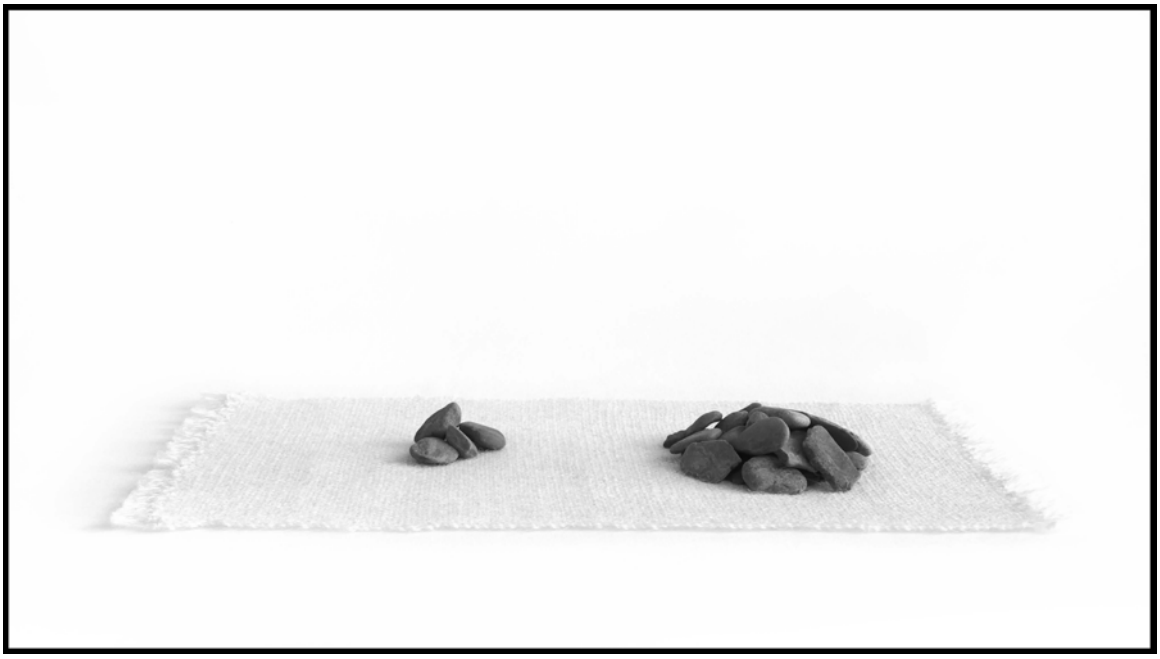

Fig. 13 Sustainable artefact: a ‘tallying device’ – 33 river stones on a woven cloth

Fig. 14 Sustainable artefact, detail 1

Fig. 15 Sustainable artefact, detail 2

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Changing the Change:

A Fractal Framework for Metadesign

John Wood[1]

Abstract

If designers wish to build an ecological society they will need to participate in a profound political and economic change. Where current democracies are largely 'top-down', manipulative, and choice-based, ecological governance will also need to be 'bottom-up', holistic, imaginative, and co-creative. This paper suggests that we might go some way to achieving this by developing a new profession that it calls 'metadesign'. This is a comprehensive co-design methodology in which the metadesign team also co-designs its frame of reference. The paper's conclusions are informed by some empirical work conducted within AHRC-funded research at Goldsmiths, University of London – 'Benchmarking Synergy Levels within Metadesign' (a Designing for the 21st century Project) that produced more than 80 metadesign tools.

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Introduction

Inspired by the analytical logic of Aristotle, and by the mechanistic reasoning of Galileo, Newton and Descartes, some physicists (e.g. Laplace, 1819 - c.f. Rubino, 2002) believed the world to be totally predictable. And even though this was a dissipative model, it inspired the idea of a 'technologically sustainable' world – i.e. one in which the change need never change. The theory was soon discredited but it still lives on in the modern imagination. If technology can enable us to travel to the stars, we tell ourselves, we may become immortal. Perhaps this is why we have yet to embrace a smarter, more ecological mode of reasoning (Wood, 2008). Mechanistic metaphors, such as 'economies of scale', and 'law of diminishing returns' inform an industrial vision that, like the Aristotlean idea of design, is fundamentally teleological. This is not how Nature seems to work, yet he underlying vision of a prosperous future without end is inseparable from popular terms such as 'sustainable development' (e.g. Brundtland, 1987) and 'sustainable consumption' (e.g. UN, 2007). To be fair, eco-design has sought to resist the mechanistic mindset by reflecting upon lifestyle, as well as products, services and manufacture. However, the paper argues that these approaches are unlikely to work unless they are integrated within a far more holistic and situated (i.e. less Newtonian) politics of understanding. But how can designers join things together again if they continue to be educated, and employed, as profit-enhancing specialists, rather than ecologically and socially-minded generalists?

1. The Big Context of Design

As we all know, in order for our civilisation to survive, designers need to make the world 'greener'. But this also raises complex political issues, as it would include bringing a better quality of life to the world's poorest peoples. Trying to 'make poverty history' could also bring disasterous environmental consequences. At present, twenty cities now have a population of more than 10 million and more than half the people on the planet live in cities. High levels of congestion and urban poverty (around 50%) go hand-in-hand. Intensive urban farming creates health problems, largely because of food contamination and overcrowding. In poor urban communities, although inhabitants consume fewer calories, they spend 30 percent more of their incomes on food than those who live in rural areas. This is not just because of low incomes and the high cost of fuel. In many high-density cities, between 10 and 30 percent of food produce is lost or spoiled because it must be transported over long distances. The obvious way to address this issue is to grow more food in the cities themselves (Wood, 2007:1). This happens already to quite a large extent. At present 200 million urban farmers supply food to about 700 million city dwellers, i.e. one-quarter of the world's urban population. In order to re-design this dysfunctional situation we need a de-centralised system of consensual governance. Designers also need to co-create a discourse that enables everyone to understand things in a more holistic and relational way (Wood, 2007:2). If this does not happen, society's frustration will seriously threaten political stability and world peace. Unless these challenges are met by the relevant agencies, even the wealthy will pay more, albeit indirectly, for problems such as illegal immigration, narcotics, crime, wars and plagues. What has been design's contribution to these challenges, and how can we help, in the future?

2. Why Design Needs to Change

We have had more than 50 years of ecologically aware design, and the world is getting worse. If the current increases in species depletion, atmospheric carbon emissions, and pollution levels are indicators of eco-design's contribution to ecological wellbeing, then designers have

failed miserably. It would be easy to adopt a position of blame, and to argue that they have been too lazy, greedy, thoughtless or submissive to change the change. Although there is some truth in this, it would be unfair and unhelpful to blame designers for population increases and government policies. Nevertheless, this paper argues that designers can contribute a great deal more, but that this would mean asking them to work with systems that are far larger and more complex. How would we achieve this? Governments, industries and educators have yet to harness the full potential of designers as social and ecological entrepreneurs. Since 2005, in order to find ways to reduce mankind's net burden on the environment, our research has sought to expand the agenda and repertoire of design. In a 3-year, AHRC-funded research at Goldsmiths, University of London we have been exploring the idea that specialist designers can work in a higher-level, cross-disciplinary design system that, for the moment, we are calling 'metadesign'. One reason for this is that we are still trained to offer relatively narrow, specialist skills, rather than addressing deeper needs. This has alienated us from our wider economic, social and ecological potential. Many designers feel uncomfortable with ethical aspects of their predicament, but their specialist role makes them too weak to affect positive, radical change. For many designers, positive options may seem remote. Others face what seems to be a 'no-win' situation.

- *If a designer declines the chance to make cars 'greener' he, or she opts out...*
- *On the other hand, making cars 'greener' will encourage more people to drive.*
- *How did designers get into this position, and how can we change this for the better?*

3. The Narrowing of the Design Agenda

This paper calls for the creation of a more comprehensive, self-creating design system (i.e. 'metadesign'). Fifty or so years ago, in the absence of more enlightened, far-sighted policies by corporations and governments, a few eco-designers saw individual, quasi-political activism as the only way to change things. In the early 1970s, socialism was in competition with capitalism, and the idea of 'alternative lifestyles' seemed thinkable, or even feasible. Much of this work addressed the wider social questions of health, energy-production, land-use and global resources, etc. However, after the collapse of the USSR's political economy in 1989, the idea of 'alternative' anything (e. alternative lifestyes, alternative technologies etc.) became far less conceivable, politically speaking. While many saw that a global, expansionist, unified economic order might overburden the biosphere (e.g. Brundtland, 1987), it was also perceived as being too powerful a change to be changed, let alone opposed or dismantled. By the 1990s, while the term 'sustainability' warned that ecological limits would be the ultimate boundary for economic development, we were all being asked to imagine the world as a unified political, economic (and ecological) entity. As a result, virtually all socially and ecologically active designers began to work with, rather than against, the economic status quo. By helping to create the 'consumer society' as we know it, designers were persuaded to ignore the big issues such as social relations, food production and distribution. Consequently, we now know a good deal about how to 'de-materialize' products (e.g. Diani, 1992) or how to make them leaner, cleaner, slower or service-based (e.g. Manzini, 2001) rather than product-based. Nonetheless, these, and the many otherwise excellent innovations are insufficient to reduce the net environmental damage caused by globalization.

4. How Can Designers Change the Change?

How can designers work at a higher strategic level in creating beneficial change? Over the last few decades, many of the most spectacular marketing campaigns would have been impossible without a strongly visual contribution by designers. However, it is hard to imagine what design methods could challenge the stupendous forces of economic growth, unless politicians,

bankers and corporations, rather than designers, would take the primary initiative. Yet designers do enjoy a higher status and greater credibility. Ironically, this is because they have made such an important contribution to economic growth (c.f. Florida, 2002). However, politically speaking, in comparison with architects, designers are a relatively junior profession, and therefore relatively weaker. Moreover, even architects have become subservient to the growing power of capital (c.f. Chipperfield, in Dyckhoff, 2007). For example, the increasing power of property developers and the rise of cost-benefit accountancy methods, short-term efficiencies have encouraged them to focus on point-of-sale profits, rather than long-term benefits for all. At present, the current system of economic regulation and governance is managed largely by fiscal policies, legislation and political persuasion. These operate by enforcing rules and inducements that work within agreed categories and boundaries. By contrast, design works at the level of opportunities and affordances (Gibson, 1982), and how users perceive them (Norman, 1988). In this sense, what we might call call 'design thinking' (Simon, 1969) or 'designerly ways of knowing' (Cross, 1990) works more by positive persuasion, than by censure or negation. In short, unlike the negative tendencies within laws (i.e. by drawing categorical boundaries and imposing penalties) designers can transform the world by re-imagining new ways to live.

- *QUESTION: how big is the carbon footprint of rain?*
- *ANSWER: too big...rain is beautiful, but it makes people drive instead of walking.*

5. The Need for a Metadesign Profession

The retrospective search for 'design activism' in the early 21st century (Julier, 2007) may remind us that design has been almost exclusively harnessed to the needs of business, rather than to the needs of society. This is unfortunate, given the tension between the quest for economic growth and the environmental damage it has caused. It may also make us question why most designers are still educated as amenable specialists, rather than enterprising generalists. Indeed, it has been by acting as mercenaries within this commercial context, that designers have created most damage. This question was one of the main motives for challenging existing models of design practice. There have been several attempts to re-design design, in a way that make it more effective, consensual, distributed, influential, or versatile. These echo what John Dewey (1939) and John Chris Jones (1998) have described as 'creative democracy'. Similar sentiments emerged in the 'Creative Commons' and 'Open Design' movements that offer new potential for social integration, and other benefits. In our research we chose the term 'metadesign' because it is already familiar. The Greek word 'meta' originally meant 'beside' or 'after' but is now also used to imply the possibility of change or transformation, including self-transformation. Although 'metadesign' may describe a preliminary activity that precedes orthodox design it can also refer to a possible design practice that re-designs itself in an ad hoc way. The idea of metadesign therefore acknowledges that future uses and problems cannot be fully anticipated at the creative moment of design. One of our aims is, therefore, to create a non-hierarchical community of designers, and other experts who can seed a new metadesign methodology and profession. Two of the key obstacles we encountered are the prevalence of ego, and the hierarchical tendencies within society.

6. The Currency of Self-identity

It is often argued that western rationality emphasises individual, rather than collective actions. The notion of 'self-awareness' seems to have emerged from a pitilessly competitive (Hellenic) culture in which self-assertion, rather than 'self-satisfaction' was seen as a public virtue. Socrates introduced a more philosophical dimension to self-knowledge when he argued that it is a pre-requisite to knowledge. Much later, where, hitherto, mankind had always believed that ideas come from God, John Locke (1689) advanced the notion that individuals were capable of

originating new thoughts. Between the 16th and 18th centuries, keywords such as a 'self conceit', 'self-confidence', and 'self pity' had emerged, and Coleridge (1772-1834) had coined the term 'self-consciousness'. These ideas also had an impact on the ideology of money. It is hard to think of ‘market forces’ without acknowledging Adam Smith’s famous idea of the ‘invisible hand’ (1776). Arguably, the modern version of this idea is that, as consumers, when we spend money to enjoy ourselves we can reassure ourselves that we are supporting the economy, thence, society as a whole. By the end of the Enlightenment, the Socratic idea of the individual had come to be understood (after Leibniz, 1898) as a self-defining and self-owning citizen. It is for these historical and cultural reasons that we now tend to see the primary duty of industry as meeting the needs of individuated consumers, rather than supporting society at large. This also suggests that the duty of the consumer is to choose the right products to make him, or her, ‘feel good’ and ‘look good’.

7. Designers Can work in New Ways

Today, design is strongly identified with the system of consumption. Today, many products and brands achieve their distinctiveness at a multi-sensory level. Sport, fashion and cosmetics frequently collide in strange ways, and terms such as ‘Hoover’ and ‘Google’ may be used as verbs, as well as nouns. Products such as the ‘Dyson’ and the ‘iPod’ represent an integration of name, form, function, and – more importantly – habit. It is surprising, therefore, that the designer’s primary contribution is predominantly visual, rather than verbal. This is so familiar to us that it may seem natural. But designers have long played a role in advertising campaigns in which words and images are persuasively combined. This combination of signs and functions will be important within the ecological design of the future. This is because neologisms are potentially transformative. Where many tabloid newspapers and business cultures tend to ‘dumb-down’ the discourse by reducing the vocabulary (cf. Orwell’s ‘1984’), advertising designers seek to enrich beliefs and, therefore, behaviours by introducing new narratives and words into the language. A non-commercial example of this method is the word ‘Genocide’, which was coined in 1943 by Polish legal scholar, Raphael Lemkin (1900–1959). For years, Lemkin had tried unsuccessfully to draw world attention to the military excesses of certain nations. Eventually, by combining the Greek word ‘genos’ (family, tribe or race) and the Latin word ‘occidere’ (to massacre) he created a new word. Only after his word was made public did the United Nations formally recognise the problem. Today, his word is enshrined in the Geneva Convention, and we all recognise genocidal behaviour where, previously, it had not even seemed to exist. This example can be reframed within the discourse of design, where similar gaps in the discourse of ecological design can be found. If conceptual gaps can be located and filled with suitable neologisms there is always a better chance of new ideas, beliefs and actions taking place.

8. Ten Characteristics of Metadesign

i) Metadesign creatively intervenes at the level of language

Arguably, designers can ‘language’ the opportunities for change by redrawing the known boundaries of what ‘is’. Therefore metadesign should also intervene at the level of language. Language informs cultural values, and these inform aesthetic norms. Aesthetics helps us to experience the world in particular ways. All of these processes guide different behaviours, habits and trends.

ii) Metadesign has tools for ‘thinking beyond the possible’

If we believe that something is possible it has far more chance than if we believe it to be impossible. In today’s rational society, many people tend to confuse the ‘unthinkable’ and the impossible’. This can be easily remedied. When we try to describe the ‘impossible’ more clearly it may become more ‘discussable’. Once we try to discuss it, it will slowly become more ‘thinkable’.

Once the 'thinkable' proliferates it will become more attainable. Once the ‘attainable' is perceived to be attractive it becomes more commonly applied (Wood, 2005; 2007:2).

iii) Metadesign is intended to deliver ‘synergies-of-synergies’

Metadesign is intended to deliver synergies-of-synergies. It takes a minimum of 2 players, or ‘agents’ (i.e. facilitating 1 possible relation) for a ‘first order synergy’ to emerge. It is what happens when two, or more agents combine to create a new outcome whose properties exceed the sum of properties of the individual agents. Subsequent ‘orders’ of synergy emerge when first order synergies are combined to create new synergies. This process may continue into successive orders, although their increase is dependent on the number of agents at level 1. Hence, for example, 2 agents cannot produce any subsequent orders of synergy. A cluster of 3 interactive agents can only produce three synergies at each subsequent order, up to infinity. With more than 3 agents, the rise in the ratio of primary agents to subsequent orders of synergy is exponential. For example, a cluster of 4 interactive agents would produce a maximum of 6 first-order synergies, which could produce 15 second-order synergies, which could produce 105 third-order synergies, etc.

iv) Metadesign tasks are too complex to be undertaken by solo practitioners

Metadesign is intended to address highly complex issues that may range beyond the expertise of individual designers. Its practice is always, therefore, expected to take place within carefully selected, and trained, teams.

v) Metadesign outcomes should surpass the individual potential of participants

Metadesign should surpass the outcomes of individual participants. Metadesign is intended to synergize the efforts of many experts, and therefore requires appropriate team-management methods. When these are effective the quality of outcomes should be higher than the best work by either/any members of the team (Van Nieuwenhuijze & Wood, 2006)

vi) Metadesign teams deliver many-layered, integrated innovations

Metadesign teams deliver many-layered, integrated innovations. Literally speaking, the term ‘entrepreneurship’ describes a ‘taking from within several sources’. By contrast, the notion of ‘entredonneurship’ (c.f. Wood, 1990) describes a ‘giving, from within several sources’. We have developed a system for facilitating a number of parallel innovations. This can satisfy the apparently incommensurate requirements of different vested interest groups. A four-fold version of this is called ‘quadratic reasoning’.

vii) Metadesign fosters, and benefits from, ‘team-consciousness’

Metadesign should foster, and benefit from, ‘team-consciousness’. It depends heavily on the development of ‘team (or ‘network’) consciousness’ for successful co-design to take place in a creative way. This needs to be mapped, but it represents a ‘field of shared knowing’ (c.f. Bert Hellinger, quoted in Hemmings, 2008) that is too complex to quantify. Controversially, Marvin Minsky has argued that consciousness is merely a ‘low-grade system for keeping records’, and that ‘machines are potentially capable of far more consciousness than we are (Minsky, 1988, p. 160). While this model is crude, it nevertheless enables metadesign teams to map salient parameters in a truly holistic way.

viii) Metadesign delivers complex outcomes that are interoperable

Metadesign delivers complex outcomes that are interoperable. Metadesign methods are effective when work achieved remains equally recognizable, amenable and usable by both, or all, collaborating participants.

ix) Metadesign's fractal structures bring unity to very large systems

Metadesign can offer fractal structures that unify very large systems. Metadesign offers a (generic, four-fold) relational model of ethical praxis whose elements are configured as a fractal structure. This means that it can be re-scaled from the smallest (e.g. individual citizen) to the largest (e.g. global society) without compromising its form. This has the advantage that it is a configuration that is shareable across very different domains, territories, cultures etc.

x) Metadesign uncovers unexpected potential for other systems

Metadesign uncovers unexpected potential for other systems. Our tools for metadesign enable outcomes from one project to be applied within other systems.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

A Taxonomy of the Changing World of Design Practice

A vision of the changing role of design in society supported by a taxonomy matrix tool

Professor Robert A. Young[1]

Abstract

Design academics have advocated the need for design to re-orient towards more sustainable outcomes and for a change in the role of design in society since the start of the millennium. Design has entered a brave new world where boundaries are crumbling and design disciplines are blurring yet the word design has become hackneyed and references often obfuscate its real impact, particularly the emerging role of designers in contemporary society. This paper presents a vision of the role of design in our lives and society in the form of a taxonomy matrix, derived by comparing literature with reflections on design practice projects undertaken between academia, industry and the public sector, which demonstrate characteristics of the changing nature of design practice.

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1. Introduction

Design academics have been advocating the need for design to re-orient itself towards more sustainable outcomes and for a change in the role of design in society since the turn of the millennium (e.g.: Cooper, Manzini, Young), when the UK Chancellor of the Exchequer hailed design as vital to the future of British Industry in 2005 and design was cited as central to the UK economy in an influential government report (Cox), we knew that times were really changing. Design has entered a brave new world, a world where boundaries are crumbling and design disciplines are blurring. A world filled with 'T' shaped designers working side by side with scientists, engineering, computing and business professionals.

What then can we remark about design practice? Design became a hackneyed word over the last quarter-century. A conference presentation by Prof John Heskett made this point back in the early 1980s (Heskett 1987). The term is now used interchangeably with that of 'innovation' and is seen as a touchstone to denote contemporary thinking. The Design Council in the UK has been vigorous in its promotion of the link between successful innovation in business through use of design (Design Council), to such an extent that the association now has become accepted and automatic to many both in the worlds of design and business. Much less attention is given to articles which question this new orthodoxy for example James Heartfiled's criticism of; 'The Creativity Gap' in the creative industries in the UK (Heartfield 2005), which argues that whilst: "Good business may lead to more and even better design. But more and better design does not, by itself, lead to good business. To imply as much is just hyperbole. But then the design business has never been short on that." This thinking shows that despite the Design Council's claim, 'design spending is the dependent, not the independent, variable' in business practice. .

Design has long been appreciated for its style and is seen to be synonymous with fashion, modern culture and aspirational lifestyle, but these stereotypical references to design have obfuscated its real impact, particularly the emerging role of designers in contemporary society. This paper presents a vision of the emerging role of design practice on our lives and our future society in the form of a taxonomy framework or matrix. It is derived from the comparison of design process literature with reflections on a selection of collaborative design practice projects and events undertaken between academia, industry and the public sector, which demonstrate characteristics of the changing nature of design practice.

The research underpinning this paper was undertaken to address a challenge now facing design and designers to better articulate its substance. But if we are to move Design beyond its stereotypical reference, (within industry this would move it out of the studio and into the boardroom) then we need to inspire and convince people with more than our innate creativity. First we need to fully understand how design thinking and processes can and does add value to businesses, products and services in the private sector but also organizations, communities and their endeavours in the public sector. Then we need to communicate these benefits and show clearly how design can and will act as a catalyst for positive, sustainable change to the economic, political, ecological and social future of our countries and their societies – now and in the future. Developing this understanding requires an ability to reveal more of the tacit understanding that Designers bring to the contexts of their work (Polanyi). Communicating the benefits is a real challenge to designers and design academics, which typically spend their time concerned with the objects of designing rather than portraying the benefits of the design process to others not trained as designers.

Obviously Design will not achieve this change in isolation. Although it has a central role to play, it is only by working with different disciplines and partners that it will be able to deliver the holistic solutions that will drive change forward. Northumbria University, School of Design has a history of working collaboratively with companies and organisations on design practice learning projects to explore the forefront of evolving design practice. This paper and its presentation at Changing the Change intends to take its audiences through a journey of design, specifically how it has evolved within a generation. It does this from reflections on the practice of the School's work and the work of other notable projects with external collaborators and on multiple academic perspectives of the teacher, researcher and design practitioner. The journey does not dwell on the outcomes of designing but on the synthesis of reflections of its purpose and rationale.

The synthesis of the vision described in the paper is assisted by three aspects which have been recurrent throughout the author's research into and through design practice, in order to frame it. These concern design *contents, processes and contexts* (Young 2004, 2005, 2008). This frame works in conjunction with the three types of knowing referred to by Polanyi in his book; 'The Tacit Dimension'; tacit, implicit and explicit knowing (Polanyi). The frame of reference considers:

- The traditional role of the designer
- Design as a Creative Process
- The increasingly strategic use of Design and design thinking in business and society
- Why design is continuing to grow in importance and how it will affect our wellbeing and sustainability
- What are the emerging challenges and opportunities for the Designer and the Designer's influence on society?

The frame or triad of key aspects (content, process and context) is used to discuss the research reflections in the body of the paper against each of the considerations above.

The paper is based on the author's reflection on experiences within the Northumbria University School of Design, where the academic and pedagogic aims concern engagement in design practice learning. The reflections therefore represent considered views which have evolved from a research, research-led practice and academic teaching position within a School that is regarded as a leading provider of design practice learning and associated knowledge development. The paper uses a matrix (Table 1), which is progressively added to using triads of descriptive terms to assist the synthesis of thinking in relation to the bullet points of consideration above, to portray the author's reflections from design literature and selected design practice projects into ideas and insights (a vision). This is finally brought to a conclusion as an integrating vision to frame the nature of the changing state of design. The matrix therefore represents a taxonomy (or tool) which provides both narrative and artifice to understand and engage with the change as a topic of learning, research and design practice.

Table 1: Taxonomy Matrix of Triadic Descriptors

2. The Traditional Role of the Designer

Table 2: The Traditional Role of the Designer

Content

The chosen descriptor to characterize the content of traditional design practice is *Material*. This refers to the traditional role of the designer as the specialist who conceptualizes and configures the physical nature of a product or artifact design. The selector and manipulator of materials into things, products and artefacts. A superlative example of this content is the Apple I-Phone, which is described as surpassing expectations with its user interface and attention to product detail.

The concepts of beauty and order in content creation have arguably moved from the application of precise rules – prescriptive principles of beauty and order, such as the concept of entasis in the definition of the shape of a column in the context of traditional architecture – to assimilative processes of learning the art of design in design practice teaching studios. This contemporary approach concerns much of our man-made environment, and has led to the development of a tacit way of knowing and doing design.

Typical early contributory theory was based on knowledge built on concepts of historicism (e.g. the history of art and design where the emphasis was on the artifact and then the lives of the artists and designers themselves rather than the process of designing). Consequently, the branch of design history which has been perceived by practising designers as most relevant to their work was that of phenomenology for example the work of Margolin and Balcioglu T (Margolin & Balcioglu 1998).

Another important generic characteristic of design practice disciplines is the growth of importance in human centred thinking about design problems. This has naturally led to content or knowledge to support designing derived from the human sciences, specifically human factors, ergonomics and usability – being themselves not pure academic disciplines but aggregates of theory.

Process

Making is the chosen descriptor to characterize the process of traditional designing. Another keyword descriptor could be *Magic* in reference to the description of the process of designing, or lack of it, involving the creative leap that designers often dismiss as magical in fear of becoming too prescriptive about the intuitive nature of their way of working. Other characteristics of the process include:

- Learning to see – through sketching
- Seeing beyond and seeing differently, seeing from different perspectives which is the basis of the creative impetus and process
- Ways of knowing involving designing are largely tacit rather than explicit or even implicit.
- The importance of pattern matching and recognition and coalition across complex sets of data in visual, tactile ways.
- The ability to combine unrelated structures and to get out more than you put in
- Ways of communication
- Ways or learning and exploring

Craft skills were and are of utmost importance to traditional product creation and development. These enable a journey of exploration, of thinking in the round, the refinement of ideas about the configuration of form to the point of specification of surfaces, edges, patterns and relationships. Again, Apple products are an excellent example of this process of form giving, where the designer captures the zeitgeist at the point of product launch in terms of functional elegance and desirability of the product as a cultural icon.

Context

The legacy of traditional design practice is that of Modernism, however, the paradigm that drives the context of product and artefact development is *Materiality* or consumerism. Other keyword descriptors characterizing the traditional use of design in society for the purpose of this synthesis could include; *Measure and Man-Made world.*

The traditional role of design is ‘design in context’, where the context is set by business and other disciplines have a greater influence in decisions about what is designed, produced and consumed. In the face of the contemporary problems in society, rather than the traditional role of

the designer being seen as a passage to a better world, many now believe that it is generating more problems than it is solving (Thackara). Other characteristics of the context include:

- Two and three dimensions – but increasingly now the 4th dimension, brought about by the advent and development of digital technologies and the subsequent convergence of design disciplines i.e. industrial and graphic design in the context of screen-based products.
- Art and Science divided
- Types of knowledge and learning preferences, include kinaesthetic as well as aural and visual
- Developed sense of intuition
- Right brain thinking and thinking flexibly with both halves of the brain
- Design includes logical and deductive processes as well as inductive or abductive processes (Buchanan).

The context of traditional design practice also saw the emergence of Design research in the 1960s.

3. Design as a Creative Process

Table 3a: Design as a Creative Process

Content

The chosen descriptor to characterize the content of design as a creative process is *Method* . Design methods, based on the notion that design could be described as a scientific process, was the focus of early design research work in the 1960s. This work became seriously questioned by its proposers, who realised that scientific method was at odds with design method. For example, designers don't normally ask why, rather why not? Their approach is more about optimism rather than skepticism.

The outcome is that the majority of design research as a theoretical concern has not made an impact on the work of practising designers. Most of this work attempted to produce increasingly more accurate models to describe the design process. The aspects of what

designers concerned themselves with i/e/ content and the situation of its occurrence i.e. context were largely ignored (Young 2004).

Process

Meaning is the chosen descriptor to characterize design as a creative process. The School of Design at Northumbria has a strong profile and interest in developing knowledge about the creative process by observing and reflecting upon its practice. This has resulted in our work being described as Practice-based research, Practice-led research and Research-led practice into designing.

In this sense our work, indeed most of the work of design researchers in our sector could be seen as the generation of reverse engineered theory. We work in the opposite direction to most other disciplines. As Shon explained, we move from the murkiness of real world practice to eventually derive explicit theory and knowledge. Whereas, the academic norm is to move from established pure theory, to applied theory and then case study based on the experience of professional engagement (Schon 1991).

Our ways of thinking and thinking styles move over different stages of divergence and convergence. We also go round in circles in order to progressively refine our thinking about design problems and usually work both ends against the middle of a project to ensure that the best ideas are realised within a deadline. This requires qualities of discernment and holistic thinking and the capacity to zoom into granular detail and out again to conceptual schema.

But the most enigmatic aspect of our process as designers and the biggest point of intrigue for those who are not is the point of generation of creative ideas. This aspect baffled the early design research movement in the 1960s, who attempted to develop a design science method. Perhaps the most informative work that has researched into creative insight is that of Davies and Talbot – Experiencing ideas: identity, insight and the imago, published in Design Studies 20 years ago (Davies and Talbot 1987). This draws on a series of interviews they conducted with RSA Royal Designers for Industry about their moments of insight.

They produced a list of key experiences based on the analysis of interviews with the RDIs. (Table 3b) which some would say bears more relevance to religious experience than professional experience.

Having an idea & knowing it's right is based on the experience of:

- Oneness
- Transcendence of self
- Experience of paradox
- Certainty of knowledge about something being worthwhile
- Deeply felt peasant ecstatic feelings
- Defies analysis – impossible to analyse
- Sense of involvement in something that is ultimate and universal
- Sense of the sacred
- Unique sense of harmony and synthesis
- Effortlessness
- Sudden occurrence
- Obviousness

Table 3b: Key Experiences of Creative Insight

Imago refers to a state of consciousness or being in which there is experience of final perfect form. The glimpse of a higher form of consciousness. An immediate consequence of imago experience is that the person experiencing it is motivated to seek it again and again. Its reward induces an addiction, a kind of Eureka fix.

Changing states of design now means that designers have to be T shaped people (Iansiti 1991). That is people with a core discipline (the dowstroke) and the ability to communicate and work flexibly with other disciplines (the cross-stroke). “Not to be confused with a ‘Jack of all trades’ T-shaped people have a core competency, but can easily branch out. And they possess curiosity, empathy and aren't afraid to ask why” (Brown 2007).

Context

The chosen descriptors to characterize design as a creative process are *Multi-dimensional and Multi-sensorial* . Other characteristics of the context include:

- The Post industrial society
- Theory – practice divide
- Davies and Talbots’s research was also corroborated by Michlewski’s PhD in the School of Design at Northumbria concerning the affect of design culture on organisations in terms of theories, methods tools and techniques, making meaning and making things happen (Michlewski 2006)
- Embracing complexity and ambiguity, Embracing personal and social empathy and Engaging polysensorial aesthetics (Michlewski 2006)

An interesting outcome from the growth of importance of design in society is the Design Council’s interest in mapping the design process to make it more accessible to others. Whilst this might result in better recognition for the work of designers it might also be seen as too prescriptive of the design process.

4. The Increasingly Strategic Use of Design Thinking in Business and Society

Table 4: The Increasingly Strategic Use of Design Thinking in Business and Society

Content

The chosen descriptor to characterize the content of the increasingly strategic use of design and design thinking in business and society is *Modality*, Modality refers to the channels of communication and data follow and different modes of being– other keyword descriptors include; *Mannerisms*, which are an important point of study in people for strategic design.

Perhaps the most obvious sign that we need better methods of designing and planning is the existence in industrial countries, of massive unsolved problems that have been created by the use of man-made things, e.g traffic congestion, parking problems, road accidents, airport congestion, urban decay and shortages of such services as medical treatment, mass education and crime detection (Jones). Strategic design content includes Interaction design, Interface Design, Usability and User Centred Design, System operated Product Design, Experience Design and Service Design, which are all concerned to varying extents with the complex relationships between people, products, places and processes.

Here, content knowledge of human factors elements is crucial. Also, the level at which design problems are framed and decisions are taken about them (Fig. 1). The author's work to reconcile the changing states of design content with adequate processes to facilitate student learning for appropriate contexts, was initially based on a detailed review of a complex system design project. Levels of design decision making were found to reside at different levels of design content. Getting the right conditions to improve decisions about content were found to be crucial (Young 1989).

Typical contributory theory here is based on knowledge built on adaptations of social science disciplines such as anthropology and ethnography but translating data from the use of these disciplines into people-centred design opportunities.

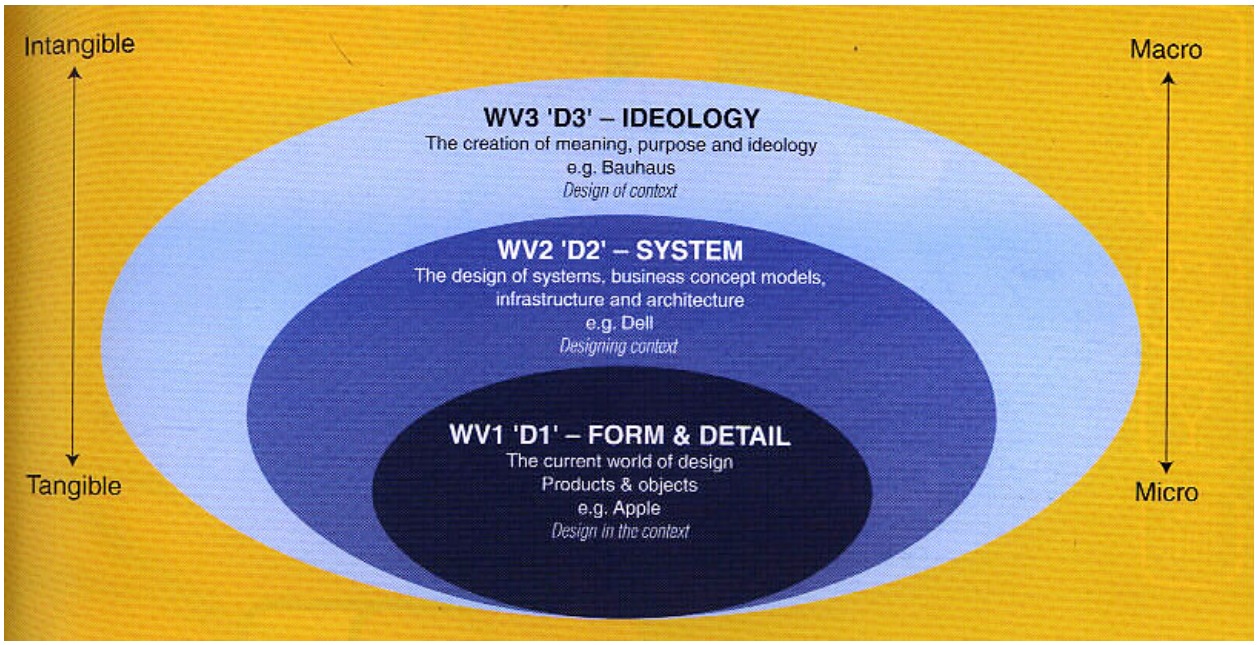

Fig. 1 Model of Levels of Design Content

Process

Mimesis is the chosen process keyword descriptor to characterize the increasingly strategic use of design and design thinking in business and society. Imitation and empathy in the design of services and systems of operation to mimic and complement the behavioural patterns of people. Other characteristics of the process include:

- Not so much learning to see as learning to listen (DASH 2007)
- Key skills are communicating across disciplines and facilitation
- Key approach of designers is using prototyping techniques to fail early to succeed sooner in interaction and interface contexts for new product development.
- Key purpose is to describe the journey – to identify the touch-points
- Main feature of service design is, that unlike our concept for traditional product design that goes in cycles of starting and finishing a new generation product and going to market, service design starts and just continues – to be refined and evolved
- Product development in the past has been infatuated with the destination – rather than the journey, with outcomes rather than the process
- This is a key learning change for the way we will have to train designers in the future, including the approach of the trainers to the learning process.
- It's lifelong and continual.

Context

eMotion is the chosen context keyword descriptor to characterize the increasingly strategic use of design and design thinking in business and society. Other keyword descriptors include:

- Movement
- The strategic role of design is 'designing context' (see Fig.1)

- The strategic role of design in respect of activities such as service design requires a very different approach to the professional dominance of ‘the designer know best’
- The context lies in the fourth dimension, where time and experience are more important than materials and physicality
- Currently the majority of industry and public sector are not familiar with the nature of service design from the user perspective
- They are unable to easily comprehend the risks involved in service delivery
- Risk assessment is at the heart of all new design projects.

In the indeterminate world of strategic design and service development where complex contexts of user needs, desires, emotions and aspirations apply, the problems of collecting and interpreting user data for the design process has a greater similarity to the nature of processing evidence in a court of law than conventional user centred product design and development. In this situation the point of interpretation can be as enigmatic as the search for truth in the face of expedient legal procedures. In a recent real-time TV drama on BBC TV; ‘The Verdict’ trailer was: ‘The truth is what we choose to hear and believe’. – Designing on this basis needs to be based on trust and integrity or a very close reference to roles and responsibilities for those addressing the design brief!

5. Design’s Growth in Importance and its Affect on our Wellbeing and Sustainability

Table 5: Design’s Growth in Importance and its Affect on our Wellbeing and Sustainability

Content

The chosen descriptor to characterize the content of design’s growth in importance and its affect on our wellbeing and sustainability is *Mutation*. We are now seeing the growth of people-centred solutions. Even our dear NHS has seen the need to move from a service based on medical resource capacity, driven by the available clinical personnel, to a patient focused service! We are moving (mutating) from industry can-do (well at least in the west) and the expansion agendas of nations to service content based on the emancipation of people in society, connected by viral communication systems and global multinational industries. Society is in awe of Innovation and creativity and all things design! Design is the new money. People, companies and public organisations see the need to be different or differentiated – to stand out!

Typical contributory theory here needs to be based on knowledge built, not only on the application of social science disciplines but also political science and arbitration skills.

Process

Mediation is the chosen process keyword descriptor which underpins the growth of design's importance. Other appropriate descriptors include; *Manoeuvre, Management, Multi-processing.*

The increasing understanding in society is that to contend with many of the social, environmental problems confronting our future sustainment we need to employ much better 'joined-up thinking'. Designers' capacity to think holistically and follow through to detailed practical solutions is becoming increasingly appreciated. Designers are happy dealing with the complexity and ambiguity that many other disciplines find intractable. Design has the ability to work in counterpoint using both deductive, analytical and rational problem solving as well as inductive, creative and intuitive processes.

Whilst the advantage of designers using prototyping techniques has already been mentioned under the strategic design consideration above, the concept; of failing early to succeed sooner in new product development, has to be questioned as to whether it is the best best strategy when you are working with people as the object of your designing! The process of 'real-world' working by people in organisations is that; anecdotes constitute their experience upon which decisions are made – design needs to be aware of this. Even in the midst of complex science issues and data, practical decisions are made this way, when scientific procedure stops.

So design can assist science to get across to lay people. It helps to translate scientific concepts in ways that people can engage. Design performs the role of mediator in complex social and technical contexts very well because it is good at seeing all points of view and honouring those that make them. It is also good at pattern matching potential solutions.

Context

Memorable is the chosen context keyword descriptor for this consideration.

Companies are curious about the level of creativity that designers can bring to bear in relation to their organisation because they are becoming increasingly aware that design is influential in changing the creative and innovative performance of businesses. Nevertheless, as GJ Galbraith famously remarked, the business of business is business (Galbraith) and businesses are naturally risk averse to the untried and tested. This is a challenge to the creative professions and for designers who wish to expand their level of influence in and through their work to the greater sphere of concern. And the proclivity of design is to have an ambitious sphere of concern. In this context of growth of design, a mantra principle of sustainment to emulate is that of Gaia! This eschews professional arrogance and requires real collaborative working.

Whilst designers have been described here as optimists, the concept of Utopia is realised as being unattainable. Designers are right brain thinkers in an increasingly right brain world. The prize for industry is that they seek after the most memorable experiences that will leave their customers and users coming back for more! But brand reinforcement cannot be the only target.

6. Emerging Challenges and Opportunties for the Designer

Table 6: Emerging Challenges and Opportunities for the Designer

Content

The chosen descriptor to characterize the content of emerging challenges and opportunities for the designer is *Multiplex*. For how do we teach the Wired Generation or the Mosaic Generation – Generation Y otherwise known as the Millenials (Sharp)?

This generation thinks differently. They are also predominantly right brain thinkers. Their drift is to study the arts and humanities rather than science and technology. Dick Buchanan of Carnegie Mellon University talks about the importance of oratory for design education (Buchanan). One of the liberal arts and sciences advocated by the Greeks and then the Romans. It forms the 'Trivium' of subjects that scholars were meant to become proficient in. His point is to underline the importance of verbal exchange of ideas and the communication of understandings between designers and clients and users. Perhaps we can go further here in support of the importance of effective storytelling in order to meet the multiplex nature of design in the future. It is not enough to produce isolated representations of design intent locked into a drawing or model or artwork or even an animation that does not communicate the full extent of a new product or service context. Designers need to become the new chattering class!

Process

Multivalent is the chosen process keyword descriptor which characterizes the content of emerging challenges and opportunities for the designer. Other characteristics of the process include:

- Emergent design is about the power of ideas
- Creative thinking without boundaries
- Naming and framing skillfully to develop sophisticated design briefs, because the bigger challenge is not designing a solution to a problem but deciding what the nature of the real problem is and how it might be addressed
- The power of stories to communicate ideas for risk assessment by boards of industry and public sector organizations
- And of course – sense making and making meaning – always!

Context

Morality is the chosen context keyword descriptor which characterizes this consideration. The emerging role of design is ‘design of context’ (see Fig. ?). Examples of this type of design have already been piloted in the School of Design with companies such as Unilever and Philips **(Unilever and Philips Slide)**. This form of design is:

- People focused
- Future facing
- Based on intrinsic creativity and modes of design thinking
- Requires high levels of craft skill and technique e.g.: film making and narrative building
- Putting creativity to work
- Making things happen
- Using design as an agent for change in society.

These are principles of Northumbria University, School of Design’s philosophy of working. They are as relevant to design at this level as they are as a guide to support design activity at the traditional/contemporary end of design principles involved in product and artefact production.

Society is infatuated with immediacy ‘right here-right now’ and global industry has to operate in this context. The problem for many industries is that this context includes a process of due diligence around the testing and validation of new products and services before they can be realised or commissioned. This squeezes much of the traditional gestation process for new design thinking out of the process of new product development. Therefore, the role of leading international University Schools of Design concerned with the development of design practice learning for real-world contexts is that of ‘slow-reactors’ in a fast reactor context! By this I mean that there is an important role for these Schools in the proliferation and development of vital ideas for consideration by industry in an off-line context.

The bigger challenge for education was alluded to in the Cox Report on Creativity in UK Business (Cox), that of building truly interdisciplinary programmes of learning to ensure the maximum capacity of industry to implement innovative business practice. This requires that students in the Schools of Design, Business and Engineering as well as other disciplines, are capable of understanding each other in the context of mutual learning. Northumbria is committed to embracing this integrated form of educational experience and is building a Design Lab (nuDIL) to pilot this type of working.

7. Conclusion - Towards an Integration

Table 7: Towards and Integration

Content

All of the derived triads or key descriptors, across the points of consideration are shown on Table 7! These show a movement from the material and physical and micro scale to the increasing concern with the evanescent and macro scale of design problems. It is not that the traditional domains of product and artefact creation are of less importance nowadays, just that the complexity of dealing with the human condition in the modern systems supporting our lives has become more prescient. This also requires a better fusion of mind, body and soul / spirit on the part of design activists to see projects through to successful completion.

Process

The problem for design is to assist the learning of tacit knowledge – (which is hidden or incapable of being described easily) in the design process to implicit knowledge (capable of being revealed through the development of skills and knowledge) to explicit forms of knowledge.

Design has evolved sophisticated ways of teaching (project-based learning) in order to help develop these different types of knowledge in its students. But the processes are still seen as largely esoteric by our colleagues in other disciplines. We need to become better at explaining the values of our processes, even though the resulting outcomes (content) usually speaks eloquently to the world.

Context

Design in society in the developed world – some would say the 'wrongly developed world' (Thackara) compares with the needs and aspirations of the emerging and developing nations. At present – 3 product groups in western society cause 70-80% of the total environmental impact in cities, i.e. Home and related energy use, mobility (air and road transport) and food (meat and dairy produce) (Thackara).

Aspects of growing concern in society that need creative and innovative solutions to help improve or alleviate them include:

- Diminishing natural resources – food, energy and water
- Terrorism and
- The increasing proportion of older people in society.

These represent real challenges for designers as part of bigger multi-disciplinary teams. We can begin to appreciate something of our current context by taking a look at previous worldviews of thinking in civilisations. This review, based on that depicted by Henryk Skolimonski, shows that the industrial era that we now live in can be referred to as 'Mechanos' (Skolimonski 1994). A view of the universe based on a clock-like metaphor, moving according to rational and deterministic scientific laws. The telling feature of Mechanos was the movement to detach thinking based on ethics and values from those of rationality, logic and science.

Following in the footsteps of Skolimonski, a bold step would be to suggest that the next paradigm should be based upon an attempt to unify the split which has previously appeared in Western civilisations as a result of Mechanos: to reconnect value and logic in our approach to the perception and design of our world. This would require a new form of education or learning to prepare the designer or 'new creative professional' for the context of their practice. Perhaps we can refer to such a new paradigm of learning and practice for the designer as 'integro'. A concept previously presented by the author at the International Congress of Societies of Industrial Design

in 2001, the thinking system upon which this paradigm is based would include human centredness & field perspective, sustainability, inclusivity and equity, holism and appreciation (Young 2001).

But before we get carried away with our aspirations here we need to remember that: very little, if anything, is completely new. It is the way in which existing elements are combined in novel and exciting arrangements and applications that determines creative opportunity, new applied knowledge and innovation. Also that the 'imago' of the designer is the elixir that drives his or her work. It is a fragment of the divine in our lives.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

360°EYE ON SUSTAINABILITY

An experimental research approach to construct an useful sustainable language

Anna Zandanel[1]

Abstract

Today's misunderstanding around sustainability prevents users from becoming aware of what the whole understanding of this concept.

Trying to divert the direction of the current misleading "changing attempts", research should be oriented to unveil, demonstrate and communicate REAL sustainability, and not its supposed or superficial aspects. It should take into consideration every important aspect, both for design and for the comprehension of the final results.

In a Foundation experience we tried to convert a complex work into a method to produce some different, maybe better approaches to the problem.

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1. Introduction (misunderstanings around sustainability)

At the moment, the concept of sustainability is mistaken because of a kind of confused approach, mainly connected to disinformation and to the tendency to label objects as “sustainable” also when they are not, in line with a sort of trend that denigrates the concept and falls short of the connected expectations.

I will speak about sustainability from a design and product point of view, strictly oriented to the final user's needs. With “sustainability” I will mean the dimension of the design, applications and communication possibilities that regards the user itself.

I think, in fact, that the main aims in this fields are the conscious design and the good information.

Disinformation is an huge problem. Also the European Commission underlines the problem in the Green Book on the Energy Efficiency, on 2005, speaking about “information and education as two underused tools”. They tell, in fact, that Europe needs a great sensibility campaign. They tried to do it form 2005, because the problems are “lacks in public information and education”, and not only about the energy question! (European Commission, 2005, pp.20-21)

Often, it happens that the eco-friendly aspect is announced with emphasis, but badly explained or studied. The user, instead, should be involved at 360°, not only pushed to the purchase by the illusory idea of using-cost savings.

If the product is analysed through every discipline involved in human wellbeing, we would surely get to the concept of real sustainability, and we would achieve greater success. To do this we not only need to consider the current attempts (even if adequate) at achieving sustainable design, but also the psychological and social impacts, and the user's approach to them. Interdisciplinary approaches to sustainability are necessary because even when it is very good, just a designer’s knowledge can not be exhaustive in every field.

2. Aims (trying to work in a different way)

When I speak about “real planning sustainability” I refer to the attitude that should be the kernel of the process of design, production, use and divestment.

I refer to a kind of approach typical of “good design” that requires each of these aspects to work simultaneously and entirely, not individually.

In order to reach a sustainable result from all points of view, a really good design should take into consideration, in parallel, all these elements and give each of them the same relevance.

The main aims should be:

- **to associate sustainability with planning, society and consumption,**
- **to always take users in consideration**
- **to work together** with all the disciplines able to help the achievement of the goals.

So, to achieve our aims we have to consider human being at the center of research and development. It is, in fact, just starting from people's needs, from each person's needs, that we can get and develop innovative, concrete and effective solutions and ideas.

It is really difficult that just following the market trends something will ever go against the tide and fight against the negative aspects of present economy. Current economy is, in fact, just devoted to profit and it has no interest for the future. Thus it detaches itself from Burtland‘s statements which, in 1987, defined sustainable development as: “meeting the needs of the present, without compromising the ability of future generations to meet their own needs”, and also from the definition of the following World Business Council for Sustainable Development (in 1992)

that considered sustainable development as a tool to “ensure a better quality of life, for now and for generations to come”.

Having lost sight of the real and effective aims, we gave life to a generation of consumer products hardly connected with the concept of sustainability.

In the last few years, acts and laws have been passed to push companies and societies into a more responsible behaviour and, as a consequence, a lot of new objects have appeared, and they have been labeled with an absurd variety of terms and prefixes, underlying their (supposed) belonging to the world of eco-design. Suffice it to mention terms as eco-materials, eco-paints, eco-solutions, eco-efficiency, or the frantic use of the term “sustainability”.

In that way, it has been created a “tendency” or even worse a “fashionable trend” that made the concept of sustainability a stylistic trend (not always well attended) more than a basic value, independent from any aesthetic or production decision. As a consequence, wrong expectations and misleading currents of thought have been generated, giving the idea of sustainability as an added value that increases the economical aspect of an object making it more expensive and elitist.

At present, what is offered to the user is, in most cases, a contest rich in perfunctory and very expensive sustainability.

Even if, at the moment, sustainability can be truly considered as an added value (and this because it is not considered as an essential condition for design procedures), it does not mean that it implies more onerousness.

It is because of the amount of things that are sold as “eco” even when they are not that the user does often not consider this prefix as synonymous of positive quality. The user expects to find a low-quality or inferior product that, in addition, costs more.

Here comes the paradox: actually, what should be an advantage turns semi-automatically into something less valuable, both for its performance and its aesthetics. The message delivered is therefore: more money and lower quality. Lots of literature has dealt with this huge and risky problem. To provide an example, Daniel Williams states that:

“Sustainable design creates solutions that solve economic, social, environmental challenges of the project simultaneously, and these solutions are powered by sustainable energies. [..] Endurance and beauty are central to sustainable thinking.” (Williams, 2007 p.12)

and more:

“As architects we are taught to work on a project until it is done, then move on to the next one. But design, like sustainability is a dynamic and living process. Sustainability is not a point that when reached all is fine. Sustainability is better thought as a continuum [...] A design is sustainable, or it is not. If it is not sustainable, changes can be made to make it sustainable. If it is sustainable, by necessity it will be changing and evolving. “ (Williams, 2007 p.17)

In his famous book on ecodesign, Alastair Fuad Luke tells:

“In his 1971 book, Design for the real World, Victor Papanek confronts the design profession head on, demanding that they face their social responsibilities instead of selling out to commercial interests. [...] By the 1980s three factors, improved environmental legislation, grater public awareness of environmental issues and private-sector competition, ensured that “green consumers” become a visible force. [...]designers and manufacturers applied themselves to the task of making their products “environmentally friendly”, not always with genuine zeal or success. Unsubstantiated claims on product labels soon disillusioned an already skeptical public and green design got buried in an avalanche of market- driven, environmentally unfriendly products from the emerging capitalist- driven “global economy”. (Luke, 2006 p.11)

The main problem is now represented by the confusion that makes users unable to comprehend what could follow the understanding of the real concept of sustainability. A whole understanding would enhance necessary changes for the preservation of our planet and of future

generations, and it will bring positive “side-effects” connected to the improvement of the environment and of people’s quality of life.

In this respect, in Italy, Serena Omodeo Salè, talking about ecology, stated that the term sustainability has lost its fascination because it has been abused. She adds:

“[..] c’è bisogno di una migliore economia che diventa benessere e assenza di aggressività (all’ambiente). [...] qualunque approccio ambientale non piò che essere globale.[...]”(Salè,1996. p.8)[2]

The problem is really deep. At the moment there are still different issues linked to sustainable products:

“la comunicazione pubblicitaria, che introduce confusione nella percezione e nella valutazione dei prodotti [...], l’impossibilità di creare attualmente un prodotto che non presenti impatti sull’ambiente [..], (il fatto che) pochi progetti siano frutto di un re design interno, attento a materiali e a caratteristiche ambientali [..]

Sarà quindi necessario strutturare progetti Più APPROFONDITI [..] e progetti COMPLETI,[...] stimolando la collaborazione tra settori diversi. [..] (perchè) bisogna passare da una produzione lineare a una circolare [...”[3] (Salè, 2005, p.52)

This is the reason why diverting the current (not properly productive) idea of “trying to change” means that research will be oriented to unveil, demonstrate and communicate the concept of “more sustainable sustainability”, that will not focus anymore on a supposed, partial or just superficial notion, and that would give greater importance both to design and to the appreciation of the final result.

On the contrary, what is often commercialised results in a very subtle attempt to sell as eco-compatible things that have just little in common with the safeguard of environment and society.

Think, for example, of the pieces of furniture made of natural materials mixed with toxic paints that are passed off as “eco-design”. Moreover, there are creations made of recycled or recyclable materials, selected just because economically cheaper. None of them gives the rightful importance to the needs and wellbeing of users, environment and society.

In this respect, Vezzoli has stated:

“Una questione collegata alla precedente, che ha invece sollevato diverse ambiguità, è la **naturalità** dei materiali. L’ambiguità, che all’origine è squisitamente terminologica e che ha trovato e trova ancora credito, nasce dall'asserire che un materiale naturale è un materiale che non ha un impatto ambientale o ha un impatto necessariamente inferiore a un materiale di sintesi. Questo, come si è compreso, è falso per due ragioni. La prima: la natura è piena di sostanze tossiche e nocive [...]. La seconda: praticamente tutti i materiali *naturali* subiscono un serie di processi per essere disponibili per la produzione; e questi processi hanno un impatto ambientale. Oggi è comunque chiaro [..] quali siano i vantaggi ambientali dei cosiddetti *materiali naturali*: sono solitamente più rinnovabili di quelli di sintesi e sono generalmente più biodegradabili [...][4] (Vezzoli, 2005, pp.3)

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2 “Definitely, there is a need for a newer and better economy that is to be translated as environmental wellbeing and non-aggressiveness. [...] every environmental approach must be global..[...] “

3 “Advertisement, which generates confusion in the perception and evaluation of the products [...], the current impossibility of creating a product that has no impact on the environment [..], (the fact that) just few projects are the result of an interior design that gives importance to materials and environmental characteristics […]

It would be therefore necessary to make use of thorough and exhaustive projects and to stimulate the co-operation among different areas […] (because) it is necessary to switch from a linear to a circular production […]”

4 “A question connected to the preceding is the naturalness of materials. The ambiguity, that at the beginning is perfectly terminological and that found and still finds relevance, is generated by the idea that a natural material is a material that does not cause environmental impact or that causes a lower impact if compared to synthetic ones. This is, as understood, false for two reasons.

For all the reasons herein listed, when I was given the possibility to work as representative for eco-design in the Rino Snaidero Scientific Foundation, whose aim is the research for the quality of life at home, I preferred not to think about sustainability as a research criteria, but as a reference value, following the concept that considers real sustainability as the necessary base for quality of life and for ensuring wellbeing at home and out.

One of the requirements was the implementation of a state of the art, aimed at life at home and at the house itself.

The Foundation needed a cataloguing of products, ideas, currents of thought and laws useful not just to define the nature of the products, but also to be discussed and interpreted in the light of an analysis oriented to the identification of critical or strength points, and to be used for a new and more conscious attitude towards planning.

The team, called “creative group”, consisted of different members, representing different fields of knowledge (sociology, statistics, demography, design, eco-design, architecture, biomedicine engineering, economy, ergonomics, color, interaction, micro-finance, etc.)

All of us were between 24 and 35 years old.

The Foundation looks for people who had not been in the job market for long time, to avoid their previous experiences limit the huge possibilities, the ideas or attempts that could be developed in its environment.

However, the main obstacle was exactly represented by the heterogeneity of the team, which, at the same time, was its strength point.

After the beginning of the job, in fact, all the different specializations showed immediately to be extremely rooted, and to have their own “language”, precise and full of meanings.

This was the reason for dedicating the first months to the comprehension and the sharing of terms that change their meaning according to different contexts of use (for instance “sustainability” for some people means just “care for the environment”, while design is for some others an “irrational process”...)

The sharing of in-depth concepts has been very motivating, and it has enabled the research and the development of a more conscious vocabulary.

The sociological point of view about sustainability, the influence that demographic changes can have on it, the planning that should deal with it, the misunderstandings which from time to time have led to discussions and debates, have contributed to create a common team language.

In this way, if at the beginning, while trying to delineate priorities for the research process each of us showed his or her own beliefs about rules and relations among the different disciplines, at the end the ideas about such rules have changed. They have merged together and have developed thanks to cultural exchanges and to a final agreement on the meaning of each term, which has explained itself in its context of use, and particularly thanks to debates, every time preferred to a silent assent.

Once we created a common base for dialogue, the next step was even more important: to reach the state of the art. The bibliographies used as reference were scientific and not, and they were used to establish the values on which we based the cataloguing.

Now, what do we mean by “values”?

The investigation on quality of life at home made it necessary to individuate some requirements for the analysis of the state of the art.

The first: nature is full of toxic and negatives substances [...] The second: practically all natural materials are subject to a series of processes in order to get ready to be produced, and such processes have an environmental impact. Today [...] biodegradable materials bring some advantages: they are commonly more renewable and biodegradable than synthetics.”

So, through bibliography we have been able to underline some gol@h parameters or, in other words, those values that can surely be useful for improving the quality of life at home.

All the representatives for each discipline proposed and discussed the most peculiar references for their fields of specialization, giving life to a list subjected to a constant updating, and used to file all the documents. Some parameters examples are: Genuiness, Accessibility, Energy saving, Aesthetics...

In this way, everything we filed was immediately provided with a reference and with clear reasons explaining why the team had chosen it.

These parameters were born from the in-depth reading of authors that have dealt with the investigated main themes (these analysed by team members) and that openly, or between the lines, affirmed that a particular point could or could not be important for the improvement of quality of life at home.

In other words, once selected an architectural solution, for instance, it was connected with values relevant for the quality of life that the architect associated to the project. Thus, if the source was mentioned together with the pertinent comments about the object that could be found in the same source (or sources), the genuine existence (or the absence) of these parameters could be verified.

In addition to this, in the original edition, the author (in this case the same architect) had to add her personal observation, explaining why she had chosen that architectural creation and which were in his opinion the best qualities, or the worst faults related to the field he was analysing.

We focused our attention also on the **user profile**, connecting it to his **way of living**, and it leads us to the analysis of different targets and to the filing of every object according to its connection with a specific kind of user instead of another (i.e. children, disabled, etc.).

Demography and statistics analysed this parameter in detail and provided us with certified data both to explain people's characteristics and to underline their needs. Their studies brought to light relevant data that pointed out the shortcomings of design in respect to the needs of a certain kind of user.

The **actions** parameter was created in order to better detect the target of our research in relation to the different places they live in. Avoiding the nineteenth century's subdivision of the house into rooms and areas and having in mind the current tendency of merging together all the rooms (i.e. disappearance of the kitchen replaced by the kitchenette), the **actions** parameter gave us the opportunity to classify the objects with more awareness, considering them not just as physical spaces, but connecting them to activities (i.e. sleeping, cooking, eating etc.).

Lastly, to complete the cataloguing of the analysed elements, each time we added the **name of the discipline** that planned and monitored the research.

All the data, from a graphic point of view, were collected in folders, and then gathered to create a database (in constant updating).

The co-operation of different members of the group enabled a closer examination of filed concepts. Once we reached a sufficient number of folders/sheets to analyse, we moved to the following step: data sharing.

The realization of a common base for communication, at that point, was the ace up on our sleeves to convert the team from multi-disciplinary into interdisciplinary.

Thus, sustainability found an extremely fertile land, and many ideas came to life, which were useful for theories, discussions and surveys and which are still to be analysed better.

At this stage, the members of the group were getting along very well and this helped the initial terms misunderstanding disappearance. As a consequence, commonly accepted definitions were ready to be enriched in their meanings. Once unveiled "sociological" or marketing reverses,

doubts and questions (considered also from the point of view of classic subjects, such as ergonomics or product), sustainability, from both the architectonic and the product point of view, showed itself from different perspectives that maybe have never lived together in a so vivid environment before.

Every researcher proposed to the group some topics chosen from his/ her field of knowledge and filed according to technology parameter.

In this way, specialists in various disciplines commented on the data produced by other authors, therefore providing different opinions and comprehensive interpretations.

Then, what about sustainability?

Not only it was studied according to different sciences or points of view, but sustainability itself studied other *formae mentis,* connecting a new deep meaning to what already was or would be, or maybe had already been into the market, discrediting the superficial definitions that reflect only perfunctorily its characteristics.

Sustainability analysed sociological beliefs and it was fundamental to comment on design, architecture and all these appearances that just superficially represent products, ideas and theories in every fields.

Let us give an example: from the sociological field it was proposed an Automated Custom Manufacturing, that is a process with which an user can draw its own object online, and receive it at home, manufactured, in 10 days.

On the website you can either upload a digital design for a product or select another user's design, and within five to ten days, the company has manufactured the components of the product and is ready to ship them back. Customers can also design objects without building them, leaving their designs on file for others to use; the website has a "showroom" where customers can browse through a catalogue that lists pictures and prices of designs and products created by other users.

Sociologist said:

“This is an example of *mass individualisation*. With services like that we will be able to design and manufacture our own furniture. It is the same process that involved television and the whole media industry: from the 1-MANY approach to the MANY-MANY one!.

Eco-designer commented:

“This method deletes many steps from production to user, and it's positive to avoid waste, money and pollution for each step. But I would know how it works exactly, just to understand if user has to know deeply how design the piece of furniture, how use the specific software (in this case it would be not for all) or not (in this case it would be positive have someone that controls that the design is really well done, to avoid waste of materials, energy consumption and so on).

Another point: transports. For the moment it would be difficult for many receive a product by them, for the few locations they are in. “

Sustainability developed in the different fields analysed, and it was sustainability itself to give the user prominence, trying to provide him with the best solutions, avoiding, for the same reason the ostensible ones.

For instance, an aluminum chair (fully recyclable material) was described as “superficially sustainable” not only because it was planned by a famous designer (who did not choose the material), but also because the company selected it just for economic reasons. Moreover, the brand name made the product very expensive, oriented only to an elite generating a social selection. What’s more, it lacked in ergonomics and it was not intentionally recyclable.

On the contrary, a seat from Droog Design was considered as fully sustainable. It was expensive as far as single production was concerned, but more or less easily reproducible and

from a statistical and economic point of view it was within reach of every culture and every purse. It was made of racked grass, was biodegradable and it could be endlessly produced

At the moment, I do not intend to comment on the debate about luxury design, which has got great relevance in the world of design, and which is at the center of many different schools of thought.

What we tried to do was generating useful opinions for the improvement of quality of life at home, being understood that quality of life depends on life itself.

This is the reason why at first sustainability had been considered a planning and environmental value and then it grew empirically, following always more the criteria of other connected fields of knowledge, and appropriated them .

In this way the ergonomic valuation of a chair was conducted not just through ergonomics, but also through “sustainable ergonomics”, as well as sociological events were looked also from a sustainable point of view, and so on.

Once the database was created, we selected the most used values.

We tried to understand which values were used more and why and which missing criteria could be indicative of new or different needs.

In this way, when we moved to the design step, overall research activity, knowledge-sharing and common language represented the starting point.

We began from different vocabularies and, at the end, with lot of efforts and mistakes we were able to create a new common language. We enriched the meaning of the topics we dealt with, and we enlarged the meaning of each word.

Above all we designers, gave up the feeling of “omniscience” that our job requires to be carried on in the best of the ways. Opening the doors to specialists in different fields of research, and above all in planning, we followed the idea that the user has to be studied in the round.

If quality of life at home needs the user as the point of reference, each of the science we represented worked together to meet such need. Sustainability became, for everybody, a basic value and it raised the consciousness that to reach quality of life at home it is necessary to work firstly on the quality of life, and to avoid any kind of mistakes in production, management, use and consumption. And also in society and development.

The research phase was followed by the planning stage that was really brief and concise for contractual reasons. The proposed projects, about which I can not tell more at this time, was conceived trying to follow all the previous (not at all simple) guidelines.

To sum up, I can say that I am not sure of having found the solution for the huge problems that sustainability is trying to hold back. What I can say is that I feel enriched by this experience that, even with its significant limits, had all the same shown how the combined work of different disciplines can only improve the course towards sustainable solutions.

If “sustainability” really has to be a value of reference, an improvement for the user wellbeing and a solution for the future, we need to carry on an interdisciplinary, combined study, that normally is less or quite never used and that should be the starting point for every sustainable project.

I do not know if our team’s projects will be manufactured or not, and if so, how they will be made, if they will fulfill our aims or not, if in the manufacturing stage they will meet more or less problems than other objects. However, I am enthusiastic about the attempt to learn a different approach and, of course, about having enriched my personal idea of sustainable design, and having found other issues to work on and having developed with my colleagues the consciousness that every discipline can produce values for sustainability.

Finally, I am really happy of having tried instruments, immediately when they were created, maybe different from the others, but surly inspiring and worth being used to reach our ambitious goal.

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Fig. 1: The first Creative Team of the Rino Snaidero Scientific Foundation

Fig. 2: “Garden bench”, by Droog Design, Netherlands. This product was present as a good example of ecodesign. No waste, no pollution, of natural materials, no toxic…all the best qualities are in this

recycle
projects.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Rubbings

Preserving the industrial memories amid change

Xian Zhang[1], Ming Cao[2]

Abstract

Based on the investigation of an old mill in Wuxi, the birthplace of China's national industry, the project seeks to continue and expand the life of the industrial culture through the approach 'Rubbings', whose role is regarded as a communicator connecting the past and the present. We not only reveal the long history of the mill, the cool scenes with the special aesthetics, but the workers' everyday subtle life.

The project narrates the past, present, upcoming and imaginable stories through different media expressing the emotions such as recalling, commemorating, reviving, hoping etc., thus the industrial memory, its own value as a culture would get more attention and right preservation finally.

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1. Introduction

Everything seems temporary and easy to be torn down in today's fast changing China. Wuxi, one of "China's Ten Cities with the Most Economic Vitality", is the birthplace of China's national industry, who boasts over half century's accumulation of industrial heritage. However, in recent years, the city's appearance is reshaped so quickly that some historical industrial sites have disappeared in a hurry. Although the recognized industrial heritages have been renovated and reused as bars, galleries, restaurants, museums, and shops etc., their original culture wasn't paid attention to carefully, therefore the past stories have lost to a large extent.

The process of the worldwide recognition of the value of industrial heritage only spanned 30 years, while the large-scale practice of industrial heritage's protection happened in British Iron Gorge in the late 1980s and Ruhr industrial area in Germany in the end of the 1990s. Unlike before, the huge and ugly plants and machinery in these two sites were not removed totally as burdens, but as something valuable to the industrial heritage's protection, rehabilitation and re-use. As a result, the strong industrial culture, unique industrial heritage landscapes attracted investors and tourists from around the world. The old industrial areas revived and now they have been listed as the world cultural heritage. The practice of the new way of protection developed into the international protection campaign of industrial heritage in 2003. Thus " The Nizhny Tagil Charter" was issued and formally approved by the UNESCO as a programmatic document of industrial heritage protection and use. (Yu. 2007, Preface)

According to The Nizhny Tagil Charter,

'Industrial heritage consists of the remains of industrial culture, which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education.'

The Charter also indicates the value of industrial heritage:

I. The industrial heritage is the evidence of activities which had and continue to have profound historical consequences. The motives for protecting the industrial heritage are based on the universal value of this evidence, rather than on the singularity of unique sites.

II. The industrial heritage is of social value as part of the record of the lives of ordinary men and women, and as such it provides an important sense of identity. It is of technological and scientific value in the history of manufacturing, engineering, construction, and it may have considerable aesthetic value for the quality of its architecture, design or planning.

III. These values are intrinsic to the site itself, its fabric, components, machinery and setting, in the industrial landscape, in written documentation, and also in the intangible records of industry contained in human memories and customs.

IV. Rarity, in terms of the survival of particular processes, site typologies or landscapes, adds particular value and should be carefully assessed. Early or pioneering examples are of especial value. (TICCIH, The International Committee for the Conservation of the Industrial Heritage)

However in China till mid-2006, the State Administration of Culture Heritage issued the "Notice on strengthening the preservation of industrial heritage", pointing out that "China's preservation of industrial heritage is a new topic in the cause of the protection of cultural heritage and is of importance and urgency." Then some cities gradually began to recognize the significance of the protection of industrial heritage. (State Administration of Culture Heritage)

This paper focuses on the industrial heritage's 'social value as part of the record of the lives of ordinary men and women', aiming to map out the history and current change of the industrial

heritage in Wuxi, elaborate our view on the industrial memories and exploit industrial design's potential to give conceptual proposals.

We, two young lecturers in the School of Design of Jiangnan University firstly involved into the research of industrial heritage and introduced this to a junior students' course and 3-group senior students' graduation projects. Teachers and students from the Department of Industrial Design have been working together for nearly five months.

The project proposes an approach that uses the conceptual design as a vehicle reflecting bits of the industrial memories, thus continuing the culture's life. It touches the domain of industrial heritage trying to broaden the boundary of industrial design, looking beyond the objects' preservation to the aesthetic possibilities with the local culture.

Rubbings mainly consists of two main parts: the first part discussing the industrial heritage in Wuxi, our understanding of the industrial memories, and the second part presenting several conceptual design proposals expressed as videos, images and objects.

2. Industrial heritage in Wuxi

Wuxi is situated in the lower reaches of the Yangtze River, whose name, literarily meaning "no tin ", was given due to the extinguishing resource of tin in the Tin Hill. During Ming and Qing Dynasties, Wuxi was known as the "rice market", "cloth dock" and "silk market" all around China. In 1895, Yeqin Cotton Mill, founded by two brothers, Yang Zonglian and Yang Zonghan, signified the beginning of the early industrial production. Wuxi became the cradle of China's national industry and commerce by virtue of its wisdom and diligence. Till 1948, there had been over 628 enterprises of 20 types of business covering cotton yarn, filature, flour, printing and dyeing, rice grinding, tile and papermaking etc.

The unique history left Wuxi over half century's accumulation of industrial heritage, such as Yongtai Silk Mill, Maoxin Flour Mill, Qingfeng Cotton Mill, Dingchang Silk Mill, Shenxin The Third Textile Mill, Lixin Textile and Dying Mill, Xiexin Feather Textile Mill and Kaiyuan Machine Tools Mill etc., most of which are located along the 2500-year-old Grand Canal[3]. The industrial buildings scattered by water have an impact on the city's structure and layout, thus gifting Wuxi the distinct characteristics. These buildings, reflecting the early principles of location and operating features, are of great research value as they provide the important evidence for people to explore the history of China's national industry and the plant layout of the early industrial enterprises. With the passage of time, these outstanding industrial buildings will be even more valuable. (Xu, Zhang, and Xin 2007)

Nevertheless, the urban development in Wuxi is undergoing extensive and profound changes. On account of the shift of the urban structure and function, more and more new mills gradually expanded to the suburb resulting in the old industrial zone close to the center city falling out of use. On the other hand, due to the introduction of the modern technologies, traditional industries declined slowly; some enterprises even had to be shut down, ceased production, merged into other enterprises or switch manufacture. The urban reconstruction has been advanced so quickly that quite a few of significant industrial sites disappeared in a hurry. (The Graduate School of Landscape Architecture.)

Fortunately, Wuxi municipal government has been aware of the significance of the industrial heritage and set the target for the urban development as establishing a famous city of history and culture with humanities. In terms of the 'Notice on the Development of the Industrial Heritage and Protection of the Census Work' issued by the Municipal Government Office in April 2006, the government presented the basic idea of the industrial heritage's preservation, namely 'protecting

[3] The Grand Canal, the world's longest man-made waterway linking Hangzhou with Beijing, once played a vital role in transporting goods and even helping to hold the empire together for centuries. Today it is still very busy although other means of transport are widely available.

its appearance and casting its soul', aiming to highlight the comprehensive historical and cultural connotations of Wuxi. The government planned to conduct five important projects: to build a unique protection zone of industrial heritage, so that dozens of various types of industrial Remains beside the Grand Canal could receive the comprehensive protection; to construct four museums of the 'four major terminals' separately, which actually means four types of the pillar industries, once enjoying their reputation in the history of Wuxi industrial and commercial development in the beginning of the last century, namely the Rice Market Museum, the Textile Museum, the Silk Museum and the Museum of Money; to carry out the industrial restructuring focusing on the functional transformation, the establishment of Art and Design Park, the Industrial Design Park and the Cultural Industry Park etc. (Wuxi Government Gazette)

A Forum on Industrial Heritage Conservation jointly sponsored by ICOMOS China, the Chinese State Administration of Cultural Heritage and Jiangsu Provincial Administration of Cultural Heritage was held on April 18th 2006 in Wuxi. In this forum, 'Suggestions on the Reservation of China's Industrial Heritage' was produced, which is the first time at home to put forwards the definition of industrial heritage, the present threats industrial heritage faces and the approaches of its protection.

Still, problems exist in the practice of the industrial heritage's protection in Wuxi. The typical example is Beicangmen Culture and Art Center.

Beicangmen, located beside the Grand Canal, built in 1938, was the largest Silk Warehouse around Jiangsu, Zhejiang and Anhui province. Two brother and sister Zheng Haoming and Zheng Haohua who returned home from abroad, found this idle silk warehouse. They tried their best to protect it from dismantling and invested in building an art center, quite similar as the foundation of Shanghai art studios beside Suzhou Creek[4]. In Shanghai, most old factories and warehouses along Suzhou Creek were originally set be demolished in favour of the construction of modern high-rise buildings, aiming at a social and economic regeneration of the Suzhou Creek area. However, following initiatives of artists in the late 1990s the riverside has been designated as a protected heritage zone and many warehouses have been conserved, now providing quarters for Shanghai's flourishing art scene. (Wikipedia)

In Sept. 2005, the rebirth of the old mill, the so-called 'Beicangmen Phenomenon', shocked the city who had been busy working on the economic development purely for many years. Painting exhibition space, cafes, and bars with the post-modern style in the center were full of the nostalgic atmosphere.

However the center's sustainable development lives in difficult circumstances, and it can even hardly maintain. Unlike Shanghai, Wuxi's innovative industry is in the embryonic stage and the market hasn't been exploited yet. What's more, Beicangmen's Shanghai style is a little bit far from Wuxi ordinary people's life and far beyond their reality. The public haven't prepared very well to accept or realize this change's value. (Wang. 2007, 297-298)

It is worth noting that, the present Beicangmen Culture and Art Center has partly lost its characteristics as a silk warehouse except the architecture itself. The similar story happened in '798' Art Zone[5] as well. 798's spontaneous rise promoted the practice of the industrial heritage's preservation in Beijing. However, what is "798" lacking in? Wang Chuncheng, the director of Heritage assembly of the Capital Museum gave his answer-the workers' and industrial memory associated with the original context. (Lifeweek)

To sum up, we believe one of the urgent things we should do now is to educate or remind people of the value of the disappearing industrial memory in a more local and diversified way and industrial design could be a bridge filling the gap. For example, the commodity design with the traces of the special local industrial memory, which will enter people's life little by little and arouse

[4] Suzhou Creek (whose original name was Wusong River) is considered as Shanghai's mother river, which nourished Shanghai's prosperity in the early years of the last century.

[5] '798' Art Zone is a part of Dashanzi in the Chaoyang District in Beijing that houses a thriving artist community, among 50-year old decommissioned military factory buildings of unique architectural style.

their sympathy. The way paying close attention to people's everyday life may generate the unimaginable power for the industrial culture's preservation and communication. In the mean time, in regard of the topics of sustainable design and localization design, industrial memory is undoubtedly the priceless treasure inspiring designers or artists with passion for innovation.

3. Warm Realism

Our project started with Wuxi Kaiyuan Machine Tools Mill in November last year.

Wuxi Kaiyuan Machine Tools Mill, today's Wuxi Kaiyuan Machine Tools Group Co., LTD, a large-sized backbone enterprise of the machinery industry in China, was founded by a famous industrialist Mr. Rong Desheng in 1948. Rong's family had been one of the most influential business groups in China since the beginning of the last century and Rong Desheng was one of China's richest persons and well-known entrepreneurs.

The businessmen like Rong's family in the times are regarded as the representatives of Confucian Traders. Confucianism traders mean have high artistic appreciation relatively, have the Confucianists moral concept and value orientation, have and make unremitting efforts to improve oneself and dare the entrepreneur of the initiative spirit. The more modern by" trader of Confucianism spirit" is profit "must at society, use in by society". (Chinese Confucius Institute)

In history, Confucian Traders looked upon the market as a hub, as an opportunity to integrate resources to seek for the common ground and internal relations between the nation, people's livelihood, markets and enterprises and shape brands relying on their unique commercial spirits and value systems. Moreover, it is more attractive that Confucian Traders advocate Confucianism and Taoism culture in pursuit of the strong sentiments of the humanities. (The State Council Research Center of The State-owned Assets Supervision and Administration Commission) The culture of the Confucian Traders influenced the industrial culture deeply. A very small detail can embody this culture's imprint: the sign 'Happily go to work, return home safely' can be found easily in the factories in China which actually suggests the close relationship between home and factory, whereas as a unique virtue ethics, Confucian ethics firstly started with the family. (Fig. 1)

Sixty years have passed. The mill experienced rise and fall but still in good condition and in operation. However, change will take place one year later at last. In line with the relevant policy, the old factories are set be demolished and moved to the industrial park located in the suburb in favour of the urban development. Most of the land of the mill has been sold to a real estate company giving way to a modern apartment complex. We feel anxious the objects and scenes with the traces of the common workers' everyday life that moved us deeply will lose inevitably to a large extent even though Wuxi municipal government has planned to keep the earliest workshop buildings through functional transformation and later reusing. Our aim of this project is to use the medium of design to keep the stories of the workers and the mill's original culture from disappearing. The project focusing on the subtle life may extend personal works to stimulate people's imagination. It introduces new ideas to deal with old problems, quite different from the customary architectural or literal preservation.

Besides the mill, the investigation also involves in visiting some old workers' houses, finding out their life at home and listening to their telling stories. Factory workers are the people whose fate has changed the most drastically of anyone in China in the past decades, whereas most of them usually serve for one enterprise loyally in their whole career lives and have plain and profound feelings with her. Industrial culture affected the life of the countless workers and their family, even other fields such as literature, art etc. in different times.

'Warm Realism' is quoted from an interview with a Chinese director Jia Zhangke, whose film '24 City' tells a story about three women in the 50s, the 70s, and the present day, as society makes the transition from collectivism to individualism. We choose it as the interpretation of the industrial memories since the memory of the past life in old factories always brings people back to a warm dream. Realism in the visual arts and literature is the depiction of subjects as they

appear in everyday life, without embellishment or interpretation, which is the starting point of our design innovation.

4. Rubbings

There is no civilization that has relied as much as the Chinese on carving inscriptions into stone as a way of preserving the memory of its history and culture. By the beginning of the seventh century, or perhaps much earlier, the Chinese had found a method of making multiple copies of old inscribed records, using paper and ink. A rubbing, by accurately reproducing every line of the inscription in a white impression on black ground, provides a sharper and more readable image than the original inscription or a photograph of the original. Rubbings (also known as inked squeezes) in effect “print” the inscription, making precise copies that can be carried away and distributed in considerable numbers. (East Asian Library, University of California, Berkeley)

We assimilate or analogize the value of rubbings. From our point of view, a rubbing is a communicator connecting the past and the present, a vehicle for showing the past culture and a new form of life with the past traces. So we pile up the first-hand materials, exploit new ways to narrate the past, present, upcoming and imaginable stories through experimental videos and design works, expressing the emotions such as recalling, commemorating, reviving, and hoping etc. and sharing with more other people. The project not only reveals the long history of the factory, the cool scenes with the special aesthetics, but the insignificant reflecting workers’ life, and consequently the memories could be continued and revived through different media.

Rubbings could be a transdisciplinary platform on which designers can tell their stories through images, videos, products, installations or other graphic works etc. Below is a summary of several possible elements for us to develop diverse ideas.

A. Fiber, dry wall, awning, broken windows…
B. Natural sunlight & electric lamps
   These elements are related to architecture. The fiber features the introduction of natural light, while at night the workshops are cast a pale yellow and warm color because of the electric lamps.
C. Greasy dirt, dust, rust, chipping, welding marks…
   These all are different textures, the footprint of time.
D. Industrial color & everyday life color
   The color of the Industrial culture is exceptional: the relatively high saturate degree and a strong contrast, which affects the color of the workers’ articles of everyday use in workshops.
E. Machine Tools, old moulds, parts…
F. Furniture: Stools, chairs, tables, and lamps…
G. Articles of everyday use: Thermoses, mugs, fanners, glasses, shoes and clothes…(Fig. 2)
   You would have a very special feeling, especially these things were found in a different state of existence in workshops. (Fig. 3)
H. Grass, trees…
   Nature is always a faithful witness of history.

Except the elements related to the buildings, such as fiber, dry wall etc., or trees, commemorative equipments, many of elements the above mentioned can hardly be seen again once the old workshops are rehabilitated, especially broken windows which will be repaired; greasy dirt, dust, rust and chipping which will be wiped off or painted again; stools, chairs, tables, and lamps which will be replaced. Surely nothing will be left if the buildings are demolished.

Whereas it is the insignificant, often being overlooked, that triggers our passion. We regard them as a huge source of inspiration. The conceptual design proposals below have something in common: small stories mirroring the broad background and deep reflection . Each proposal is a process of investigation, an interface between the industrial culture and far-ranging people.

A. ‘Renrenyouze’

Three students, Yushan Wang, Yanfei Xu and Yupeng Gao’s video narrates the story of a little mouse ‘visiting’ the mill. Thus most of the frames are recorded from the upward angle of view, representing the mill’s state during her final period of time with a joyful fast-moving camera.

Another group, including four junior students Yimai Guan, Xianyin Li, Xingyu Zhang and Mingnan Wen focuses on the characters, scrawls or graffiti which can be found everywhere in the workshops, especially the slogan ‘Renrenyouze’ which means everyone has a share of responsibility, reflecting the far-reaching cultural and historical context. Both groups’ works contain the true details and scenes, their own emotions and imaginations as well.

B. A branch on the wall

Nature witnesses the change of the mill silently. A senior student Ma Xinxin noticed a branch propped against a wall of a plant building, and the almost disconnected twig drew a circle back and forth like a swinging pendulum, leaving the imprint on the wall. She recorded the twig’s move from winter through to spring and the process of its growing leaves gradually. The story is the base of her creation. She made a video and a set of products including a table, a clock and a diary. Her works all connect with time and suggest vicissitudes of life.

C. Rubbings

In addition to the videos, postcard or bookmark design is another easy way to show things familiar to the workers, however probably strange to other people.

During the investigation, we were surprised to find the different handmade furniture in a small-sized hardware machining workshop. It was the intelligent workers who made use of wood and steel in the mill making tables, chairs and stools, some of which are elegant, some are simple, and others are clever even full of humor. Time left wrinkles in wood chairs and lacquer flakes on steel stools. Our concept is very simple: magnifying these beautiful wrinkles and flakes in order to trigger people’s imagination to the past. This proposal developed from our desire to create the beauty of the insignificant.

Concerning the materials of the postcard or bookmark, we plan to choose the rice paper, whose character is strong and wearable enough. Furthermore, the traditional paper, integrating the modern printing technology, suggests the culture of the Chinese Confucian Traders and echoes the theme ‘Rubbings’ as well.

5. Conclusion

History has always been shaped not by reality alone but by imagination. The title *Rubbings* on the one hand suggests we respect reality, on the other, a rubbing is another form of relatively independent art with warm memories and dreams.

This project set out to develop a design approach for producing conceptual works that encourage meaningful reflection on the preservation of the industrial memories in Wuxi, a city of rapid change and advancement. This approach provides a multidisciplinary platform for designers and artists to show their respect for history, innovative capability for promoting people’s everyday life and the imagination for the future. We hope our research can achieve the goal, which is communicating the industrial heritage culture to the public and integrating sustainable design with localization design.

Industrial heritage is a special language of a city as well as a kind of special historic memory. We may not be able to preserve everything but what we can do is to raise awareness, introduce new ideas and ensure that the culture they represent survives into the future. Not only as a matter of respect for the memories of the older generation, but also as part of our debt to history and the historical record for generations to come. (Huang 2007, 157-165)

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Fig. 1: Return Home Safely.

Fig. 2: A corner in a workshop. There is a purple sand cup on the table covered with an enamel lid. The left side is a real estate newspaper.

Fig. 3: A handmade chair wearing clothes. A female worker slipped her pink sweater on the back of a chair.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

“DEMOLISH” AND “CONSTRUCTION”

A Research on transition of urban communities and sustainable lifestyle in China

Xiaojiang Zhou[1] and Xing Liu [2]

Abstract

In the last 20 years, China has been in the radical change of urbanization. The cities have been growing fast through continual construction and demolition.

This research focuses on the development of several cities in Southern Yangtze of China to investigate the change of the residents in their lifestyle, living attitude during the “demolition’’ and ‘construction’ in the perspective of urban plan and environmental design. Through the experiments of design projects in urban plan and environmental design, solutions would be found for those disharmony problems occurred during the transition process of ‘demolition’ and ‘construction’. The proposals, from both the tangible and intangible points of view, would be developed for the development of the cities and regroup of residents, as well as the reconstruction of new communities with extension of traditional customs.

Keyword: Demolition, Construction, Urban Environment, Community, Lifestyle, Living attitude, Sustainability

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Since the late 1970s, China implemented the open policy and the introduction of private economy, the Chinese economy has entered a sustained, rapid period of development, and this period is also the most rapid process of China's urbanization. At present, China's urbanization level has reached more than 35%. The demand of economic development, the rapid expansion of the urban population, the change of transportation mode, the implementation of engineering project for people etc. led to the rapid expansion of Chinese cities through continuous “demolition" and "reconstruction". The old community "are not suited" to the needs of the development and are removed and replaced with wide roads, modernized squares, high-level residential or commercial facilities. It seems simple in appearance but this process is a city member change through which the original residents have to move to the extension part of the city while the new gentry and immigrants come to occupy the center of the cities.

“Demolish” and “Construction” in the cities

One city changes after another, such changes also bring about a risk of the break of the original historical context of the cities. During the process of transformation of old urban areas, a lot of cities has adopted the approach of demolition in large scale and re-build the whole land without division of ‘good’ or ‘bad’ in their detailed work. The so-called "one year a kind, three years a big transformation" is a typical motto for the reconstruction work of many cities in the 1990s construction. Then there came out some examples of destructive construction for the economic interests or the need to highlight political achievements for local government.

Taking an example of the coast of Wulinmen canal, the original city is constructed along the bank of the river, with streets for land traffic in front of the buildings and the canal for water traffic behind the buildings. The living environment manifests the characteristics of south Yangtze River culture. Canals are a main transport and rivers are essential in life. People's daily life and production activities are all around the canal. But now along the coast of the canal, we could never find the original community construction. The canal has degraded as a decoration of the environment and original constructions are replaced by high buildings. Speedboat has eliminated those wood boats. Modernization has put the history far behind. Although the urban constructors want to preserve some historical marks, these symbols have already been squeezed in the flow of the city development. (Figure1) There was a hot time that the whole nation was fond of building new Modern Square in front of the municipal government gate. For the ancient city of Shaoxing in the "Square hot" period, all the old lanes, aged streets and residents of the center of the city are demolished totally. In stead, all around, tall building stands in great numbers. It’s difficult to find the trail of graceful historical culture.

However, due to historical, social, economic, technological, and other comprehensive factors and the impact of constraints, the old cities left by different times are not suited in some degree for people’s current life needs. The original functions and personalities are declining in some old cities. In some old residential areas there exist serious problems of backward facilities, poor environment, economic depression, increasing social problems etc., such a phenomenon tends to give people an error in the understanding of the old city: They thought that ‘the old community’ was a “mess” left by the past, and was a “burden” of the city and a representative of "dirty, disorder and poor conditions,”. In order to change this impression, by the promotion of the powerful commercial interests and the need for the development, updating, renovation and construction of a city's image will certainly become a main subject of the development.

“Demolish” and “Construction” and the changes of the lifestyle and life concept of the urban residents

The urban changes of “demolition” and “reconstruction” occurred not only in the urban landscape, the culture contest and the characteristics. More importantly, this ‘demolition’ and ‘reconstruction’ has brought tremendous changes to the lifestyle and life concept of the residents

who moved to the periphery of the city. This change reflects in the changes of living conditions, of the reorganization of the community residents, changes in the material conditions of life, and of the distance between city centre and traffic changes, and so on.

The living environment changes

These changes can be seen after the changes of living environment. In the past, the relatively traditional and compact living space brings inconvenience in life; however, it brings also the convenience for family communication. In the past traditional residential, a big family usually live together. We can see or feel the other members' activities or we fulfill one commission by division and coordination. Living in such community, it's convenient to communicate with other families. Original community is relatively open between families and the living environment and space provides opportunity for exchange between them. In this atmosphere, a single family can easily integrate into the community. Now the new residential are mostly high-rise buildings. The family inner space has increased greatly. We can say it's a big improvement in the respect of comfort. However, it could result in less communication between family members and some families have to be divided into several small families. At the same time, because of the division of independent unit and the lack of public activity space, the communication between families has been reduced. Even if one family member is keen on community activities, it'll be rare to see a whole family participation.

Changes of reorganization of the community residents

This change is also reflected in the reorganization of community residents. People living in the original same community have common understanding and know each other's habits because of a long period of coexistence. Therefore, they have a lot in common in their life style and are able to find better way of living together. The relocation of community residents will inevitably bring about the restructuring of residents. Large number of indigenous people moved out, (often retained original household affiliation), which destroyed the original social network, disintegration of community awareness, and led to the confusion of social order and disorder of individual behavior.

Although the reorganized communities have property management agencies and neighborhood committees, in China these organizations or institutions only play a role of coordination and regulation in the disputes or vote on those affaires related to the whole community residents. In other words, their role is passive; so far very few of these organizations can actively work for the community integration and the construction of community culture. It's because of the rapid development of China's new communities and the result of the fact that the society has given the preparatory work to the real estate developers in recent years. At present, the mutual communication in the community has followed the traditional way – people get to understand each other in their daily life. On the one hand, this way cannot be developed after new residential style; On the other hand, this kind of mutual understanding could only be achieved after a long time, which will bring about lots of problems for initial community construction, such as issues of assistance, disturbance, the feeling of belonging and sense of honor etc. (Figure2)

The effect of improvement of material conditions

These changes are also reflected in the improvement of material conditions. In order to implement smoothly the urban construction, the government gives economic or material compensation to the residents who have to move to the urban periphery. Such compensation with people's material wealth by the economic development lead to changes in the concept of happy life which in the past it was usually a wealthy life. While enjoying the material wealth, people come to pursue other things such as 'quality of life', 'happy connotation' etc. New communities may have some facilities, but in general not perfect enough or just facilities without services because of the immature market. Compared with the original residential in the city center, this economic improvement hasn't brought the improvement of 'quality of life' for moved people.

Changes of the distance from the city center and traffic changes

Changes are also reflected in the transport inconvenience caused by the big distance between residential and center of the city. Accustomed to living in the city center, the residents feel some loss once relocated. This is not only because of inadequate facilities matched for the new community far away from the city center, but also because these residents will have the feeling of being bordered by changes of inhabited area and they will think that they have become marginalized people of the city. It is the result of differences between urban and rural areas as well as the dominant position of the urban area. In order to compensate for this difference, some people purchase cars to reduce the distance from the city center, but, more and more automobiles has caused traffic problems and it starts a vicious cycle.

The sustainable development of urban community

"Demolition'' is the development need and it has broken the original balanced system; while "construction" is to establish one kind of new balanced system. During this process, 'construction', 'adaptation' and 'new balance' have constituted a new melody for China's current urbanization. On this circumstance, "demolition" is inevitable, then how to "reconstruct" is a current priority.

As a social organism, cities have to face a process of the metabolism, sustained changes. The key is a progressive improvement of living environment and maintaining the quality of vitality of old and new community alternation. At the same time, they have to "maintain the neighborhoods structure", "keep the traditional characteristics", "protect the diversity of urban life ","coordinate overall of urban space "and other sustainable development goals. A city's 'demolition' and 'reconstruction' development should be considered in two aspects: on one hand it's the issue of culture continuity and life style evolution by 'demolition' of original buildings and communities; on the other hand, how the construction of new community could keep their original lifestyle and life concept while adapting new development demands become important.

Thoughts of reconstruction of the original 'demolition' areas

The first problem is related to reservation or eliminations of urban culture renewal and urban characteristics. It's more likely considered on the form. As mentioned earlier, most of the new residents are those new gentry and elites from the outside of the city and they do not have deep understanding about the city connotation. It's not possible for them able to take the responsibility to prolong the city culture. To some extent, they have already become masters of the city and they will construct a new city connotation by their own mode. If they can retain some symbols of the original city (even on the surface), it's already a good result. (Perhaps there exist some strong utilitarian purposes.)

A relatively successful example in the urban transformation is the project of the Nanjing Confucian Temple area. Since the Eastern Jin Dynasty, the "Confucian Temple" has been the center of cultural exchanges, and a center of the merchants movement, known as" ten mile of Qin Huai ", which is the birthplace and the historical testimony of ancient capital of Nanjing. Time brings great changes to the world. Before liberation, the "ten miles Qin Huai" was once dilapidated and in deserted depression. Since 1984, Nanjing restored the "Confucian Temple", rehabilitated the East and West market, the learning Palace, examination hall and other ancient buildings. Although there are differences with the original construction, the rehabilitation was done in the absence of protection of ancient sites. The cultural advantages of Confucius Temple, examination hall, the scenery of Qinhuai River and of the traditional Lantern Festival characteristics have restored the traditional features pattern and the vitality of old community. It has effectively promoted the development of the city's historical, cultural continuity and the revitalization of the local economy, so that the old community areas have obtained the sustainable development.

From these words, we can clearly feel the proud and the sense of achievement of the city dominant. They are proud of their own "masterpiece" and at the same time, have forgotten the fundamental reason for the rise, forgotten the psychological feelings of those indigenous residents who were moved to different places. If we compare the transformed Confucian Temple

and the original "Ten mile Qin Huai", we can discover their purpose for quick success - all around the commercial development, the so-called culture is only a layer of "skin", an object which controlled by the dominants. Therefore, I'll not discuss too much here.

The sustainable life style of the indigenous residents

The main body of the second aspect is the indigenous inhabitants. They have special feelings for the city they lived. The changes of the city affect not only their life style but also their life concept. They are the real successors of the original city's connotation. However, they have to face these changes and to adapt to these changes, they're trying to retain their own existing way of life and life concept, and at the same they're adjusting themselves as well. So in addition to the help with the basic system and major infrastructure construction, we should do research in the following aspects:

1, In the design and construction of new community, what should be taken into account is that the real needs of inhabitants' original way of life, so that their original lifestyle could be extended. This kind of needs include basic need for living, health need, education need, exchange need, entertainment need and ceremonies need etc. This requires a deep investigation on the new residents who have the plan to move into the new community and thus carry on the integration. As showed in the picture, the Hangzhou government is establishing a file of a new community of relocated residents. The first floor is to be stilted to the bottom of the upper floor, which provides the public active space for the residents, especially practical for traditional family ceremony such as traditional family wedding banquet, traditional memorial ceremony etc. at the same time, there'll be an open style activity room on the first floor, just like the "courtyard" of the original residential, to provide a space for people's gathering. The children who come home after school can be taken care of for free if their parents are not off work. More importantly, this space will become the core of the building. Through this "courtyard", many families are able to carry out the activities which they can not do in their own house. The conflict of the original life style and the modern life style may obtain a buffer a in the residential house can not carried out by the "yard" the original way of life and lifestyle of the modern conflict can be a buffer. (Figure3)

2, To establish a platform of communication, so that the residents of new community can be integrated into a new environment as soon as possible. As the new community has transformed from the plane housing to the three-dimensional housing, which has brought certain limit for the face-to-face communication. Community platform can be direct, and it can also be a virtual network platform by modern technology. Direct exchange platform can give more mutual communication chances to the community residents through the themed activities. Based on the needs of original way of life, the platform can provide a free space for the residents' communication. In short, the direct exchange platform enables the residents to go out of their honeycomb-like housing, to return to the residential community. The virtual exchange platform can be established by network. Through the virtual platform people can be overcome the awkward and the psychological closer problem to be able to communicate with the unfamiliar neighbors. Modern technology and material conditions can provide reliable protection for the realization of virtual platform. This kind of work is being carried out. The key is how the network service could be accepted by ordinary residents. On the one hand, it can be achieved by development of products easy to be operated; on the other hand, it can be promoted by topic activities about the review of original life style.

3, Promotion of community service system, to create a sense of belonging to the new community residents. The original community has formed relatively perfect service system along with the time accumulation. Whether on the emotion or from the habit, the newly moved-in residents from the original community will have no doubt some feeling of not adapted at the beginning. This feeling is manifested in the memory of the original living environment, and the complaints for the new environment. A more human design with the help of the original service system is required to provide the residents a sense of "home", to help them find their own feeling of belonging.

Ideal model of community

Therefore, we can conceive this kind of community: in such a community, when people moved in from the old community, along with their complaints and confusion, they will be surprised to find that in this community, they can clearly identify their original community shadow, although there’re some changes in the form, this doesn’t change too much their habits. They can find the appropriate facilities to their needs, and even better than before. Living in the new community, people find some new faces in neighbors, and there’re some differences in their living habits. However, they discover that they have similar experiences in many aspects through the themed activities. Then gradually, the neighborhood relationship becomes intimate. At leisure, they could also try to know new neighbors through the community platform. Through constant exchanges and communication, they become friends and this promotes also exchanges and communication between the family members. When somebody needs help, they could offer their help. When coordination is needed, they can gather as quickly as possible. They are no longer isolated and helpless, and they began to integrate into the new organism. Community support and services are not worse than their original community. Although it’s far from the city centre, they can have everything they want. They began to approve this living environment, and also enjoy fun of a new life. The new community makes them no longer have the original feeling of "the allocation". More importantly, as a result of the improvement of material conditions and habitable space, they begin to have more experience and strength to engage in things that they wanted to do initially but haven’t realized. They feel that their dreams are not far from them, and they feel real happiness.

China’s development and changes of cities have brought unprecedented impact on the life style and life concept which have continued for thousands of years. This kind of impact has urged us to find a way suited for our development while changing our original way of life. Change is inevitable, and the key point is to maintain our own characteristics during the changes.

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Fig. 1: Comparing the environment along the coast of Wulinmen canal in Hangzhou

Fig. 2: The traditional way of the community life

Fig. 3: The new public active space for the residents------“courtyard”

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Urban Memory Responds to the Change[1]

Improvement and Revitalization of Public Spaces in Macao's Historical Corridor

ZHU Rong[1], Francisco Vizeu Pinheiro[2]

Abstract

Each city has memory elements. However, some deep changes in the city, a consequence of modernization in the global scale, are negative because they erase layers of history and tradition.

Taking Macao's Historical Corridor as a case study, this paper investigates the historical context of the city and makes a SWOT analysis of key parts of Macao's Historical Center. This method of revitalization addresses issues like public transportation, historical preservation, commercial viability, and cultural tourism.

The conclusion respects the historical character and contributes to reinforcing the traditional meaning and sense of the place. This paper also presents strategies and principles to improve and revitalize public spaces located in dilapidated or misused historical centres that contribute in a holistic way to retrieving the unity and ambience that were lost, thus promoting heritage sustainability. Finally, the new systematic approaches for preserving the continuity and cultural identity of the city are especially highlighted by means of a multi-disciplinary participation in the urban planning process.

Key words: Urban memory, Public Space, Historical Corridor, Macao's Heritage

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1. Introduction

As an important human mental activity in psychology, memory appears to be a dynamic and interactive "art"[2], located between the internal virtual consciousness and the external real world. In a broader aspect of social and cultural contexts, the collective memory contributes to the formation and maintenance of cultural identity and collective coherence in a group or community.[3]

Each city has memory elements. Urban memory helps to maintain urban continuity and integrity, to construct urban spirit and soul. As the mnemonic codes to recall history, place and architecture always have a close relationship with urban memory. Memory is one of the crucial factors influencing the creation of architecture and city places. Simultaneously, it is the existence of urban memory that restricts the evolution of urban structures and social culture. City structures such as urban fabrics, streets and monuments contribute to inscribing and preserving historical events, linking social life to spatial structures for recollections and references of latter ages. They not only provide the living spaces, but also allow habitants for direct living experience and value conception. According to Ruskin, the important role of urban architecture in the psychological and sociological aspect could be that, "We may live without [Architecture], and worship without her, but we cannot remember without her."[4]

2. Urban memory in the change

In the recent decades, most Chinese cities have witnessed the huge process of change caused by urbanization and globalization trends. Unprecedented prosperity and opportunities were anticipated in the field of economic growth and urban development.

However, in the urban renewal, considerable risks and pressures brought about by these big changes could not be neglected. The high speed of new urban constructions and the prevalent influence of market-oriented developers in the city planning are erasing layers of history, disrupting the traditional urban continuity and unity. The fragmentation trend of the old city fabric seems unavoidable. Individual historical buildings are more and more separated and surrounded by many modern high-rise buildings. Some historical public spaces had abandoned their traditional functions, and degenerated into uncharacteristic spaces or adapted as parking lots that serve only practical logistic functions. But while, one of the problems which come up with more intensity is the issue of the "social amnesia". The changeable urban physical form destroys the familiar narrative circumstances for residents, threats and distorts urban memory. Urban memory is on the brink of extinction, resulting in cultural homogeneity and identity crisis. Therefore, how to protect culture, continue urban history and sustain social identity in the change have come to be the urgent tasks and research objects of urban sustainable development nowadays.

As the core part of urban fabric, urban public spaces in the urban historical center take unique historical and social roles in recording history, preserving collective memory and cultural identity. Although never visually presented to be in existence as physical structures, they are still regarded as the aggregation of relationship between material carrier and spatial form. Furthermore, urban public spaces are the connection ties and media to continue and regenerate historical memory in the urban historical areas. Therefore, they could be the most effective objects to control the holistic ambience and character of one place in the preservation of urban history and culture.

3. Research experience applied to Macao's historical corridor

3.1 Urban context

L. Mumford, the famous town-planning historian had mention that “the city lives because it has a memory. Thanks to its buildings and to its institutional structures, and thanks to the even more lasting symbolic forms of literature and of art, the city combines the past with present and with the future. Within its historical walls time clashes with time and defies it, because its structures survive the functions and the purposes which determined their creation is the locus of the collective memory”[5]. Macao is that kind of city which has considerable historical depth as an urban environment. Several layers of time overlapped to reveal how history, present, the future fused into this city. As the melting pot of Chinese and Western cultures, Macao city owns the special historical background and culture character. Its particularity and distinction are especially represented in the Historical Center of Macao (HCM), which was enlisted by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as part of World Heritage on 15 July 2005. Whereas, as a consequence of the rapid growth in estate development, population and tourism economy, some areas still inevitably confronted with tremendous pressures. For the HCM’s survival, scholars have established the concept of defining a thin and long Historical Corridor, starting in the riverside Chinese temple of A-Ma to the Hills of the Portuguese Monte Fort, linking many Portuguese and Chinese monuments and historical spaces of the city.

Aim to make improvement and revitalization for dilapidated and uncharacterized public spaces located in the historical center and to retrieve its unity and continuity, in the last two years selected squares and streets in two sites of the HCM were investigated and researched by the Department of Architecture and Environmental Design, School of Design, Jiangnan University in collaboration with the Civic and Municipal affaires Bureau (IACM), the Institute For Tourism Studies (IFT), University of Macao (UMAC), and Inter University Institute of Macao (IIUM).

3.2. Case studies from two MHC’s sites analysis

Strongly contrasting with the commercial feature, “sustainability’ of (northern part) corridor linking the Senate Square to S. Paul Ruins (approximately one kilometer long), is the ambience in the second half (Senate to Ama temple Square) where most of buildings in the circuit are contemporary ones of uncharacteristic qualities originated by poor design. Some old buildings are very dilapidated. A few bright spots like St Augustine, Lilau and Ama Squares are the exception. The stretch linking Senate Square by way of Calcada do Tronco is very steep, polluted, and narrow, surrounded by un-descriptive ugly modern buildings. Two sites in the MHC were chosen for analysis.

3. 2. 1. Site 1-- Area linking Senate and St. Augustine Squares

The approach to the revitalization of the 2-kilometer long stretch of MHC’s was made step-by-step, in this case stretch-by-stretch. Two areas were chosen; the first is the one linking the Senate to St. Augustine Squares. In this short zone exist several green spaces and historical buildings such as Senate Square, Sir Robert Ho Tong Library, Dom Pedro V Theatre, St. Joseph Church & Seminary, and St. Augustine Church. The access to this site is problematic because of the steep and polluted road without place for shelter or refreshment.

3.2.2. Site 2-- Lilau Square

The second site corresponds to the area near the Lilau Square. It is one of the more traditional Portuguese spaces, very near a large Chinese mansion and a popular site knows as the old Lady fountain in Chinese.

Other major problem of this place is the large of empty buildings that received the nickname of “Ghost houses”, a title not very conducive to World Heritage status. These empty houses form more than 80% of the square facades. Until now renovation actions were painting the walls,

changing the pavement in the square and building square flower bases for the old trees. Only the large mandarin house, property of the government, is being fully remodeled. The historical Chinese and Western buildings and the real Lilau fountain site live divorced from each other. The mandarin mansion building is being restored and will open to the public before 2010. At the western end of this mansion, there is a road bottleneck without space for sidewalks but only dimension for one car passing, constituting a dangerous situation for tourists.

The Name of the place comes from the old Lilau fountain. However, the memory of this fountain is nearly lost when in 1995 was built a new one with a minimalist approach design. Geometry and minimalist are often in the opposite spectrum of a design based on memory, local culture and tradition. The “minimalist fountain” that looks like a wall and often wets the square ground, is disliked by local population and visitors, which often uses its back site as a toilet. The real fountain, the one that generated the legend of “The one who drinks from Lilau will return to Macau” is abandoned and forgotten in a nearby place.

3. 2. 3. Main problems of the sites in the southern corridor

Through SWOT analysis, the main issues of this southern corridor were found to be as follows: **1) Heavy traffic and noise pollution.** This route is occupied by heavy traffic of motors and cars, which cause terrible noise and pollution; **2) Poor accessibility and safety for pedestrians**. The narrowness and the ups and downs of the streets are very hard for pedestrians to traverse. In areas like the one near Chang Mandarin, the corridor is so narrow that either cars or persons can pass at one time; **3) Uncharacteristic public spaces and streetscapes.** Abundance of uncharacteristic contemporary constructions, mostly residence or commercial buildings are very poor and lack character, hiding in a forest of cement destroying the heritage value, ambience and spirit of this historical street; **4) Lack of shelters** for protection of the often-inclement local wheatear in raining seasons; **5) Lack of support services** necessary in the long corridor, like places for resting, tourism information sites, coffeehouse, toilets, etc. Considering that this stretch is 1 Km long, this is a serious hindrance, a bad experience for tourists; **6) Confusion and difficulty to navigate in the historical corridor**. Due to the lack of historical and visual contact references, tourists are often lost in this area; **7) Non-placeness.** Due to the limited information of site history and social stories, some famous historical buildings such as Dak Seng Pawnshop, or lanes such as the Happiness Street are less known. Contrasted with the site from Senate Square to S. Paul Ruins, social, commercial and tourism activities for the neighborhood are not so prosperous; **8) Lack of proper urban furniture and lighting**. Urban furniture is lacking or designed to be the inappropriate one in historical places, like large trashcan containers in historical squares or near historical buildings. Parts of this corridor are not well light. For example, the Ama Temple Square is dark by night.

4. Propose rehabilitation strategies

4.1. Strategies for site 1--Senate to St. Augustine Square

In meeting challenges of improvement and revitalization of these research areas, the initial focus is on improvement and revitalization centered on urban memory and culture identity for residents and tourists. It was avoided to solve urban problems by applying contemporary geometric compositions and materials that are not linked with the history, vernacular, and classic tradition of the place. Therefore, the solutions present a practical approach that are applied for solving issues of historic preservation, urban transportation, commercial viability, and cultural tourism. Based on the analysis of physical and social issues, four strategies were suggested by way of a sustainable, phased re-development. The proposed strategies are: **1) Pedestrianization of the district.** The existing main road should be adapted for pedestrian use

after routing major traffic around the whole district instead of going through its narrow roads. Public and private transportation should be restricted to a minimum, helping to create a less polluted environment. Electric buses could be used for shuttle services in the historic corridor. The car-free environment helps to conserve and enhance the more traditional and distinctive streets that link up existing monuments forming a heritage trail. The pedestrian circuit should not be limited to one linear experience but enriched by several options providing a more compressive understanding of the urban fabric and local architecture. Through interviews of various groups, the other alternative route is put forward from Senate Square to St. Augustine Church; **2) Promotion of urban memory by a balanced urban development.** Construction guidelines are necessary for creating a balanced urban development so as to maintain urban memory and culture identity as a major place for citizens and tourists. This approach includes revitalizing Happiness Street[6] by emphasizing spatial nodes, public facilities, protection roof, facade element (Fig.1); reconnecting the corridor with more cultural attractions such as the Tak Seng On Pawnshop[7]; attracting tourists from the north part of the Corridor (Senate Square-S. Paul Ruins) to the south part (Senate Square-Ama Temple). At the same time, commercial vitality and cultural tourism could be enhanced with the reintroduction of the traditional custom and hand-making snacks and foods; **3) Adaptive reuse of dilapidated buildings**. Selectively rebuilding some buildings for cultural and historic use will highlight the "memory venue" in circulation. In site 1, several buildings are dilapidated and empty; others are even collapsed in this part of the historical city. To bring back life to this area, some of the un-characteristics buildings could be adapted as for supporting cultural and heritage activities as well for improving the streetscape of this "unclassified" area that is nevertheless an important link between the Chinatown and the western St. Augustine Square. A new museum (Fig. 2) will help to create a local landmark in this district, contributing for memory preservation and cultural identity reinforcement in this area. It can also hold civic cultural activities and provide information to visitors and tourists from the region. The design of this new museum is based on the decorative vernacular patterns of the buildings in the neighborhood, apparent in the hexagonal windows shutters framework supporting mother-of-pearl screens, timber hinged door panels and sliding gates, roof gable, blue bricks plastered in different color layers, etc; **4) Revitalization of residual void open spaces.** To collect and fill in residual voids of this district, revitalize them into temporary and changeable open spaces which could be used by local residences and tourists. These open spaces are expected to be multifunctional and involve exhibition, entertainment, relaxation. They not only serve as supporting facilities and services, but also play an important role of flexible and motivating elements in promoting diversity of everyday activities, and fostering local community sense of place.

4.2. Strategies for site 2--Lilau Square and surroundings

Historical research and a survey to the local community precede the rehabilitation project of this area. Previous surveys in this area by the workshop and IFT research teams focus on the past memories, present use (of the dilapidated areas) and expectations for the future in terms of quality and preservation of the cultural identity. Other Heritage stakeholders like site owner and government managers of public spaces were included in the survey. There are many possible layout solutions for the reuse design of this site. However, the chosen ones should be elaborated in a way respectful of the memory and spirit of the place that is linked with vernacular practices in architecture, urbanism and social and cultural traditions. The strategies proposed to apply on the second site are: **1) Re-adaptation for reuse of the dilapidated buildings** in Lilau Square. The dilapidated yellow mansion could be reused as a boutique hotel. With the cooperation of building owner, a study of hotel adaptation was elaborated by IFT[8] students after a survey to local residents. An automatic parking system could be built behind the house. The boutique hotel can meet a local need for quality spaces or for youth travelers who like to stay near heritage sites; **2)**

New interior layout for dilapidated houses to bridge different external spaces. The white small houses in the square are supposed to be adapted as a hotel. Respecting the existing layout and considering the memory of the place, one practical solution is suggested to link the houses and adapt them to be a restaurant/café serving Macao's typical foods (and complementing the boutique hotel functions) and as a library/bookshop with souvenir/museum where memories related with the Chinese and Portuguese history of this place are easily accessible. In the pavement of these houses, a water path is expected to be created (Fig.3.), providing the link between the real Lilau water source and the fountain in the square; **3) Remove the minimalist wall fountain** (number 3 in fig 3) for a new one, in a better located and less dominant position; **4) Create more shelters and the green areas** by planting trees, for example in the corner area near the fountain wall; **5) Dismantle the illegal metal structures** in the open space near the real Lilau water source and landscape this area; **6) Improve the connections between all present isolated historical buildings** like the Mandarin house, landscape areas and squares, making them an important nucleus of the southern part of MHC's.

5. Conclusion

"City is the locus of the collective memory"[9]. Cities have to provide their habitants with not only a better physical environment that is livable for all, but also a real "spiritual home" that possess memory, belonging and identity.

Urban memory can contribute to regaining lost unity ambience in urban sites. They are venues where the spirit of that place is anchored, containing the cultural identity that is deeply rooted in the community and is stored in the memory of individuals. Urban memory can help to positively change the negative effects brought about by globalization and, although subject to some degree of abstraction, it is an important tool in retrieving and preserving urban traditions, in this way keeping local culture alive.

Using the concept of urban memory, this paper gives the psychological and sociological points of view to find the historical value, practical effect, future destiny of public spaces in the historical center and ultimately tries to explore the improvement principles and revitalization methods for public space located in historical centers that contribute, in a holistic way, to retrieving the historical continuity and promoting heritage sustainability. More particularly, facing with challenges in the globalization changes, this and other examples seem to suggest that urban structures and spaces should be put into a value system closely related with man, society, historical culture, and new systematic approaches for preserving the city continuity and cultural identity. New systematic approaches for keeping urban memory responsive to the change should be expanded by way of integration of more disciplines in the urban planning process.

Fig. 1: Revitalization of Happiness Street by emphasizing spatial nodes and adding awing roof as well urban furniture elaborated from local design patterns

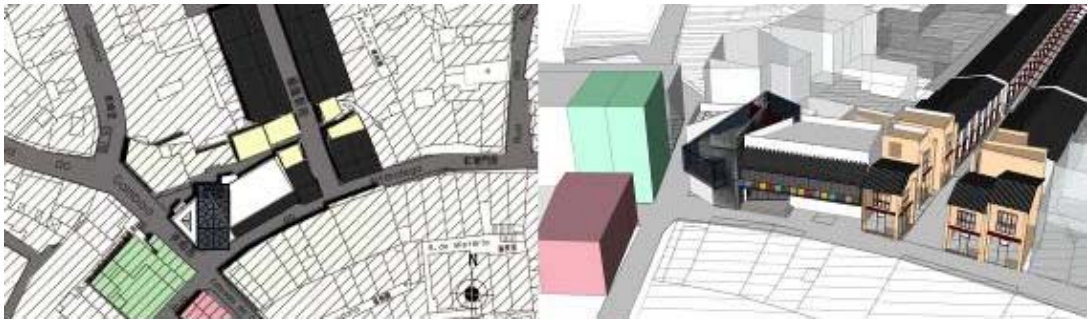

Fig. 2: Selectively rebuilding some buildings for cultural and historic use. A new museum will help to create a local landmark in this district, contributing for memory preservation and cultural identity reinforcement.

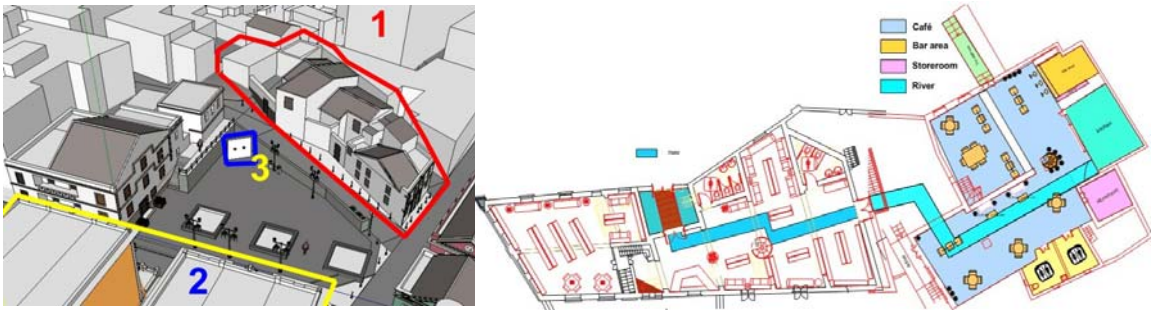

Fig. 3: White houses are proposed to be adapted as a library and café, supporting activities in the square as well complementing the yellow houses (2). The Layout of the white houses (1), with inside water stream linking the real Lilau source with the square.

Notes

[1] Supported by *Jiangsu Social Science Fund Program* (06JSBYS001)

[2] Francis Yates has noted that “The art of memory is an invisible art; it reflects real places but is about, not the places themselves, but the reflection of these with the imagination.” Francis Yates. 1980. Architecture and the art of memory. *Architectural Association Quarterly,* 12: 5.

[3] Maurice Halbwachs, 1992. *On Collective Memory*. Trans. Lewis A. Coser. London: The University of Chicago Press, Ltd.

[4] Ruskin. *The seven lamps of architecture*. New York : Farrar, Straus and Giroux, 1986 reprint of 1849 edition. 169

[5] L. Mumford, 2002. *La città nella storia. Dal Santuario alla polis*. Vol. I, published by Bompiani, Rome. 140

[6] Happiness Street is part of large Chinese quarters of Macau facing the inner Harbour. It is one of the best-preserved lanes that survived intact until our times. This street represents the old gambling center; the entertainment area and the red district that were built by the end of the 19th century. This street is paved with granite slabs revealing the wealth of these quarters. The architecture follows the traditional Qing dynasty practices in the South China region; using brick structural walls for support of the roof and the upper wooden floors. The ground floors were used for commercial purposes and the above level for residence. In this area most of the houses follow the same style, making it difficult to distinguish a shop from a residence. The differences were in the character signs at the gates and in the detailed elaboration of painted frescos over plastered walls. A decorative frieze on the gable walls or written characters on non-structural parts like the crafted timber doors added meaning and intended to attract “luck” and prosperity to the space. Mother-of-pearl is used in windows panels. Gilded crafted screen partitions protected the houses from sunrays and rain.

[7] Established in 1917, the Tak Seng On Pawnshop consists of a pawnshop and a storehouse. Its architectural design and layout, interior decor and equipment would have been very similar to pawnshops in Mainland China at the time. Listed in the Macao Heritage, it is at present the best-preserved pawnshop building in Macau. After its adaptive reuse, the Heritage Exhibition of a Traditional Pawnshop Business was opened in the building, with the Cultural Club next to it.

[8] The study of the yellow and white houses adaptation was done by IFT (Macao’s Institute For Tourism studies)3rd year hotel students under the surveillance of Dr. Penny Wan and Architect Francisco Vizeu Pinheiro.

[9] Rossi, Aldo. 1982. *The Architecture of the City*. Cambridge, MA: MIT Press.130.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Eco-Cybernetic Architecture

Jon Goodbun[1]

Abstract

In this paper I will try to weave together some of the intellectual ideas and practices that contribute to an eco-cybernetic conception of architecture, and will then show some examples of trying to apply this thinking to my own teaching and design research practice. I will conclude by evaluating these examples, discussing what has worked as teaching and design practice, and what problems can be identified. I will generally consider how this research might contribute to the expanded conception of design as the primary agent of socio-political and enviro-economic change.

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Introduction

In this short paper I will try to outline and reflect upon the design research that has emerged from and cross informed the three strands in my practice: as a teacher of architectural design, a working designer, and an academic winger somewhere near to finishing a PhD.

The core material comes from thinking about architecture as a fundamentally cybernetic practice and discipline. By architecture I mean the stuff that surrounds us. Physical stuff certainly, but physical stuff which is constantly emitting messages, in many different ways. By cybernetics I mean the study of systems, and more specifically the study of communications and control within systems, or between an observer (read inhabitant, user, co-designer...) and a system (Weiner (1948) etc). Typically today, any discussion about cybernetics and architecture tends to focus upon interactive environments, or upon other technologies embedded within the built environment that enable buildings to self regulate in some way, such as opening windows, managing the internal climate etc. These are certainly legitimate uses of the term cybernetic architecture, and indeed I will discuss many examples of these kinds of technological environments. However, I want to argue that architecture, as a field of communication and control, is a fundamentally cybernetic practice in a much more basic sense as well. Architecture is an extended mind-field, or consciousness ecology, constructed out of organised objects, media, signs, technology and people in space. An architecturally, or environmentally expanded theory of cybernetics, combines communications theory with morphology, pattern, archetype and demographics, and is profoundly ecological, in the fullest sense of the word. Architectural objects are cultural artefacts that work as a series of systems embedded within other systems. These systems are grounded in the experiencing body of the inhabitant. This body is partly natural, but it also extends out into the world, projecting itself into, or empathising with (Lipps (1935), (Schmarsow (1994), Vischer (1994)), or feeling alienated from (Marx (1959)), other fields, networks and systems (Castells (1996)), whether social, emotional, spiritual, economic, environmental, and technological (McLuhan (1964)). These extensions are primarily cognitive, but are also physical in important ways. They are formed and reformed by the clothes we wear, the buildings and environments we inhabit, the cities and regions that we live in, and the objects and technologies that we use and interact with (McCullough (2005)).

So this, in condensed form, is the ‘academic’ background to all my practice, which I have given the rather clumsy working title of an eco-cybernetic conception of architecture. The point is, is that it is not a question of *can* architecture and design be ecological - they *always already are* fundamentally ecological. Architecture and design are always already as much to do with processes and feedbacks, as they are objects. The question rather is of how *well* do architecture and design *perform* ecologically, and how *consciously*, in relation to other bigger planetary and social systems. The question is how can we find ways of conceiving of architecture and design in such a way as to be sensitive to these feedback loops, between ourselves, the objects that we make, and the world that they are a part of.

In this paper I will try to weave together some of the intellectual ideas and practices that contribute to an eco-cybernetic conception of architecture, and will then show some examples of trying to apply this thinking to my own teaching and design research practice. I will conclude by evaluating these examples, discussing what has worked as teaching and design practice, and what problems can be identified. I will generally consider how this research might contribute to the expanded conception of design as the primary agent of socio-political and enviro-economic change.

Steps to an ecology of (extended) mind

I really like this quote that I collaged together from Gregory Bateson. It is actually spread over a few pages, but I am sure that he would not mind.

"the elementary cybernetic system with its messages in circuit is, in fact, the simplest unit of mind; more complicated systems are perhaps more worthy to be called mental systems, but essentially this is what we are talking about… the individual mind is immanent but not only in the body. It is immanent also in the pathways and messages outside of the body; and there is a larger mind of which the individual mind is only a subsystem. This larger mind… is still immanent in the total interconnected social system and planetary ecology… when you separate mind from the structure in which it is immanent, such as a human relationship, human society, or the ecosystem, you thereby embark, I believe, on a fundamental error, which in the end will surely hurt you…. You decide that that you want to get rid of the by-products of human life and that Lake Erie will be a good place to put them. You forget that the eco-mental system called Lake Erie is a part of your wider eco-mental system - and that if Lake Erie is driven insane, its insanity is incorporated in the larger system of your thought and experience"

Gregory Bateson, Steps to an Ecology of Mind (1972)

In this piece of thinking the cybernetician (or anthropologist, ethnographer, biologist..) Bateson suggests that any organised system or ecology is in some sense a *mind*. This kind of thinking of course has a history - often a rather mystical one. However, it re-emerged with some force around Bateson and a number of related thinkers in the second half of the last century, and it continues to animate the thinking of many evolutionary scientists and philosophers today. In its most properly holistic form, this kind of thinking suggests that all matter, from the most elementary quantum particles and fields, up through atoms, molecules and so on up to planetary biospheres (often referred to as Gaia), should be thought of, in so far as they are organised systems, as minds. In the quote above, Bateson goes on to suggest that that the social systems that we construct should also be thought of as larger minds, and that both these, together with the planetary ecosystem, are in fact extensions to our own minds. Furthermore, he suggests that our minds are ultimately inextricable from these larger environmental minds - if they go mad, we go mad. In this piece of writing Bateson anticipated much of the research that has been produced in recent decades in cognitive science and biology, which for simplicity here I will group together under the name Extended Mind.

Extended Mind thinking emphasises the structural co-evoloution of an organism with its environment, to the point where it is difficult to define the boundary of the organism. It describes a fundamentally cybernetic and ecological conception of being in the world. The core argument of this thesis is that human consciousness cannot in any simple way be reduced and localised to the physical brain, but rather requires an understanding of what Bateson above refers to as "ecologies of mind". These ecologies are co-evolutionary, that is to say historical and environmental, temporal and spatial, and require thinking that goes beyond the cognitive sciences (Clark and Chalmers (1998), drawing in ideas from evolutionary biology (Sheldrake (1981,1991), Lovelock (1979), Harding (2007)) evolutionary psychology (Fodor (1983), Gardner (1983)), Cosmides and Tooby (2005)), anthropology and archeology (Wynn (1996), Mithen (1996), Lewis-Williams (2002)), and indeed architecture.

The basic 'Extended Mind' proposition was put forward by David Chalmers and Andy Clark (1998), in a paper of that name, and is essentially the idea that cognitive processes are not simply located in the brain, but extend out into the world. The term describes an "active externalism", or " the active role of the environment in driving cognitive processes". The classic example (first given by David Kirsh and Paul Maglio (1994)) is that of the scrabble player reorganising letters to help to find new letter-word combinations, as an example of the kind of structurally epistemic relationship that is set up in cognitive processes that are initiated in the brain, but are extended and completed in the world. They argue that the scrabble player is not

simply reorganising letters as representations of processes that are taking place in the mind, but rather is thinking by moving the physical letters.
The scrabble player is a particularly clear example of the kind of structurally epistemic relationship that sets up cognitive processes that are initiated in the brain, but are extended and completed in the world. However, the point I make is that architectural environments, are one of a number of ways by which we have socially extended our minds beyond the 'confines' of our physical brains, in the same way.

This work by Clark and Chalmers was in many ways a restatement, and development of, ideas that had been articulated in evolutionary biology in the previous decade. Closely related, and at time identical concepts, the Embodied or Embedded Mind, considers consciousness to be extended into and throughout the body, both literally, in terms of the extended nervous system, but also in a phenomenological sense, arguing that it is meaningless to talk about conscious experience without the structurally formative sensuous body. These ideas were developed in particular by Maturana and Varela (1987), who developed an innovative rethinking of the way in which organisms exist in the world. For Maturana and Varela, the organism must be thought of as coupled to its environment, and co-evolving with it, as a body and mind. They give as one example the movement of fish through water. Biologists had been puzzled for some time about the speed and agility that some fish in particular have in moving through water. It seemed that they were generally faster than would have been expected through an analysis of the strength and size of their bodies etc. However,it became clear that the fish cannot be understood by analysing their bodies in isolation. It is necessary to understand their movements as part of a system. They are highly sensitive to the flows and eddies that surround them, constantly using minor variations to gain advantage, momentum etc. They cannot be understood removed from their environment.

Clearly, whilst we humans do not exist in quite the same fully immersive fluid substance as fish, it is nonetheless meaningful and productive to ask: how have we co-evolved with our environments? The environments that we primarily co-evolved with were the natural ecological systems within which our bodies developed. According to recent critical archeological work by Steven Mithin, the kind of time frames that we need to consider here are firstly 2 million years ago, when our ancestor homo habilis started making tools, and secondly 100 thousand years ago, when our species, homo sapien sapien first emerged. However our species is unique in that it has learnt to manipulate its external environment to such an extent, that we can consciously intervene in the 'co evolution' that we share with our environments. By actively externalising much of our cognitive activity into shared mind-objects like cities, and mind-systems like language, we have been able to consciously act upon and effectively intervene in the evolution of our extended mind - ie the planet - for better and worse.

Cybernetics, sharpened through extended mind theory, can provide the epistemological and phenomenological structures that might allow us to both describe the existing, and design the future 'interactive architectural ecologies' which couple our embodied minds out into society and the physical environment. By interactive, I do not necessarily mean anything digital or mechanical, but I do mean technological - in the sense that the physical morphology which organises individual and social bodies in space is technological. Steps and platforms that one can sit on or lie down on, basic changes in level, frames and physical enclosure - these archetypal spaces, occupied and required by the most basic human activities, are the most fundamental way that architecture acts as a technology, an interface or prosthesis, and as extensions of the body. When morphology organises human bodies socially, it can be said to have archetypal architectural effects. Just as when driving a car our cognitive map of our body expands to envelope the machine as a prosthesis, so too when occupying architecture, we can project ourselves out, into and over the spatial interface. These interactive architectural ecologies are the basic structures with which we have co-evolved - our most immediate and fundamental interfaces with our environments and each other. Understanding how these various interfaces and feedback loops are mediated by architecture is what I mean by environmental cybernetics.

As the sociologist Georg Simmel intuited, there are correspondences between the forms of experience, the forms of society and the forms we make (Simmel (1903)). If traditionally, the knowledge contained within our social building practices was able to mediate stable mental relationships with the other minds of the biosphere with which we co-evolved, today we find ourselves in a very different condition. In a positive way, we have increasingly intervened in our evolution, and extended ever further our minds out into an environment now composed of a superposition of our first and second natures (Lukács (1971)), which in its modern global metropolitan network form I argue can be thought of as our shared, social, mind.

The geographer and sociologist Manuel Castells has argued that our contemporary condition can be described as a “bipolar opposition between the net and the self”, and he has suggested that if we are to take control of our futures, and the futures of our cities, then we need to build what he calls “bridges” (or we might say ’spatial interfaces’) between what he calls “the space of flows” (ie global information and capital networks) and the “space of places” (ie the real, local world and its specific geographies and environments).

If Bateson is right, we need to think about our emerging ecological crisis as a spatio-mental illness- for which we need to design spatio-mental therapy. Perhaps the ‘bridges’ that Castells calls for are part of the design solution.

Global metropolis, network architecture, ecology diagrams and patterns

This section starts by outlining a history or discourse around spatial networks that can be found and worked with, as new 'bridges', within our collective socio-spatial unconscious. In particular I focus on images of networks that combine our first and second natures... images that explore and develop a new social vocabulary, based on collages and assemblages of people, cities, food production, nature and technology. These include slides showing, in approximate chronological order, work by Antonio Gaudi, Bruno Taut, Frank Lloyd Wright, Buckminster Fuller, Paolo Soleri, Archigram, Superstudio, Cedric Price, Ken Yeang, CPULs, AOC, WAG, Jason Bruges, Usman Haque, Ruairi Glynn and others

This work charts a consistent engagement of modern architecture with questions of network. In some cases the projects should be interpreted literally, as design proposals. In other cases the work should be understood more discursively, as contributions to a discourse, using architectural projection as a means thinking philosophically about networks. All of these projects demonstrate an interest in thinking about how architecture as physical morphology creates contexts and scenarios in which new social engagements with other media can be facilitated (Shepard and Greenfield (2007)). In many cases these scenarios also posit social relationships to ‘the natural world’. Some of these relationships are highly progressive, others are dynamic, but in need of ‘reorientation’. Frequently this discourse has been weakest in thinking about the interconnected questions of procurement, ownership and co-design. There are other traditions within architecture that to some extent deal with progressively with these issues, such as work done by some housing association or co-housing groups. However, these in turn have tended to be weak on ‘bridging’ real archetypal place, to the ‘space of flows’. However, when considered together these projects describe visions of an Eco-Cybernetic renewal of our existing urban-global fabric.

These general visions are developed and explored in more detail through two new ongoing pieces of design research:

1. ‘Hackney Central Ecologies’ is a new sustainable masterplan for Hackney Central in East London. Co-ordinated by local architects WAG and working with students from a local university, this project is generated out of a new kind of drawing: the ecology diagram. Ecology Diagrams aim to capture in one drawing-diagram the various natural, technological and social flows of energy, matter and people, which define the spaces and times of any given site, in such a way as to facilitate an understanding of feedbacks between different system-ecologies. The local traditions of allotment food growing are expanded across a replanned town centre, and reconnected to local markets, co-ordinated through a new local information network, the Democratic Billboard.

2. The ‘Extended Ecologies’ project is a installation, to be realised later this year in London. It is structured around a scaffolding network that contains multiple levels, platforms and connections across and through the space that can be occupied by humans and other organisms and systems, both natural and artificial. The artificial organisms are largely composed of readymade robots and responsive installation pieces contributed by various artists. The proposal is to design an environment that they can ‘co-evolve’ with. Together these structures and organisms will form an experimental new cybernetic ecology.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Rethinking the smart home:

An environmental perspective

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Abstract

In this paper, we propose a vision of the "smart home" that diverges from current trends in home automation and home-as-machine paradigms, where lights are dimmed and music is tuned on to suit one's mood or where one can set the Jacuzzi's temperature from the car while driving home.

In the future that we hope for, the "smart home" is about intelligent management of resources – for personal cost savings and for the benefit of the environment.

The notion of a "smart home" must change to match people's day-to-day realities, and technology companies must shift their understanding of the relationships between people, technology, and the environment, to identify solutions that enhance everyday life with minimized impact to our planet.

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1. Introduction

Over the past few years the severity of the issues that this planet is facing has become not only noticeable but something to be addressed promptly and cautiously – from global warming to environmental degradation and the depletion of natural resources. Growing concerns have pushed governments, NGOs, corporations, regulatory entities and individuals to take action. Among these groups, technology developers and the broad HCI community have a great responsibility.

As Blevis (2007, 511) reports, in the USA 567 million (1/3 of worldwide sales) new Windows-based computers have been purchased since 1981 and nearly half of them have been purchased in the last 5 years, meaning that "the number of computers purchased new in the US in the last 5 years is equal to nearly 90% of the number of people who actually live in the US". Clearly, this is not sustainable from an environmental perspective. However, if we look at the matter from a different perspective, the HCI community and technology developers can balance their responsibilities by playing lead roles.

Blevis (2007, 313) highlights a link between interactive technologies and the use of resources, stressing how "interactive technologies can be used to promote more sustainable behaviours" and how "sustainability can be applied as a critical lens to the design of interactive systems". Recent work by Jain & Wullert (2002), Wash et al (2005), Gustafsson and Gyllenswärd (2005), Bång, M., et al (2006), Stringer et al. (2007), Mankoff et al (2007), and Blevis (2007) demonstrate how technology can be adopted to motivate and enable people to have a more sustainable behaviour, by using social networks as motivational tools, reducing ride sharing's coordination costs, promoting awareness around energy consumption, or focussing on the impacts of interactive or pervasive technologies from a use, development and disposal perspective.

As part of the User Experience Group at Intel Corporation, we typically concentrate our efforts around the home environment and, when looking at domestic technologies, we believe that the concept of "smart home" needs to shift: from a place of seamless automation to one of empowerment. The User Experience Group at Intel uses a blend of ethnographic, human factor and design research skills to develop user-centric consumer electronics products and technology solutions that can genuinely support people's values and practices. Our user experience design enables Intel's Digital Home to start with people to then define the experiences that they want and enable platform designers to create more compelling solutions for a richer user experience.

In this paper, starting from a brief analysis of how the concept of "smart home" evolved through time, we put forward four key principles and metaphors that provide a philosophical foundation for what we believe a smart home should really be about:

- The "smart home" is about using technology to empower people to control and maintain waste and resources in their own domestic landscape;
- The "smart home" has to be a communicative entity – capable of equipping people with a clear and solid understanding of what is going on around them, in their own homes;
- The "smart home" must be accessible, transparent and easy to "read", mirroring how people live (versus how developers, technologists, designers and engineers believe people live); and
- The "smart home" means different things to different people, requiring personalizable, customisable, local practices aware, socio-culturally relevant, open and networked technologies.

The paper is divided into five sections. In the first part we introduce the paper themes while in the second we offer selected historical examples demonstrating the evolution of the ideas

behind the “smart home” as they have led to today’s notions of home automation that caters to an unscaleable and unsustainable lifestyle for the privileged. In the third section, we outline underlining principles and metaphors that should be taken into account when designing the so-called “home of the future”. In the fourth part of the paper, we discuss how companies like Intel can actively support and promote sustainable lifestyle changes by driving alternative visions of the smart home. In particular, we discuss current Digital Home prototyping efforts and the benefits of “smart homes” that enable intelligent resource management. In the final section of the paper, we offer a number of concluding remarks and an overview of next steps to be addressed.

2. A Brief History of the “Smart Home”

We can trace the concept of “smart home” to the early 1980s and that, more generally, of a technologically-enhanced “home of the future” much farther back in time. Alongside the evolution of these idealistic domestic visions, our understandings of ourselves as inhabitants of such futuristic, “smart” homes – and of technology’s role in our lives – has changed over time as well.

Hardyment (1988, 1) points out how the industrial revolution has “turned the home from a productive unit into a consuming maw, and from a nest and refuge to a ‘physical service station’, a battery of bought conveniences from which individuals recharge themselves with food and sleep”. Homes today appear to be more like *shop window*s, rather than a place for baking, brewing and making clothes (Hardyment 1988, 2) – shop windows that are the products of relatively fast paced changes brought about by technologies and how we conceptualized them over time.

In the next sessions we briefly overview some of these changes, to show how the notion of “smart home” developed over time and to support the view that today’s notion of home automation caters to an unscaleable and unsustainable lifestyle for the privileged.

Forty (1992) discusses the impacts of the 1920s labour shortage, related to the introduction of electrically powered machines in the home – machines that could enable one person alone to manage an entire household and still enjoy left over leisure time. Opposed to this idealistic view of technology, Vanek (1974) argues how time spent in housework has hardly changed since 1926, regardless of domestic appliances’ introduction. Vanek’s view has been challenged by many, including Gershuny and Robinson (1988) and their argument that between 1965 and 1985 domestic technology has considerably reduced women’s routine housework. Although the argument around these opposing perspectives appears to be still unresolved, Cowan (1983) and Hardyment (1988) noted how in the 1940s an emphasis on consumption and the introduction of more domestic technologies implied an increase in time spent on housework, paralleled by an increase in standards.

During this first part of the 20th century domestic technologies increasingly populated people’s homes and did so at a fast rate: as a symbol of freedom from everyday chores and the promise of newly discovered leisure time. Even if the notion of “smart home” per se did not exist as we understand it today, the escalating inclusion of new (smart?) technologies in everyday life dramatically changed the notion of home and people’s relationships with time and space. Interestingly however, during this first of part of the century many thinkers, architects, artists and inventors were exploring the relationships between home and technology, challenging the notion of modernity, exploring the benefits of new technologies or investigating future opportunities. Examples include Fuller’s *Dymaxion Dwelling Machine* (1927) and *Aluminaire House* (1932) and William and George Keck’s House of Tomorrow for the Chicago World Fair of 1932.

With the Second World War things evolved again and the depiction of women as technically competent figures capable of freeing men from work outside the home contributed to the post war uptake of domestic technologies. Many women liked outside-the-home roles and needed to be free from domestic chores (Harper 2003): technology was there to address such a need. However, as men started to return from the war, women started to be encouraged to go back in

the home through propaganda depicting ideal images such as waving wives on the doorstep, smiling at their husband about to go to work – just before immersing themselves into daily domestic chores. The below extract from a 1950 article in *The Atlantic Monthly* describes the kind of social sentiment that was at stake:

> Instead of apologizing for being a mere housewife, as many women do, women should make society realize that upon the housewife now fall the combined tasks of economist, nutrition expert, sociologist, psychiatrist, and educator. Then society would confer upon the status of housewife the honor, recognition, and acclaim it deserves. Today, however, the duties of the homemaker have become so depreciated that many women feel impelled to work outside the home in order to retain the respect of the community (Agnes E. Meyer in Plante 1995, 283).

During this time modern technology increasingly supported new ways of living, considerably changing home design: new kitchen styles emerged to accommodate refrigerators and washing machines and television lounges were introduced alongside a substantial increase in TV sales (Aldrich 2003). In brief, the latest home technologies functioned to demonstrate prosperity – as props for the perfect housewife in her display of domestic prowess. During this time the reality of domestic technologies as tools to enable new lifestyle were paralleled by a vast array of visionary and critical explorations of the home and its future.

Mon Uncle, a 1958 movie by Jacques Tati, ironically explores ultra-modernistic notions of the home, where everything is automated and gadget-like, including a candy-coloured space age home complete with neurotic houseboat and automated dogwalker. In Robin Boyd's *House of Tomorrow* (1949) – a two-storied home which included a lounge-room, a study, a dining room with kitchen and a bedroom – technology and the notion of *good taste* were mixed to illustrate modernist aesthetic ideals as well as a new and contemporary way of life. In this modernist proposal of the future, technology played a pivotal role and not only from a structural perspective. A good example was a mocked-up television which anticipated its introduction in 1956 (Serle 1996, 96).

As the 60s and 70s approached, new belief systems related to the role of women in society overturned the 50s ideals: more women had out-of-home occupations and technology was consequently needed to save time and effort within the household. During this time a vast array of domestic technologies emerged, from automated kitchen utensils (e.g. food processors) to personal care (e.g. electric razors) and cleaning devices (e.g. vacuum cleaners). The *house of the future* came to mean something more than simply a collection of futuristic looking technologies collected under one roof. During those decades our imaginary future homes edged ever closer to a vision of the home itself as a machine, capable of precise automation in the service of our human wants and demands for uninterrupted comfort.

During this time of socio-cultural shifts and positive appreciation of the future, new materials and technologies offered the opportunity to explore new options and, importantly: freedom. Consequently, many architects and designers explored the notion of the future home, exploring materials, new structural possibilities and futuristic technologies. Famous examples include Disneyland's Monsanto's *House of the Future* (1967), made almost entirely from the latest plastic technologies, and Matti Suuronen's *Futuro* (1968), a prefabricated space-age home made of fiberglass-reinforced polyester plastic that summarized the typical utopian architecture of the era: mobility, leisure and new materials. An increased interest in wiring homes to augment their functionality started during this time. America's Independent Electric Light and Power Companies for instance promoted during that time a home of the future where "electrically operated climate-conditioned extensions will permit *summer terraces* all at will by your electricity" (in Heimann 2005).

In the 1970s and 1980s colour TV set dramatically penetrated the market, together with video cassette recorders, compact disc players, microwave ovens and personal computers – these technologies considerably changed the home landscape as it was known. In many ways the two previous decades can be seen as preparatory for the 1980s trend toward "smart homes,"

where advanced control systems automate the domestic space in seamless ways that isolate inhabitants from the realities of their environment.

Following the *Cooperative Research and Development Act* passed in 1984 by the U.S. Congress, the National Association of Home Builders (NAHB) in Washington, D.C. formed the SMART HOUSE Limited Partnership with the aim of providing integrated wiring for all current home services and provisions for home automation technology. NAHB's vision was that of a computer-controlled home: a house, condominium, or apartment where people can spend more time pursuing life's rewards and less time performing routine household tasks (Howard and Wagoner 1991). The concept of the smart home was officially born.

Within this context people started integrating new technologies in their homes in different ways and similar technologies implied a variety of social changes in different parts of the world.

Ironmonger et al (2000) for instance describe how different types of Australian households adopted new technology at different rates, with higher technology adoption in households with children and slower in one-adult households. Trend analyses revealed that color television, cable television and the videocassette recorder collectively played a major role in expanding the share of disposable personal income devoted to mass media in Belgium between 1970 and 1991 (Dupagne 1997). In the US 95% of the households had a TV in 1972 (half of them in color), HBO opened its doors in 1975 and by 1987 half of U.S. TV households (about 55 million) subscribed to basic cable. Finally, the introduction of personal computing in the home opened up new opportunities for work, play, connecting, learning, and doing business, significantly impacting everyday life, from spatial, time and speed perspectives. Aldrich (2003, 20) highlights how through time different forms of domestic technologies have been adopted at different rates and how such a trend might have implications for how smart home technologies might be adopted in the future, reiterating Bowden and Offer (1994) a distinction between "time saving" goods (such as washing machines) and "time-using" goods (such as the television).

Since the 1990s the concept of smart home has permeated popular culture (Aldrich 2003, 22): from publications in popular magazines such as Vanity Fair to television programs such as BBC's *Dream House,* the idea of inhabiting a smart home has become of public domain, together with related fears, uncertainties, concerns and dreams.

The uptake of home automation and control technologies has however been slower than predicted; many of the ideas behind these homes of the future and the associated promises of housework-free living do not match people's day-to-day reality. Gann et al (1999 in Aldrich 2003, 22-3) suggest a number of reasons for such a slow uptake, including: relationship between the required high initial investment and the its benefits; the costs associated with "retrofitting" old homes versus wiring new homes; a lack of common protocols and the consequent focus on on/off switching systems for single applications; suppliers narrow "technology push" approach and lack of users' needs; and little usability evaluation by suppliers.

Nonetheless, the dream of a technology-enhanced home of the future continues to permeate current thinking around smart homes and domotics. Technology companies are equally caught up in this dream, which isolates them as well from the realities of domestic living and from the impact that their home technologies have on people's aspirations and expectations and, in the end, on the environment.

At the 2008 Consumer Electronics Show (CES) Bill Gates described a home of the future in which computing power will be available in every room, through embedded-in-furniture touchscreens. To have a clearer understanding of such view of the future home one can refer to what is called *Microsoft Home*, modeled on Bill Gates' own Seattle mansion.

Microsoft Home, powered by four PCs running Windows XP, features dozens of networked monitors, Xboxes, appliances, and consumer electronics devices scattered everywhere: security and entry to the future home is enabled through an electronic kiosk with a touchscreen, a biometric scanner, and a smartcard reader; as one enters lights and heat automatically fine-tune to one's preference and a screen on the wall reads emails aloud; in the kitchen one can run a pot

beneath the barcode reader on the microwave and automatically set time and temperature or get help with cooking by scanning RFID tags on specific ingredients; digital media is everywhere and accessible from any room, on every device, thanks to a central media server which supplies entertainment throughout, seamlessly streaming content where is needed (O'Brien 2003).

Microsoft does not stand alone, of course, as the source of our collective vision of a future smart home. It is precisely this type of vision of embodies in our view the type of future home that should be re-considered: it represents a concept of home automation that caters to an unscaleable and unsustainable lifestyle for the privileged. In the following sections, we propose alternatives to this lifestyle and discuss how companies like Intel can actively support and promote sustainable lifestyle changes by driving alternative visions of the smart home.

3. Smart homes for the rest of us

Blevis (2007, 503-4) overviews five principles that set sustainability as the focus in the context of interaction design: linking invention & disposal; promoting renewal & reuse; promoting quality & equality; de-coupling ownership & identity; and using natural models & reflection.

Gann and Barlow (1998, 13) discuss how the smart home industry must "motivate consumers to buy its products" and therefore develop "solutions that satisfy real user needs" – solutions that have to "operate as (1) *generic technologies*, providing the basic, standard compatible building blocks for (2) *context-specific systems*, adaptable to a wide variety of dwelling types, and (3) *personalised systems*, tailored to specific individual and household requirements". The authors (Gann and Barlow 1998, 13) also highlight how smart home solutions must satisfy a number of conditions:

- Functionality – the equipment/system must have clear and unambiguous functions;
- Ease of use – clear and simple user interfaces, interactivity and connectivity;
- Affordability – for individuals and housing providers;
- Reliability and maintainability;
- Flexibility, adaptability and upgradability – systems need to develop as user needs change; and
- Replicability and ease of installation – systems need to be available as a standard, reproducible product.

While we agree with Blevis' and Gann & Barlow's views, we would like to add a set of nested underlying principles and metaphors that provide a philosophical foundation for what we believe the smart home should be.

First of all, we believe that on a conceptual level the notion of "smart home" has little to do with that of automation, where technologies in the home can predict one's mood and reconcile one's preferences, seamlessly and automatically. We indeed believe that the "smart home" needs to be about using technology to *empower people to control and maintain waste and resources in their own domestic landscape*. To do this it is crucial we conceptualize the home as an ecosystem that generates waste and consumes resources. In such a paradigm, "smart" means capable of helping people manage their resources and waste.

An ethnographic study conducted by colleagues at Intel in 2006 and 2007 (Woodruff et al. 2008) reported how for participants the notion of living in a "green home" meant "constant activity to keep it in tune with nature's changing state and rhythms", to minimize energy use and maximize comfort "by constantly reconfiguring windows, doors, skylights, solar panels, etc". The metaphor of *living on a ship* was often used by participants to refer to this ongoing configuration and maintenance, embedded in their experiences of living in a "green home". This "living on a ship" metaphor comes directly from everyday practices around the use of technologies to live in a

“greener home” and it mirrors our proposition that a “smart home” is about the capacity of controlling and maintaining waste and resources, instead of spectable and the seamless automation of multiple “intelligent devices”.

Within this paradigm, we secondly propose that the “smart home” needs to be about information, not spectacle. We believe that the smart home has to be a *communicative entity* – capable of equipping people with a clear and solid understanding of what is going on around them, in their own homes. Within this paradigm, “smart” means practical, everyday, accessible, and, more importantly, in touch with the relationships between house and household – place and inhabitants.

If we accept the above notion of the mart home as a communicative entity, it is clear that today’s smart homes often do not allow people to be smart. Today the home is indeed un-transparent about what it does, when and why. This generates a situation where its inhabitants cannot clearly and easily see what is occurring and what would enable them to make smart decisions. We consequently propose that a home is smart when it is *accessible, transparent and easy to “read”*.

These features align themselves with the conditions proposed by Gann and Barlow (1998, 13) overviewed at the start of this section. This notion of accessible, transparent and easy to “read” smart home is fundamentally about developing technologies that mirror how people live, versus how developers, technologists, designers and engineers believe people live. To gain such deep understandings and embed them into the design of new home technologies, developers must ensure ethnography and design research efforts are natural components of the development cycle and that such insights are truly embedded in it – from its start to the end.

Only by gaining a rich understanding of what, how and why people use the world around them the way they do, we can find ways to design accessible, transparent and easy to “read” smart home technologies.

Finally, while for some (like Bill Gates) “smart” means one thing with one solution, we believe that for the rest of us *smart home means several things*, as the home is a complex, multi-layered and multi-faced entity where new technologies increase complexity, generate possibilities and potentially create unnecessary and un-transparent layers. Different geographical location and socio-cultural environments call for technology solutions that take such differences into account and that stay away for *one-size-fits-all*. Personalization, customization, local practice awareness, socio-cultural relevance, open platforms and local networks all play a crucial role in the development of home technologies we believe can make our homes smart.

To summarize, we propose that a paradigm shift must occur and that we must reconceptualise the idea of “smart home” as a *communicative entity* that employs *accessible, transparent and easy to “read”* technology which empower people to *control and maintain waste and resources* in their own domestic landscape in a manner that is *personalizable, customisable, local practices aware, socio-culturally relevant, open and networked*.

4. Changing the Change from Within: a Corporate Credo

The perspective we represent in this paper, and to this community of researchers, is squarely rooted in the authors’ collective backgrounds as design academics and, now, as corporate practitioners of design research. We are not so naïve as to believe that corporations might altruistically lead the charge toward a sustainable future – not until there is clear evidence of profit in that direction. On the other hand, we know that large corporations can instigate widespread change: their weight may make steering them an unwieldy operation, but, when they decide where they are going to land, their impact can be mighty powerful. And it is ultimately the individuals working within corporations who set the company’s direction and decide its goals.

In this section of the paper, we discuss how companies like Intel can actively support and promote sustainable lifestyle changes by driving alternative visions of the smart home. In particular, we discuss current research and prototyping efforts within Intel's Digital Home Group, and, in as much as we feel we have achieved some success in shifting the corporate conversation at Intel in a positive direction, we offer these thoughts on what we might have done well when we were most successful. Every organization will be different, of course. Accordingly, we submit the following principles as our own credo, in which others may find helpful guidance when it comes to rethinking their visions of a sustainable, technological future from within a corporation.

Change the conversation. That would have to be the first principle and the cornerstone of our approach as outlined in this paper. As designers working in the high-tech industry, we are responsible for communicating back to the company – and eventually back to the many other companies we work with, and to the end consumers of their products – a coherent vision of the integration of the industry's technological advancements in people's everyday lives. We do not work alone in that endeavor: we would not get very far if we tried. But by joining our voices with those of like-minded individuals throughout the company – in corporate strategic planning, in public relations, in sales and marketing – a growing group of committed individuals has been successful in shifting internal conversations about Intel's sustainability initiatives: away from a singular focus on producing ever more energy efficient products and toward a broader conversation that encompasses not only the corporation's responsibility to maintain greener office buildings and production facilities, but increasingly to one that highlights new business opportunities in enabling eco-technologies[3].

We could consider the glut of electronic gadgets to which we contribute simply part of the world's problem, or we could rethink our products and the services they enable in ways that will best support sustainable end-user practices (by promoting telecommuting over air travel, to give an obvious example). In Intel's Digital Home Group, we have begun to talk more frequently about home electronics not only as devices that draw power in order to provide us with entertainment, but also as devices with which we may outfit homes of the future so as to empower their inhabitants to intelligently manage home systems and the consumption of non-renewable resources. Our challenge to ourselves has become: "How can we leverage the 2% of overall household energy typically used to power the home PC, to significantly curtail the remain 98% of residential energy consumption?" (US DoE, 2001).

These conversations have been heavily – if second-handedly – influenced by the rhetoric and ideas of *bright green environmentalism*, championed at Intel by our colleague Jay Hasbrouck (Hasbrouck and Woodruff, 2008)[4]. "[B]right green environmentalism," according to writer Ross Robertson, "is less about the problems and limitations we need to overcome than the 'tools, models, and ideas' that already exist for overcoming them. It forgoes the bleakness of protest and dissent for the energizing confidence of constructive solutions" (Robertson, 2007). Its proponents tend to look optimistically toward human innovation, smart design, and new technologies to provide answers to the human-made problems of our environment (Wikipedia, 2008).

As such, it can be an extremely empowering force in a culture of solution-driven engineers. Nonetheless, that change in the corporate conversation has not happened quickly. Convergence on the talking points that have now begun to take hold has been the hard-won product of many conversations and much repetition. And it has been aided by the rhetorical value of prototyping and simple mock-ups – by our ability to show our colleagues what it might look like to provide end-users with the capability to measure and then to model their homes' inner workings, to set rules for heating, cooling, and appliance use that respond to real-time fluctuations in energy costs,

[3] We should note that Intel has a long history of working with the U.S. Environmental Protection Agency on a range of environmental initiatives, including Climate Savers (http://www.climatesaverscomputing.org), and is consistently recognized for its efforts to improve sustainability of its operations (http://www.intel.com/intel/environment).

[4] The term "bright green" was first coined by American blogger and author Alex Steffen in 2003 to characterize an emerging, more technology-friendly school of environmentalism, in contrast to the traditional, "dark green" environmentalism which, to over-simplify, advocates the return to simpler ways of living and radical political change as the path to a sustainable future (Wikipedia, 2008).

and to monitor real-time feedback on their energy consumption from the computing and display devices distributed throughout their homes.

Change the metaphor. In short, this is the single, simple point we would like to make with this paper. The biggest roadblock we have encountered in introducing design concepts for computer-supported sustainable living has not been our colleagues' resistance to acknowledge that human impact on the environment is indeed a real problem, nor has it been failure to recognize a potential business opportunity in home automation and control: it has been fatigue. Any mention of "smart homes" within the organization is likely to draw a familiar, frustrated response from our well-seasoned technologists: "We've been down that path before". It is this frustration and disillusionment with the technological dreams of the past which has made it so important for us to redefine what it might mean for homes to be "smart".

Our "smart home" is a response to a new set of technological and social circumstances: a widespread and growing base of installed home networks that allow for the piecemeal introduction of networked devices and distributed sensors on the one hand, and the rise in consumers' awareness of the impact of their aggregate personal actions at a global level on the other. The "smart home" for us is now inextricably linked to both a negative (the old, unrealistic vision of a domicile designed to pamper its inhabitants while minimizing the need for human effort or imput) and a positive (the "smart home for the rest of us" described in this paper).

Persist in taking on the tough, small problems. While it can be helpful to sketch "the big picture" in explaining our particular ideas to others, it is often necessary that we tackle big problems from many fronts simultaneously. That means taking on small, but very tough, design challenges. Here we offer a concrete example in the user-interface problems associated with home energy management devices. Early in our explorations for smart homes equipped with whole-home energy management solutions, design team members installed in their own homes devices currently available on the market for monitoring and controlling home energy consumption. The results of those studies remain unpublished, as we are unable to put ourselves in the position of critiquing other companies' products, but we can report that there are many shortcomings associated with the available consumer solutions (this is a product category that would benefit greatly from the attention of a few concerned interaction and experience designers). Home energy monitoring devices were found to be difficult to install and set-up, often requiring the assistance of a professional electrician and labelled to warn consumers of the potential for death in the case of mishandling at instsallation (not generally considered the hallmark of a user-friendly product). While all the devices our collegues tested provided them with data, none but the most elaborate systems currently available (and generally installed only in newly constructed homes) provide information that suggest to users actions they might take to improve their current energy comsuption patterns. Providing actional information on the operation of home systems has become one of our driving objectives.

Even more discouraging were the findings of scientists who have determined that programmable thermostats – perhaps the simplest and certainly the most widely adopted of efficiency-oriented smart home appliances – may actually decrease the energy efficiency of home heating and cooling systems. In 2005, Energy Star endorsed a number of commercially available programmable thermostats, but by 2006 was forced to rescind that endorsement in the face of mounting evidence that homes equipped with programmable thermostats were not more efficient and were, in some cases in fact, less energy efficient than the same size homes using standard mechanical thermostats (Meier, 2007)[5]. The empirical findings at first seem implausible. How could a programmable thermostat, which is "smart" enough to automatically adjust the temperature in my home to optimal levels for every hour of the day, regardless of whether or not I remember it, be less efficient than the old-fashioned human-operated switch? Most of the blame has fallen on the user interface. Many users, it turns out, never properly learned to program their thermostats. Others used theirs just as they would use a mechanical thermostat – as a switch to

[5] Energy Star is the US Government program that promotes energy efficiency products and practices, in part by setting standard, energy-efficient performance requirements and endorsing products that achieve those standards (http://www.energystar.gov).

turn up the heat or cooling fans, regularly over-riding the programmed climate controls (Meier, 2007).

The simple residential programmable thermostat may be the example that best demonstrates the shift in metaphorical thinking proposed here in this paper; given a bit more thought up front, we may even have predicted such an outcome. Thermostats, for most of us in the US anyway, generally include a single temperature sensor integrated (and located together) with a wall-mounted control unit. The programmable thermostat adds to that configuration the ability to set rules for high and low temperatures and, often, accommodates alternate schedules for weekends and weekdays. We might have predicted that, as humans, we are unfortunately unskilled when it comes to predicting exactly how warm or cold we might be on any given Sunday or Monday of the year; whether we are likely to appreciate a warmed home when we return, on schedule, at 7:00 each evening, or if we might not have thought to turn the heat until several hours later when temperatures outside had reached much more uncomfortable lows. It might just be that "comfort" is more difficult than we had expected to peg to a specific measure of Celsius or Fahrenheit. Today's programmable thermostats may be too "smart" for their own good. Then we must account for the thermostat's singularity of placement. It may be a minor inconvenience that at the moment I recognize my slight discomfort of having just barely over-heated (or over-cooled) my home, I am not in the same room as my thermostat control. It may add only a few minutes to the time it takes me to adjust that control (probably the next time I happen to pass by the thermostat). But cumulatively, each of those hesitations might be just enough to make a big difference in my energy bill. Add all those factors to the simple usability problems of most commercially available programmable thermostats, and the findings which led to Energy Star's retraction of its original endorsement seen much less a puzzle, and much more a hairy UI design problem. At Intel, it has signaled the opening of an opportunity to employ some of the company's research in distributed sensor technologies and to establish a guiding vision of how mobile and embedded displays that have spread throughout our homes might be thought of as useful components in a system of home controls which empowers people to be smart about their own home energy use.

Demonstrate viability by demonstrating resonance. We rest assured that we will eventually be called upon to answer the question: "but how big is the market?". In many ways a focus on "green" solutions can make it too easy for executives to dismiss sustainability-minded initiatives as catering to a niche – a negligibly small group of left-over hippies who have taken up residence in the American Pacific Northwest. Executives need to see the numbers that affirm a concept's viability by confirming the size of the available market. In early 2008, we had an opportunity to conduct a six-country, 2400-person survey with the Nielsen Company. Our aim was to evaluate the appeal of some of our smart home product concepts and, more broadly, to understand people's (consumers') level of commitment to, and motivations for, engaging in sustainable practices at home. Much of the existing research in this area is limited to a specific market or region of the world, so we were very fortunate to have this opportunity to survey a large, international sample. While it is beyond the scope of this paper to report the results of that survey here, we can report that we were surprised – perhaps because of our own cultural prejudices – by our survey respondents' consistent sensitivity to the impact of personal choices on global conditions, and by the willingness, even eagerness, to invest personal energy – time, and even money – in smarter solutions and individual actions that might reduce their environmental impact. Across the six countries surveyed (US, Australia, Germany, Italy, China, and South Korea) we found the most enthusiasm from our Chinese respondents, 66% of whom said they would be willing to spend both more time and more money if it meant being environmentally responsible[6]. It is in research findings like these that we find the data we need to respond to critics who continue to believe that people are unwilling to participate in the intelligent management of their own resource consumption, and to win the continued support of the companies we work in our pursuit of smart home solutions for the rest of us.

[6] Findings of a survey conducted by the Nielsen Company for Intel Corporation, March 2008.

5. Conclusions

In this paper we briefly reviewed how the notion of “smart home” evolved till today’s concept of smart home as a place of seamless automation: a concept that in our perspective caters to an unscaleable and unsustainable lifestyle for the privileged. We then counter-proposed alternatives to this lifestyle by overviewing a set of four nested underlining principles and metaphors that provide a philosophical foundation for what we believe the smart home should be about. We finally discussed how companies like Intel can actively support and promote sustainable lifestyle changes by driving alternative visions of the smart home, offering insights on the principles that we adopted as our own corporate credo.

Within the paradigm we just offered, the future “smart home” that we hope for is related more closely to the intelligent management of resources – for personal cost savings and for the benefit of the environment. To achieve this result, the notion of a “smart home” must change to better match people’s day-to-day realities – technology companies must shift their understanding of the relationships between people, technology, and the environment in order to identify solutions that enhance everyday life with minimized impact to the planet on which we live.

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Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

Fashion that helps us flourish

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Abstract

Designing and making fashion clothes that *help us flourish* would transform the fashion industrial system at root. Not only would it change what we design and produce, it would also influence consumption. It makes a distinction between a culture defined by its material consumption and one that is catalysed by using material and non-material satisfiers to help us engage, connect and better understand each other, our world and ourselves. This paper explores these ideas, introducing this unconventional agenda and examining what format fashion could take if designed to help us flourish.

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1. Introduction

It is an obvious truth that the relationship between fashion and high volume consumption conflicts with sustainability goals. In the UK we are now buying one third more clothes than four years ago and nearly 40kg of clothing and textile waste is discarded per person per year (Allwood et al. 2006, 4). The negative sustainability implications of this high volume consumption is still a taboo subject for global brands and high street retailers who depend on a high throughput of product for financial success. Indeed, high product throughput has come to characterize everyday living in the West, where shopping and spending are the leisure activities of choice. Fashion is at the forefront of the consumerist lifestyle, where we meet our desire for pleasure, new experiences, status, and identity formation through buying goods – many of them clothes. And because we have an inexhaustible supply of desires, consumption - particularly of new items – continues to grow because we see the purchase of each new item as providing us with novel experiences that we have not so far encountered (Campbell 2006, 284). In the first decade of the twenty first century we shop for clothes addictively, frequently with money we don't have and are trapped by record levels of credit card debt. The pressure to constantly reformulate identity in the light of changing fashion trends helps feed psychological insecurity and rising levels of mental illness. Not only is fashion consumption a sustainability problem, but so is fashion production: manufacturing garments exploits workers, fuels resource use, increases environmental impact and generates waste.

Thus it would seem that the fashion industry is a near-perfect case study in all that is pejorative and reprehensible in the arena of production and consumption. And that fashion, rather than helping us flourish, i.e. helping us engage, connect and better understand ourselves, each other and our world (as is suggested by the title of this paper), is, for the most part, obstructing and actively undermining this process. Indeed there is little dispute that fashion is part of the sustainability problem. For some people the best way to 'fix' this problem is to subject fashion and its creators to controls and constraints and legislate against its ill effects. But cutting back, limiting and stipulating what we can't do or can't have is ultimately a negative view of sustainability and fails to recognize the importance of fashion to human culture. It stops short of showing us what *is* possible. Fashion can, and indeed must, be cast in a different role: as an integral part of a range of sustainability solutions. This paper explores one approach to designing fashion that helps us identify the causes of sustainability problems and cultivate new aspirations.

2. Value-free fashion

For many people the tension and apparent paradox between the competing values and objectives of both sustainability and fashion are almost too great to resolve. These values and objectives seem to call upon disparate parts of knowledge, experience, society and almost even different parts of our brains. Sustainability is concerned with the long term, with material restraint, natural integrity and promoting human well-being. Fashion in contrast, is communication, display, the production of symbols and 'the perfect investiture of the now'. For some people, fashion is the epitome of value-free expression and equips us to appear in a world that has little or nothing to do with the earth, the health of its soil or its people but is instead a world of ideas (Farrell 2008, unpaginated). Indeed, in this world of absent connections between fashion and the social and ecological systems that support it, almost anything is possible; there are few limits.

For critics of fashion, it is this free-floating limitlessness that feeds many symptoms of unsustainability including: consumerism, insecurity, peer pressure and homogeneity. This degradation is further fuelled by the globalization of fashion, described as 'McFashion' (Lee 2003) where the same garment and same shopping experience is available in the New York, Tokyo and London retail outlets of a global brand. Also implicated are serious medical conditions such as anorexia and bulimia, tragically common among young women and men, and high levels of stress linked to the need to constantly reformulate our identity each season. Not only can fashion damage individuals and escalate consumption and disposal (consumerism is as much about individuals disposing of goods as about buying them) but fashion trends themselves have confused sustainability issues and promoted misconceptions. Here passive consumers 'follow' the trends prescribed by industry and choose between pre-fabricated, largely homogenous goods. These products boost the elitist myths that have built up around some brands and designers. They allow the fashion system to mystify, control and 'professionalize' the practice of designing and making clothes and further dictate how we consume them. The result is disenfranchised and dissatisfied individuals, who feel both unrepresented by the fashion system and unable to do anything about it.

3. The cultural value of fashion

It is fairly easy to frame fashion as the villain of the piece with regards to sustainability. Most of us are already familiar with the serious labour abuses, high resource use and pollution impacts associated with making fashion clothes, let alone the numerous issues associated with (over) consuming them. But how do we go about moving from analysis of what is wrong with fashion to imagining and creating something that is right? For many people (including some policy makers, industry executives and environmental campaigners) what is 'right' is the same as reducing the impact of what is 'wrong' and a great deal of effort is expended on implementing changes that slow down the process of environmental degradation and social injustice. Indeed these approaches are valuable and bring some benefit particularly in the short term. Yet there is no getting away from the fact that such approaches are borne out of negative starting points: they frame things in terms of what we cannot have and what we cannot be, rather than showing us what *is* possible. So for example, such changes suggest that we filter wastewater from a dye house. But while this cuts down on river pollution downstream, it does not show us alternative ways to colour fabric. Likewise, substituting organic cotton for conventional fibre in a garment is recommended. But while this reduces chemical use in the field, improves the health of workers and reduces soil toxicity, it does not present us with a way to design garments that are loved and cherished for many years. Similarly they suggest that we choose second hand clothes. But while this saves water and energy in production, it doesn't show us what form conscientious and sustainable buying habits will take.

In short, many of these popular approaches attempt to navigate us to a place we want to be (sustainability) by extrapolating from a place we don't want to be. But this is an impossible journey. Industrial ecologist John Ehrenfeld (2004, 4) states: 'creating sustainability is not the same as reducing unsustainability'. He continues, 'They are categorically different. Unsustainability is measurable; it can be managed and incrementally reduced. But sustainability – the possibility of flourishing in the future – is aspirational'. Yet it seems that, in the fashion sector at least, we have been very slow on the uptake of recognising the imperative of creating a sustainable future that is not just an extension of how we do things today; that is something that flows from different ways of thinking and acting to those we have used in the past. This is perhaps all the more astonishing given the centrality of fashion clothes to human culture. Fashion clothes are important to our relationships, aesthetic desires and identity. Throughout history clothes have been at the centre of how human interaction; they are an expression of gender,

sexuality, age and ethnicity. Yet bizarrely when it comes to exploring new and different solutions to sustainability questions in fashion, this very cultural value tends to be diminished, rather than celebrated. Emphasis is placed on constraining the actions of designers and manufacturers, rather than attempting to cultivate synergies that flow from bringing these players together to address common concerns. We argue that it is in the action of celebrating the individual, societal and cultural value of our clothes that new opportunities emerge for us to create sustainability and help ourselves and our world to flourish.

4. Fashion and needs

Central to this vision of fashion is an understanding of needs. Not all clothes meet needs in quite the same way. For example, fashion clothes and non-fashion clothes are different entities and meet different needs. While the ostensible function of non-fashion clothing is material – to protect our modesty and keep us warm, this function changes for fashion clothes. Fashion clothes are used to signal who and what we are, to attract (or repel) others and to put us in a particular frame of mind. These emotional needs are complex, subtle and inexhaustible and where we try to meet them through our clothes, leads to an escalation in how and what we buy. It follows therefore that understanding more about the relationship between fashion and sustainability is contingent on a greater understanding of needs. If we want to avoid depriving people of their need for identity and participation, we can't just forget about fashion and scrap everything other than the wardrobe basics. In other words, we can't radically cut consumption of clothing until we begin to understand its significance as a satisfier of human needs.

Humans possess specific, identifiable needs that are the same, regardless of nation, religion or culture. Manfred Max-Neef (1992) has identified these as subsistence, protection, affection, understanding, participation, creation, recreation, identity and freedom and they fall into two broad categories: physical (material) needs and psychological (non-material) needs. Crucially while these needs stay the same, what changes with time and between individuals, is how we go about meeting or satisfying these needs. Some of us may, for example, satisfy our need for identity with fashion while others may meet this need with religion, language, work etc. Each way of satisfying needs has different environmental and social impacts. Where these satisfiers are products or services (though they can also be social practices, forms of organization, political models and values), they are the traditional - if unconscious - focus of design.

We consume materials to put a roof over our heads, keep us warm and well fed. Increasingly – as is the case with fashion - we also use them to help meet our non-material or psychological and emotional needs. Here lies a paradox: psychological needs are not easily satisfied, and in some cases are even inhibited, by consuming materials alone. Thus consuming material goods doesn't stem our desire for more material goods if we are buying them to meet psychological needs. Many of us will, for example, be familiar with the feeling of a new want or desire surfacing no sooner than the first one is satisfied. Put simply, consuming materials gives us a false sense of satisfying our psychological needs - a fact long recognized by many religious communities as seen in their guidelines for living materially-simple but active and spiritually-rich lives. This point is further reinforced by a number of studies that suggest we are no happier now than in the 1950s, even though we own far more material possessions. Max-Neef stresses that needs are met by a combination of internal and external means, yet in our society, as Ann Thorpe (2007, 118) points out, most satisfiers come from sources outside of ourselves (like garments), with very little attention placed on internal means such as personal growth. The pursuit of commercial opportunity has drawn psychological needs into the market place and replaced internal means of meeting needs with products. Marketing techniques have been perfected that

link products like fashion clothes to non-material needs and where the consumption of fashion is a way to signal wealth, identity and social status and experience new things.

Understanding needs helps us understand why fashion is important to us. According to Max-Neef, any fundamental need that is not adequately satisfied reveals a poverty. Just as people are poor when they have insufficient food and shelter to meet their need for subsistence, poverties can also be experienced in relation to other needs. We are poor if we experience bad health care, domestic violence, etc. (a poverty of protection); and poor if we cannot for reasons of widely dispersed family groups, oppression, etc. meet our need for affection. We are also poor if we can't satisfy our need for identity, participation and creation – three needs which can (at least in part) be met by fashion. Yet fashion clothes as we experience them today are also the cause of multiple poverties; impairing the possibility of garment workers to meet needs of subsistence, protection and freedom due to low wages, forced overtime, sexual harassment etc; damaging our collective rights to enjoy a safe and convivial natural environment through toxic pesticide use and chemical pollution; and inhibiting our need to participate, understand and be creative by being sold 'closed' ready-made products with little opportunity for self-expression.

Our real design challenge is to build a new vision for fashion that satisfies needs and minimizes poverties. To do this we must first understand what represses or stimulates opportunities for meeting needs. Then we must apply this understanding so that we minimize negative effects and maximize positive ones. To minimize the negative effects, we can begin by making simple changes such as switching to fair trade and organically-grown materials. To maximize positive ones we can establish decentralized local production facilities and promote participative design between user and maker. This changes the emphasis of our practice away from producing goods that undermine us and the health of our environment and society and onto those that nurture our well-being. Max-Neef (1992, 202) describes this as a shift from a system where 'life is placed at the service of artefacts (artefacts are the focus)… to (one where) artefacts at the service of life (quality of life).' This simple shift changes the goal of the industrial system. It is a distinction between a culture defined by its material consumption and one that is catalysed by using material and non-material satisfiers to help us engage, connect and better understand about each other, our world and ourselves. John Ehrenfeld has described this as *flourishing*: 'our artefacts need to be designed to support conscious choice and reflective competence rather than blind consumption. They should produce long-lasting human satisfaction… We will be able to flourish simply by living life as we encounter it' (Ehrenfeld 2004, 7).

Designing and making fashion clothes that help us flourish would transform the textile industrial system at root. Not only would it change what we design and produce, it also influences consumption. Max-Neef suggests that if we promote a broad understanding of needs that recognises the importance of internal as well as external means of meeting them, then we can start a process of transformation that draws us out of a narrow focus on material wealth (what we do or don't have) and instead motivates and mobilises people to use their own skills and ideas to satisfy their needs.

Designing fashion to help us flourish is extremely challenging. One project that specifically worked with Max-Neef's ideas of needs was Super Satisfiers, part of the 5 Ways project (Fletcher and Earley, 2002/3). Super Satisfier's aim was to develop a concept piece that explored the way we meet needs by converting subtle and unconscious uses of clothing into a design brief. The hope was that this would imbue a garment with meaning to try to break the cycle of consumption and dissatisfaction and in doing so make our hidden needs more obvious so that we can connect more with ourselves. The project focused on the need for affection and developed the 'caress dress' (see Figure 1); one designer's highly personal take on how she attracts attention from

others through garments. The designer noticed how she attracted more attention when she wore tactile fabrics and enjoyed the feeling of friends touching her garments. The dress uses slits and subtle cut-aways to reveal hints of bare skin at the shoulder, the waist and the small of the back. Its purpose is to invite friends to touch and embrace her and for the wearer to feel the warmth of others affection for her.

Needs and satisfiers are both complex and extremely personal. Each of our psychological needs is met in different ways and what is nurturing for one of us is frustrating for another. So if we pursue a needs-based approach to promoting sustainability, then we have to build an industry that respects - and actually finds business opportunity in meeting - our diverse, individual needs. To do this effectively, we need to recognize that products only play a partial role in meeting needs and that the majority of human well-being lies entirely outside the product world. This does not mean that products and the industrial sectors that produce them aren't part of a needs-based approach; only that they aren't all of it. There is also a key role in needs-centred design for the public sector, community groups and by fostering different types of social practices and forms of organization.

4. A new fashion ethic

What will fashion that helps us flourish be like? As hinted at above, it will have to be responsive to our diverse, individual needs. Diverse products do far more than just showcase lots of different materials, they can also sustain a sense of ourselves as human beings by being more likely to recognize a wide range of symbolic and material needs. Smaller makers with flexible and nimble production systems can produce products that are personal and specific and that are 'just right' for us. They reject homogenization and autonomy in favour of expressiveness and difference. This necessitates a different production system, one where industry is made up of 'millions of markets of dozens' (a plethora of small volume products), rather than our present day set up of 'dozens of markets of millions' (a limited number of large volume products). This more needs-friendly approach to production happens to also chime with predictions for the future of business more generally, which make use of new media and tools like the Internet to match consumer needs with specific products. This is the complete opposite of the Fordist way of doing business so dominant in the twentieth century, where a few generic products were marketed to all people.

The success of this diverse, flourishing fashion ethic will also be secured in the relationships it fosters. We will see beauty and greatness in garments that value process, participation and social integration, in pieces that advance relationships between people and the environment. The activity of friends knitting together is joyful, compostable garments are joyful, supporting a disadvantaged community with careful purchasing is joyful. Relationships can be fostered by designing garments that encourage us to ask deep questions about our sense of place in the natural world. Such garments could accomplish this by supporting our desire to ride a bike not take the car or by being sharable between friends. Sustainable fashion is about a strong and nurturing relationship between consumer and producer. It is about producing garments that start a debate, invoke a deep sense of meaning or require the user to 'finish' them with skill, imagination or flair. It is about designing confidence- and capability-inducing pieces that encourage versatility, inventiveness, personalization and individual participation.

This unorthodox agenda is a call to get 'back to roots' and in essence describes a future for sustainable fashion that *reconnects us with nature* and *with each other*. It works at many

different levels: individual and industry, emotional and material, fashion and fibre. Sustainable fashion must encourage our sense of ourselves as human beings and revitalise our relationships with others, including those who make our clothes, and so will work to counter our lack of awareness of poor working conditions, poverty wages and poor environmental standards. It will emancipate us from a submissive dependence on fashion by instead giving us the skills to creatively participate with and rework our clothes. We have to become activists, skilful producers and consumers of garments, our actions exploding some of the mystique, exclusivity and power structures of the fashion system breaking the link between fashion and material consumption and allow alternative visions of fashion's future to emerge.

To this end the work of Israeli designer Elisheva Cohen-Fried (2007) begins to show us the form that fashion designed to help us flourish can take. Her work engages the end user and embraces family participation and starts by simply asking the question: 'what makes us happy?' The responses to this question varied from: work, love, music, family, and companionship to learning new skills, putting effort into something and helping others. The work that emerges from Cohen-Fried's compassionate dialogue with users sees the role of designer devolved so that the user finishes and adapts a piece with imagination and originality. Her short jacket (see Figure 2) is designed with finger knitted extensions that the user adds to after buying the garment. Loops on the garment are strategically placed to capture the lengthening knitted pieces, and creativity is enabled through the simplest of craft techniques: finger knitting. The jacket invites the wearer to be more than a consumer of commercial products, engages them as a co-designer, adding craft and personality and gaining making skills in the process. Moreover, this creative contribution can be easily accomplished without specialized tools and even in our fast paced modern lifestyles: on the move, commuting on public transport, on a bus, a train, in a taxi…

Exploring these ideas in a different format, Cohen-Fried also developed the layered capelet (see Figure 3). Here the designer's focus was on enabling the end wearer to contribute to the continuing design of the garment with family participation. The capelet is designed to be manipulated by the simplest of craft skills possible by a small child; cutting with scissors. Made from non-fraying fabric, the top layer is constructed to allow easy access and to be cut away to show the colored fabric below. The more the fabric is cut into, the greater the visual reward, as flashes of bright colored under-layer are revealed. Joyful and easily accomplished, this garment nurtures shared creativity between parent and child and captures the memory of playing and crafting together. When worn, the pleasure of co-creation, accomplishment is experienced over and again, deepening the joy of making and encouraging story telling of the experience. Imbued with deep and personal meaning these garments reject the manufactured commercialized illusions of status and self worth. Instead, they celebrate unique, authentic self-expression and open up possibilities for nurturing us, our families, our communities and our world.

These garments show that needs-centred design challenges the rhythms of fashion as well as fashion processes and finished products. Indeed it is these economic, strategic and business rhythms that are perhaps the greatest barrier to more sustainable change. They are also the area where designers have, historically in any case, least interest in working. Yet in order for 'flourishing' to be a genuine alternative to the addictive and destructive fashion industry, it is vital that wide-ranging economic and business questions are addressed. Our next step – and a huge challenge for all of us – is to move out of the 'safe' sustainability territory of small makers and 'slow' production and begin to explore what needs might mean for the large-scale rapid fashion rhythms of the high street. Yet for development practitioner Nabeel Hamdi (2004, xix), 'going to scale' with these ideas requires, paradoxically, that we start small: 'in order to do something big… one starts with something small and one starts with where it counts'. Therefore in the best tradition of Hamdi, giving form to flourishing in a fashion context requires that we design small, simple, local elements. Yet we do so with an awareness of the larger framework

constantly alert to the ‘emergent’ or ‘multiplication’ potential of these small changes. Our task is to design for, and notice when, one plus one adds up to more than two.

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Fig. 1: Caress Dress produced as part of the 5 Ways Project.
Image courtesy of Kate Fletcher and Becky Earley. Photography: Becky Earley.

Fig. 2: Short jacked with finger knitted detail by Elisheva Cohen-Fried. Image courtesy of Elisheva Cohen-Fried. Photography: Pablo Wilson.

Fig. 3: Layered capelet by Elisheva Cohen-Fried.
Image courtesy of Elisheva Cohen-Fried. Photography: Pablo Wilson.

Changing the change
DESIGN VISIONS PROPOSALS AND TOOLS

The Melbourne 2032 project:

Design-visions as a mechanism for (sustainable) paradigm change.

Chris Ryan[1]

Abstract

Climate change presents a truly challenging task for government: to decide how best to stimulate and manage restructuring, to change the trajectory of development, without loosing political support.

This is the context of a new research and visioning project in Australia known as the Victorian Eco-Innovation Lab (VEIL). Eco-innovation is taken as encompassing technology, lifestyles, infrastructure and the organisation of systems of production and consumption. The project enlists an extensive network of designers, researchers, government policy advisors and hundreds of design students in four universities. One focus is the re-envisaging of Melbourne in 2032.

VEIL is a 'vision-agent' for change, describing possible new trajectories and configurations systems of production and consumption for a sustainable Melbourne.

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Changing the world as we used to know it.

We stand at a unique point in human history, when the compelling need for radical social and technical change for a sustainable future is placing new demands on design, transforming and expanding its role from the *(re)construction* of the world, to its *(re)invention*.

The 'reality' of climate change – the scientific data, media attention and the community response – has altered the political dynamic for action to reduce greenhouse gas production. This changed dynamic is exquisitely clear when viewed from Australia because it has been instrumental in the defeat, late last year, of a conservative national government. That government, for almost a decade, had portrayed climate change as either a sinister fraud or diabolical choice that faced Australians: take action on climate change ***or*** continue to have a thriving economy. Behind such fear campaigns lay the harsh economic reality of a country that has been – literally – structured around plentiful and cheap supplies of fossil fuels, significant in their own right as exports, but also as an essential subsidy for the export of other raw materials and produce. However, in spite of that entrenched power and the years of dismissive rhetoric from Federal government leaders, climate change became one of the top three issues in the election. The new government proclaimed the ratification of the Kyoto agreement, named a minister for climate change and sent a large delegation, including the new prime minister, to the Bali Climate Change convention, all within its first weeks of office.

In Australia, as across much of the industrialised world, there are policies and programs which aim to 'carbon-down' economies. Over 200 cities and towns have committed to a program of targeted reductions in greenhouse gases[2]. Most governments at all levels (local, state and federal) have departments of climate change and sustainability; for many climate change is now a 'whole of government' program. It seems that every day there are new announcements of companies going 'carbon-neutral'; there is even a sporting alliance of elite athletes committed to making sport carbon-neutral. Reality TV programs focus on transforming the lives of average families and celebrities by getting them to live (for a period) within a strict carbon quotient. Major business consultancy firms are recruiting to build up sustainability and carbon-auditing capabilities. Governments have set long term (2050) targets for greenhouse gas reduction. There are serious and extensive exercises to model scenarios for changes in energy production, transport, buildings and so on, to meet future targets; studies originating from governments, industry , academic researchers and community organisations.

In spite of this flurry of action, it is becoming clear that climate change presents democratic governments with a truly monumental task: *to decide how best to stimulate and manage economic restructuring, to change the trajectory of development without loosing political support.* Community concern and demands for action are one thing; channelling this concern into an agreed program of response is quite another. The great social challenge we face is not just 'how to change direction', but how garner sufficient agreement on what that direction might be.

It is in this context that a new role for design is emerging as a powerful tool for public visioning and for generating a dynamic for change. The Eco-Innovation Lab (VEIL), a government funded[3] program in Melbourne Australia, is a particular case of a more general phenomenon of

[2] Led by the International Council on Local Environmental Initiatives (www.iclei.org)
[3] By the Victorian Sustainability Fund.

using design to re-envisage the future. In its first phase VEIL is developing 'a projection' of Melbourne in 2032 (25 years from the start of the project) as a way to 'open up' public expectations about future directions for development.

There is no eco-efficiency path to a sustainable future.

What emerges from most future low-carbon scenarios (e.g. Pacala and Socolow 2004; ZeroCarbonBritain 2007) is that to achieve a serious reduction in greenhouse gas production will require restructuring systems of production and consumption, including technology, business, infrastructure and life-styles. Continuous, incremental, technological improvements (in the eco-efficiency of the existing economy) will not get us 'there'; we need *systemic change in socio-technical systems*[4].

As if finally recognising the scale of change represented by a zero/low carbon future, there is increasing rhetoric in Australia (and elsewhere) that we are heading into the *next industrial revolution*. On one hand this reflects a policy shift to 'decarbonisation' as a driver for innovation and the future economy. On the other hand, this also seems to be a comforting, but flawed, allusion for government and business, often developed from the success of the last industrial revolution - information and communications technology and the internet (ICTI). That revolution brought about a fundamental restructuring of social and technical systems - the organisation of systems of production and consumption, infrastructure and technical capacity, life-styles, behaviours and social and cultural formation. We now have an economy and a social system that would all but cease to function if ICTI were to suddenly disappear. The ICTI revolution wrought its change very quickly (compared to past industrial changes) and with little of the great social dislocation or disruption that was often predicted. So, the thinking goes, perhaps the zero/low carbon revolution will be just as easy?

There are two problems with the ICTI revolution analogy. Firstly, whilst there is strong evidence that ICTI has contributed substantially to the continued reduction in the energy intensity of the economy in industrialised countries, [for a review see Ryan 2003, Chp 7] this reduction is small compared to what we now understand as the scale necessary to avoid serious climate change. In other words, in spite of its extensive and pervasive influence, the ICTI revolution has not significantly altered the fundamental underlying structure of society and the economy derived from more than a century and a half of development based on 'inexhaustible' and 'cheap' fossil fuels. It is this *deep structure* that is now being challenged.

The second problem is about the dynamic of change; in this sense the zero/low-carbon revolution is *not* like the ICTI revolution (or any past industrial revolution). Industrial revolutions in the past have proceeded from the active development (research, innovation, investment, ownership) of a new technology (or as in the case of ICTI, a collection of technologies to *act* on information. Castells M. 2002). In those revolutions, the development and diffusion of the new technology enabled a progressive reshaping of the economy and a new future *unfolded* as a result. *In this case it is the future which is defined* (in terms of greenhouse gas targets) and technology, business, life-styles have to *unfold* in such a way as to arrive at where we need to be.

[4] Throughout modelling exercises still a predilection for technology based change. But in 'wedges analysis' (auch as that of Pacala and Socolow 2004), solutions show the need for a balance between behaviour and life-style change (reducing car usage by half, for example) and technology shifts (doubling car fuel efficiency for example).

So the challenge for government (and business and the community) is how to initiate and guide a socio-technical (industrial) revolution that will bring us to a future defined by abstract modelling of environmental conditions, in order to avoid impacts which could be truly calamitous, but which are largely still predictions from abstract scientific data.

Nothing like this has confronted human society before; it demands a level of collective intelligence, foresight and purpose and a social commitment to experimentation and change that is truly unprecedented. Agreement on direction in these circumstances is difficult enough for democracies, but the time scale for action makes this so much more of a challenge.

Climate change is closer than we think.

The economic arguments to overcome 'the greatest market failure in human history' [Sterne 2007] suggest that immediate action on reducing greenhouse gases is essential if we are to avoid the escalating costs of waiting to respond; new market mechanisms need to be in place, nationally and internationally, within a decade. Yet, even the climate science on which those estimations are made is changing rapidly and there is real concern that the time horizon for serious global impacts may be decades rather than centuries. Over the last year the concerns of climate scientists about the pace (and impact) of global warming have become more public, shifting the political and community debate in some unpredictable ways. The 'first period' of doubt about the proof of human induced climate change now seems well passed[5]. Now uncertainty and concern is focused on the significance and timing of various 'tipping point' effects, positive feedback loops within the Earth's atmospheric system, which could presage the triggering of irreversible, runaway warming. This places great doubt around the estimations of acceptable (average) temperature rise. There is recent evidence that the modelling of some critical changes in the weather system[6] has been way to 'conservative', with the observed effect sometimes decades in advance of predictions. At the same time the concentrations of greenhouse gases in the atmosphere are rising faster than had been expected.

Many governments, like many businesses, are aware of this shortening of the available response time. This just makes the shaping of a program of action all the more strategically contentious. Planning for fundamental structural change in 15-20 years challenges most established systems of management and governance. When it comes, in particular, to making decisions about new long term infrastructure, and the shape of the economy, and social organisation, this challenge can be disturbingly evident. The cultural and economic heritage of past development (investment, institutions, knowledge, cultural and social expectations, as well the physical form of the built environment) can shape patterns of responses in ways that are counterproductive or dysfunctional in the new context.

'Unlocking' the expectations of the conceptual market.

[5] if the science is not beyond all reasonable doubt then it is at least a doubt so small, with implications so significant, that no rational agency can any longer argue that we must wait for more data before acting

[6] Such as the thawing of the artic ice

The *Victorian Eco-Innovation Lab (VEIL)* is a novel experiment in changing commitments to past patterns of development, providing a mechanism for advancing social and technical innovation as a response to climate change (both mitigation and adaptation). In its mission, VEIL aims to change the 'landscape of expectations' about the future. The premise of the project is that significant and rapid change in the direction of social and technical innovation (of the scale needed to counter climate change) is difficult because it has to 'unlock' a shared commitment to an opposing market trajectory that extends beyond the present and well into the future. This landscape of expectations, in which people live out their daily lives in developed economies (and also, increasingly, in developing economies because of global communications and global business), exists as a mental 'terrain of the future' which is already laid out, if not in detail then at least as *a field of future consumption possibilities*. These possibilities exist as an ever expanding set of seductive future-products or services, projected to consumers as sophisticated *future-real* design concepts, from producers who recognise that 'exhibiting the future' has become an integral and essential part of their business strategy. This reflects a strategic shift in the locus of competition, from the here-and-now, to the *conceptual market* of the shape of things to come. As the VP for global marketing of Philips, Geert van Kuyck, says this of their ventures into the conceptual market: *"By being able to see, touch, feel, smell the future in the present - if only for a moment – our people see the world through a new set of eyes"* [Next Simplicy2007]. The 'our people' he is talking about includes both their customer base and their company designers and engineers. By focusing design on the task of bringing the future into the present - making ideas and scenarios for potential future products visible and tangible - a producer's reputation and brand identity can be enhanced, company strategy can be reinforced and the risk of market failure reduced. [Ryan 2002].

Producers and consumers have their future expectations moulded by this field of future possibilities. The conceptual power of this 'future in the present' points to an inertia in the economy which may be a significant retarding force against rapid change. It is this force that is the target of the VEIL project. From the very way that future possibilities come into being as part of the business strategies of existing companies, they are unlikely to embody aspects of radical, or systemic, change in patterns of production and consumption which would challenge the deep structure of our existing carbon based development[7]. VEIL sets out to explore the potential to intervene in the conceptual market, using the same sets of skills and techniques as that of the producers of consumer products, but from 'outside' the existing economy. The idea is to open-up 'new space for eco-innovation' (social and technical innovation directed to sustainable outcomes) by using the agency of design to create seductive, intriguing visions of future possibilities that are based on significant structural change, that embody paradigm shifts in systems of production, consumption, infrastructure and life-styles. These new future consumption possibilities emerge from 'outside' the principal social institutions of production and consumption, through a collaborative structure that encompasses a number of university design schools, bringing design academics and a large cohort of later year students into a public 'laboratory'.

Speaking of the Philips approach, Stefano Mazzano, as Chief Creative Director, refers to their use of human sciences experts as 'sensors' for new consumer demands, to provide understanding or interpretation of people's motivations. [Mazzano 2005:] VEIL is structured to approach the task or re-invention of the future in an analogous way to Philips but without the

7 Developing the VEIL project involved an extensive survey of future products from a wide range of production sectors – automobiles, white goods, domestic appliances, information technology, communications, home entertainment. Those emanating from large established – leading – producers were, predominantly, restricted to design improvements along existing and well established trajectories of innovation. In so far as they addressed the challenge of climate change and fossil fuel usage they were essentially restricted to (incremental) improvements in resource efficiency, largely staying within existing product typologies. There were new businesses and would-be entrepreneurs proposing radical alternatives, hoping to establish a new market niche with a disruptive technology or product. At the time of that investigation (2005), these alternative concepts would probably not have reached a mainstream public audience, they would have been barely visible in the field of future possibilities.

accumulated social and technical capital and commitments of a corporation; social and scientific experts come from university and government research groups as well as community organisations and NGO's. Industry is not sidelined in this process, its enormous power to bring about change is recognised; links with people within companies have been established (as they have been for government) and are expected to grow. But the aim is to engage in the conceptual market from an independent position to produce 'oriented radical innovation' [Manzini 2003] through *the co-production of an alternative future* and eventually affect strategic investment decisions in ways that may never be possible given the organisational commitments that constrain government[8] and business decisions.[9]

The project also has some funding to extend its work into the realm of professional design consultancies by acting as an 'public-interest' client for the development of sophisticated and well resolved future concepts that have been generated by VEIL[10].

The creative power of a twenty-five year perspective

It is not only the independence from dominant social and economic structures that gives the VEIL project some power to change expectations, it is also its conceptual horizon. After reviewing research on established methodologies and experience in the areas of scenario setting, foresight, social planning, technology assessment and so on, VEIL has set its initial focus on a 25 year future[11]. There are logical reasons for adopting this target, and work to date has exposed another, possibly more critical, advantage for this future time-line.

There is a climate change logic: the critical period for an organised response to climate change (mitigation and adaptation) is covered by this timescale. There is a 'realistic' logic: a 25 year horizon is far enough into the future that some significant infrastructural change is possible but it is not so far that it moves into the realm of 'invented' technology (or social movements). (Any new technology or innovation that will be significant in 25 years time will exist, at least as a working concept, in today's laboratories[12].) It is thus possible to use a network of researchers to identify emerging or incipient technology (and social trends) and to speculate on its value in 25yrs time[13]. But experience has shown there is also a logic of engagement: VEIL depends on the co-production of sustainable future visions, bringing 'design' to the centre of a process to engage students, academics researchers, government, industry, and the community in a visioning activity.

8 The most significant of these in the Australian setting is the short political – election – cycle

9 Both internal and external. E.g. : brand, history, competitive position, established partnerships, distribution networks, existing markets shareholders.

10 In retrospect not nearly enough such funding; work has proceeded to date on the basis of reduced fees for designers from design practices that see the process as a part of their own investment in socially responsible work and as a way to build knowledge in a critical arena.

11 Hence Melbourne 2032, 25 years from the launch of the project.

12 It is assumed that the same argument applies to social movements as well, although this was not formally investigated in the establishment of VEIL.

13 These arguments for the value of a 25 year perspective have been well explored in programs such as the UK DTI foresight program (http://www.foresight.gov.uk).

However, these futures intentionally challenge both 'business as usual' and 'incremental eco-efficiency' scenarios for future development, so it was unclear, when the project commenced, just how easy it would be to gain the active participation of business and government. It seems in practice that a 25 yr horizon provides a safe future space for (relatively) unfettered participation, a 'disarming' period that encourages people to 'play' without concern for their current positions and commitments. For governments, 25 years is way beyond the time-frame of most current policy commitments; for business, 25 years is outside of most current intellectual property considerations. Engagement has been easy and for the most part enthusiastic.

Ultimately, for the project, the value of a 25 yr perspective will rest on the ability to 'back-cast' from the visions of the future to identify productive new directions for shorter-term eco-innovation. This has led to the development and elaboration of aspects of the project, referred to as *revealing the present*[14], *vision driven research and innovation* and *trajectories of development*. These concepts will be examined later in this paper.

The paradigm shift to distributed systems.

Setting future horizons and overall 'sustainability targets' provides some structure for a process of future-visioning but the VEIL project revolves around the critical question posed earlier: how can one break out of current paradigmatic thinking and expectations? There is a need to ground design projections in an 'alternative logic for the process of development, to change the trajectory of how things could 'unfold'. For the VEIL project, this alternative logic revolves around the concept of *distributed systems* of production and consumption. The conceptual power of this alternative framework for future development derives from a number of interrelated factors. It is an alternative model that challenges the dominant underlying logic of economic and social development since the first industrial revolution. That past logic asserts that increasing the scale of production (and distribution) of goods is the only viable route to overcoming scarcity, to increasing human productivity, security and well-being. In that logic the spatial location of any area of production is determined only by relevant economic factors, most typically the cost of labour. Distributed systems, in the sense that it is used in this context, presents an alternative model for the economy and well-being, based on *networked small(er) scale systems of production and consumption* that are *re-localised*, so that they utilise regional resources, increase diversity of productive cultures and goods and services, strengthen communities and increase socio-technical innovation[15]. Distributed systems, in this sense, are part of a rich intellectual history of ideas in political economy (often couched in terms such as *self-sufficiency*, *decentralisation*, *local self management* and so on), from the anarchist and utopian socialist movements to its more recent incarnation in the early 1970's in the response to 'Limits to Growth' [Meadows et al 1972] and 'Small is Beautiful' [Schumacher, E.F 1973; 1999]. However, whilst that history provides a rich territory of ideas to explore, the dominant social perspective today is that the weight of historical development and the formation of global capital

[14] A term developed by one of the VEIL researchers, Ferne Edwards, when talking of the Melbourne 2008 Food (production) Map which is part of the project's research.

[15] This echoes the arguments of the Distributed Economy Labs in Sweden that a distributed systems approach will 'open up new possibilities for innovations, increased regional entrepreneurship and viable solutions for sustainable development' [www.DELabs.org].

has largely rendered such ideas obsolete[16]. This makes engagement with the alternative model quite difficult.

There are countervailing factors, however, that make the concept easier to consider. There is the technological success of the ICTI revolution which has established an infrastructure based on a model of decentralised, networked, production, distribution and consumption of information. The internet thus provides a recognisable and well understood alternative structure for the organisation of systems of production and consumption. So it becomes a reasonable proposition to ask whether that model has wider applicability than the field of information. This is not such a difficult question because there is another critical area of technological change where distributed systems are delivering increased efficiency, lower greenhouse gas production and economic success: *renewable energy*. The idea of distributed energy production from wind, solar, geothermal, combined heat and power, and so on, connected to 'the grid' is well understood. Such a system is almost technologically determined because of the distributed nature of the energy resources being tapped. But it is often more efficient, reducing losses in distribution because production and consumption is (on average) more localised. In such a system the grid can be thought of as a 'load-sharing' network, providing for any shortfall in local production and distributing excess where local conditions provide for it.

In Australia the distributed systems case is made easier because it is also observable in the provision of water as the country adjusts to almost a decade of drought[17]. The 'old' paradigm of large scale rainwater collection systems based on river catchments and dams is being replaced by what could be termed Water Sensitive Systems Design (WSSD). WSSD involves retaining rainwater where it falls and connecting it to appropriate local use. This incorporates a change in the relationship to the 'grid connected' supply from catchments; freshwater consumption is reduced by use of retained rainwater and the treatment of waste water at various local scales. The old engineering classification of water into separate 'classes' with separate engineering systems[18] is giving way to a more complex eco-systems approach where appropriate supply (quality and quantity) is matched to appropriate use, with the least movement of water. The most successful large scale project derived from the WSSD approach and VEIL workshops on distributed water systems for Melbourne 2032, is a Melbourne City Council project called 'Melbourne as Catchment' which aims at a dramatic reduction in the city's demands for reticulated water by the utilisation of all rainfall and waste water streams available to the city.

Resilience as a focus for eco-innovation.

The distributed model for water and renewable energy is a response to climate change, bringing together both dimensions of 'response': 'mitigation' and 'adaptation'; this is central to the VEIL scenario for Melbourne 2032. Action to reduce greenhouse gasses will need to be accompanied by other action to protect society against the impacts of climate change which will clearly be manifest for a very long time, regardless of the global success in decarbonising economies. WSSD is an example of such an adaptive response because drought is considered to be a product of climate change; modelling suggests that there is a very high likelihood that

[16] In spite of all the social and cultural dissatisfaction and opposition that attach to the 'forces of globalisation' and the products of homogeneous multi-national markets.

[17] Exacerbated by patterns of water use which have essentially been outstripping sustainable supply for a long time

[18] These used to be: *fresh* (potable) water from 'nature' (rivers and dams) – with reticulation systems; *storm* water (rain running off urban structures) – with drainage systems; *waste* water (potable water contaminated by human and industrial use) – with sewerage systems. [See Ryan 2007]

rainfall patterns of the past will never return [CSIRO 2008]. However a change in average rainfall is not the only outcome of such models, they also predict an increase in 'heavy' rainfall days. Extreme weather events are predicted to increase – heat, cold, fire, drought, flood, storms. Each year there are significant examples of such events that challenge the security of old patterns of infrastructure. The VEIL positioning document – "Melbourne 2032; Looking back" [19] – says this about the dynamics of current conditions:

> *The persistent and devastating drought in the first decade of the century increased the community's sense of vulnerability as past investment in water-hungry systems proved to be a barrier to adapting to changed conditions. This problem was evident in so many critical areas of life, from agriculture and food, to parks and home gardens, building systems, bathrooms, kitchens, laundry and sewage. Big engineering solutions such as desalination plants introduced new dependencies and vulnerabilities when supplies were disrupted through technical and other failures. Large systems created large vulnerabilities.*

Melbourne has suffered disruption of electricity supply and blackouts when unusually hot summer weather increased the load from high air-conditioning usage at the same time as a severe shortage of (cooling) water reduced the capacity of (coal-fired) power stations. National electricity supply has been disrupted by severe forest fires raging in the vicinity of the main national transmission lines. When effects such as these coincide then disruption can be significant and painful for the population. Floods are causing immense damage to residential and farming communities[20]. Reducing such vulnerabilities is becoming a focus for planning and design.

The VEIL approach to future visioning sets *resilience*[21] as a high priority, proposing distributed systems and diversity as a model for increasing the resilience of urban life. The structure of the internet was a response to concerns about securing information against deliberate attack. Water and energy, even more fundamental for human existence than information, require delivery systems resilient against all forms of disruption, including changing climatic conditions and events. Networked, localised and diverse systems of production and consumption becomes a conceptual framework for designing resilient systems in a structural sense, but also in a social sense, offering a way to strengthen community connection and diversity without increasing insularity or inequality (often a criticism of regional or local self-sufficiency). In the VEIL work up to now this resilience-design approach has brought into to focus another dimension of resource provision: *food*.

A retrospective history of the next 25 years.

[19] Available from www.ecoinnovationlab.com/library

[20] Other impacts have been felt as well. A banana drought was caused by a cyclone in the banana growing area where storms had not before been part of the weather pattern. Bananas were almost absent from the market for several years.

[21] in its simplest terms, the ability of a system to recover from shock.

The VEIL project commenced in February 2007 with a one week-long workshop for around 45 people. The task was to draw a wide group of people into the process of re-inventing and (re)visioning the future, around the distributed systems paradigm. A literary device was developed to assist the workshop participants (re)think about the form of the future. Through this device, the VEIL program writes the history of change from the position of the future. The positioning document "Melbourne 2032 –looking back over the last 25 years[22]" introduced participants to a specially framed set of 'drivers' of change which were depicted as shaping the unfolding future from 2007-2032. Although drivers of change are described in the document in some detail, the resulting shift or transformation of the fabric of Melbourne is not described; it deliberately leaves 'open' the resultant physical and organisational outcomes of the forces described. Visioning is then a creative task of exploring (many) possible configurations of daily life ('possible worlds' in the terms of Manzini and Jegou 2003) that could have resulted from such forces. The task asked for descriptions of people lives and also of the world in which those lives were lived. More importantly the 'drivers of change' carefully avoided introducing events that would stretch the readers own sense of plausibility; although the future might be open to invention, the forces of change were carefully not invented but relied on the plausible future evolution of dynamics of change (technology, resource costs, weather patterns, social and behavioural interests and actions) that are observable in some emerging form today. In the process used for the workshop, ideas and discussions recorded over a day were taken as the vision-field for designers who then turned them, over a five day atelier, into visible and plausible images and life-narratives[23] that give 'glimpses' of the future. These were presented back to the whole workshop group for another day of discussion and elaboration.

This idea of *testable plausibility* has been critical to selecting glimpses of the future and what we call *trajectories of development* (which describe the way the envisaged future might have taken shape). *Food* was the catalyst for these ideas.

Distributed food production and consumption

Food, energy and water are the fundamental resources for all living systems. In human society the production of food depends, directly and indirectly, on the organisation of energy and water systems. Any change in the latter will impact on the systems for producing the former; the 'embodied' energy and water of foodstuff will cause the cost of food to rise as the price of energy and water rises due to carbon taxes and supply shortages. Extreme weather events threaten the security of food supply particularly if the concentration of agriculture into large monocultures continues[24] and the biodiversity of food species continues to reduce. Changes in energy supply could disrupt food distribution, processing and storage[25]. There is already evidence of social unease about the food system from a range of new 'consumer movements' which challenge established patterns of consumption: farmers markets, local consumption and distribution (low 'food miles') systems, organic food, fair trade, community assisted agriculture, and so on. All

[22] A constantly developing document - subtitled: "the dynamics of change and the impacts of various policy approaches; learning from the revolution of the last 25 years".

[23] A term developed by one of the VEIL team, Dianne Moy, to describe a range of communication devices through which the lives of individuals and communities, including their interactions with the systems and infrastructure that make those lives possible, are conveyed to the observer.

[24] A recent VEIL report for government documents all the threats to the security of the food system from environmental change: See Larsen, K., Ryan C., Ambrahams, A 2008.

[25] For a range of foodstuff the energy inputs are concentrated in transport, processing and preservation, i.e. are post farm, for others, resource use is principally pre farm-gate, particularly due fertiliser inputs.

these developments that could effect the trajectory of future food systems were brought out in the first VEIL workshop which developed a strong interest in the idea of urban food production: if water and energy systems become distributed, so too would food systems. As Appendix 2A of the M2032 Looking Back report expresses it:

> *'Any analysis of the change to the city of greater Melbourne over the last 25 years would have to place the (re)emergence of urban agriculture, and the contribution to the city's total food consumption that derives from urban sources, as amongst the most significant features worthy of attention.'*

As a new metric for the city, by 2032, more than 40% of the food that Melbourne citizens consume will come from within the urban boundary. The M2032 Appendix 2A notes:

> *"The change … reflects a significant shift in private and public investment, as well as concerted community action, … it has been a serious and purposeful pattern of development. Food as part of the urban fabric is now well entrenched, enshrined in planning regulations, supported by (and supporting) new institutions and services…a use of public and private space and a vital part of the economy. It is universally accepted as necessary for the security of life in greater Melbourne."*

Trajectories of development – visualising the evolution of new systems.

The notion of urban food production is a radical and challenging idea for a city such as Melbourne, but by 2032:

> "Urban food production has grown to be a complementary part of all residential development; it is supported by (and supports) new institutions and services; it is high on the indices of 'liveability' for the city; land vacated by declining industries and unused infrastructure is first considered for its potential for food production. Local food specialisations and community food 'brands' form a culturally significant part of the diet of most Melbournians."

In 'back-casting' from that future condition to the present, the project has been able to develop visions of intermediary steps in the dynamic of change. These steps are not derived from modelling in the usual sense; they start from considering actors that will be caught up in the response to climate change as it relates to food and developing plausible responses by those actors. The actors and their roles are described in M2023 Appendix 2A along with their trajectories of development.

Individuals and communities.

Engagement in growing food increased as a product of various factors: rising food costs; an aging society and leisure (people like gardening as pastime); a response to concern over food

quality; concern about ‘food miles’; desire for more seasonal diets; ethnic populations and cultures growing ‘traditional’ herbs and spices and other regional foods; a desire to act on issues of climate change. Food growing increased in residential gardens and in communal allotments on sites made available by public authorities.

Schools

School ‘kitchen’ gardens were being established in primary schools in Melbourne in the early part of the century as part of a movement to address health and education about nutrition. Children grew food which they then consumed as part of healthy lunch-time meals. The idea spread rapidly with some funding from government and industry sponsorship until it became a norm for most schools. The school garden started to *diffuse out* into the community beyond the school. First teachers took on the role of producing seedlings at home. School garden space was often limited and children and teachers, and then parents, sought to identify additional garden opportunities. In suburban areas gardens were established near schools by using ‘nature-strips’[26] and the edges of parks. Children recruited their parents and additional plots were soon appearing in their home gardens, tended by children and their families. Fresh food was often taken from home to school in the mornings. Soon school classes took on a coordination role, tracking what was growing where using internet based systems, planning lunches around the available items and, on weekends, running small markets to sell/exchange excess foodstuff.

Local government.

Local councils respond quickly to concerns and desires of their communities. Food became a new arena for their activities and services. Programs were developed which responded to the need to deal with:

- calls for assistance to establish local ‘farmers market’s and similar food events,
- access to waste or unused land for allotment gardens and school gardens,
- advice to residents on food preservation and safety as well as horticulture.
- changing planning rules to support urban agriculture.

Addressing the issue of rising food prices led to policies and activities directed to the idea of “Free-food”. Productive landscapes of fruit and nut trees became a new organising principle for the refurbishment of parks and gardens and street plantings. Social services that revolved around food provision (meals for the elderly etc) became more targeted at supporting local food production and at the possibilities for deeper social and community engagement in food preparation. Councils became partners with commercial entities (see below) in local food depots dealing with the preservation of excess crops.

Commercial activity

Entrepreneurial small businesses moved into this new market and a number of prominent public / community activities evolved into commercial enterprises growing and processing food. Of the three commercial case studies envisioned for this process, one was a franchise service known as *Jims Urban Farming*. The ‘Jims’ service grew to prominence in the nineties with the development of a local lawn mowing service as a national franchise – Jims Mowing. In the early part of the century many residents across Melbourne found that they need to realise some of the

[26] The wide verge between the footpath and the street usually planted with lawn.

asset tied up in their homes. “Downsizing” was one option (moving to smaller units) but in most cases that required leaving established social networks as housing types in most communities were fairly homogeneous. For those living in suburban dwellings Jims Urban Farming offered an attractive alternative. It offered to lease back gardens, paying an annual fee to households to allow that space to be re-used as market gardens. Householders got increased income if they persuaded neighbours to join the system so that there was adjoining land for larger farming plots. Homeowners got an annual income but still had the visual amenity of a productive agricultural landscape. Jims only used organic practices so there was no concern about chemical use. Residents like the security of ‘farmers’ present during the day. The system evolved to incorporate options for residents to have access to the gardens, including paid work at critical production times.

Revealing the present.

Future visions which define new trajectories for development provide a ‘window’ through which to (re)view the present, to expose hitherto ‘under-recognised’ activity which is consistent with the future change. For food production and consumption a small research project and a student team[27] has been mapping existing sites of food production in urban Melbourne finding over two hundred such sites covering community gardens, small scale commercial allotments, school gardens and so on. An interactive ‘food map’ showing these sites and facilitating the collection of additional data from the community will soon be launched. Various sites around Melbourne that are well recognised take on a new purpose when viewed through this window. One such site is the community environment park known as CERES (www.ceres.org.au) which is now developing a small closed-cycle system for fish farming built by design students from RMIT University, one of the VEIL partners.

Vision driven research and innovation.

In the VEIL project the future visions are approached not as forecasting but as goals which can stimulate research and innovation projects which are vision driven. One example of such a development is a combined heat, power and water system, known as the Blue Box. In this system a gas-powered CHP unit provides around 25 kilowatts of electricity into the grid. The heat however is used to distil available waste water for uses that demand higher quality clean water. This unit uses existing technologies modified for the purpose. The business plan is for many units able to be located where waste water and gas are available, with all units connected to a central maintenance system using sensors in each Blue Box to monitor performance in real time.

Some of the vision driven research and innovation is being considered as *pre-emptive industry building*, with a focus beyond a particular product to a wider concept of the transformation, or creation of a sustainable product or service *industry*. One area being explored derives from the idea of the ‘Re-Designer’, operating in a local/regional economy, producing limited-run (differentiated) products incorporating mass-produced ‘used as-new’ components (traded internationally) with some locally produced components or sub-assemblies. Initially this

[27] Involving RMIT University landscape and industrial design students, lead by VEIL sustainable Melbourne researcher, Ferne Edwards - see ww.sustainablemelbourne.com/food

future vision for a new global-local industrial system focused on the availability of 'orphaned' components from products taken back from users, at the end of their life, under extended producer responsibility regulations. The scenario has since been extended to a more detailed projection of global-local manufacturing in 25 years time, broadly aiming for a 75% reduction of material flows in the economy. Such an idea relates to the concept of mass-customisation but transforms the way that such systems are usually conceived[28].

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[28] for further information consult the VEIL web site or email : mark.richardson@artdes.monash.edu.au

Fig. 1: Jims urban farms renew ‘old’ back gardens with a contribution to Melbourne’s food stock

Fig. 2: Melbourne then and now (2032); a diversity of local life-styles

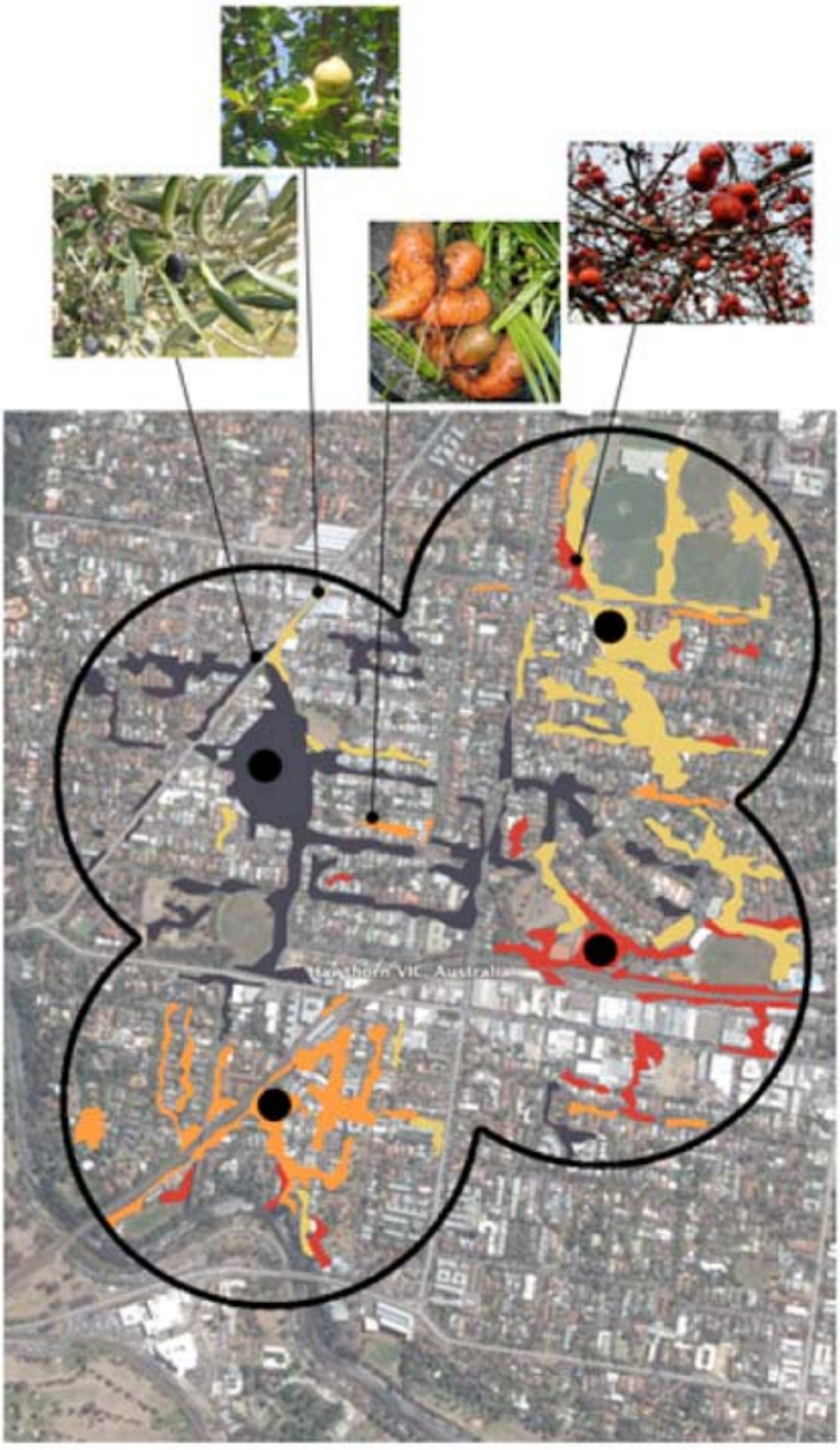

Fig. 3: Food diffuses into the web of Melbourne from School gardens