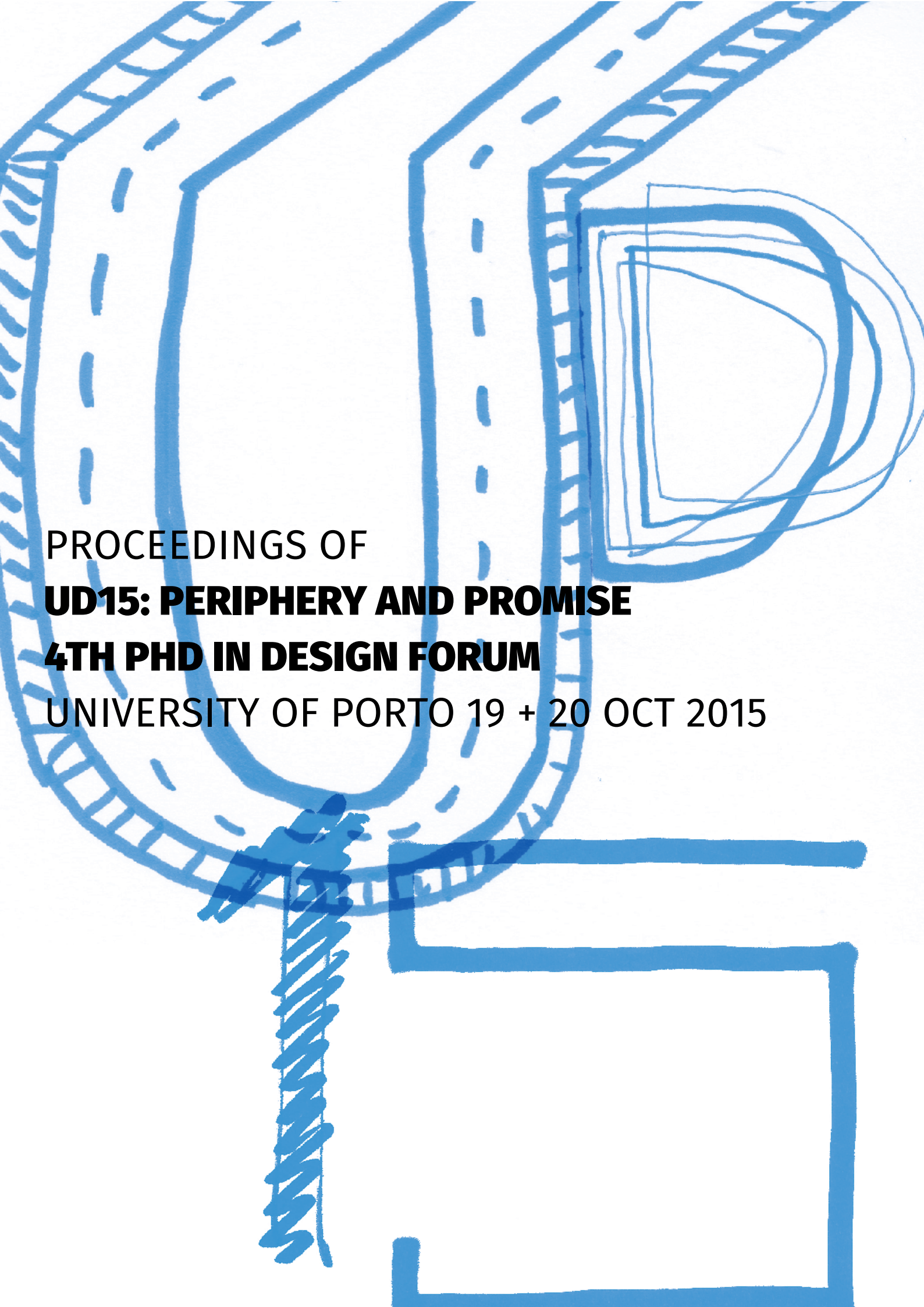

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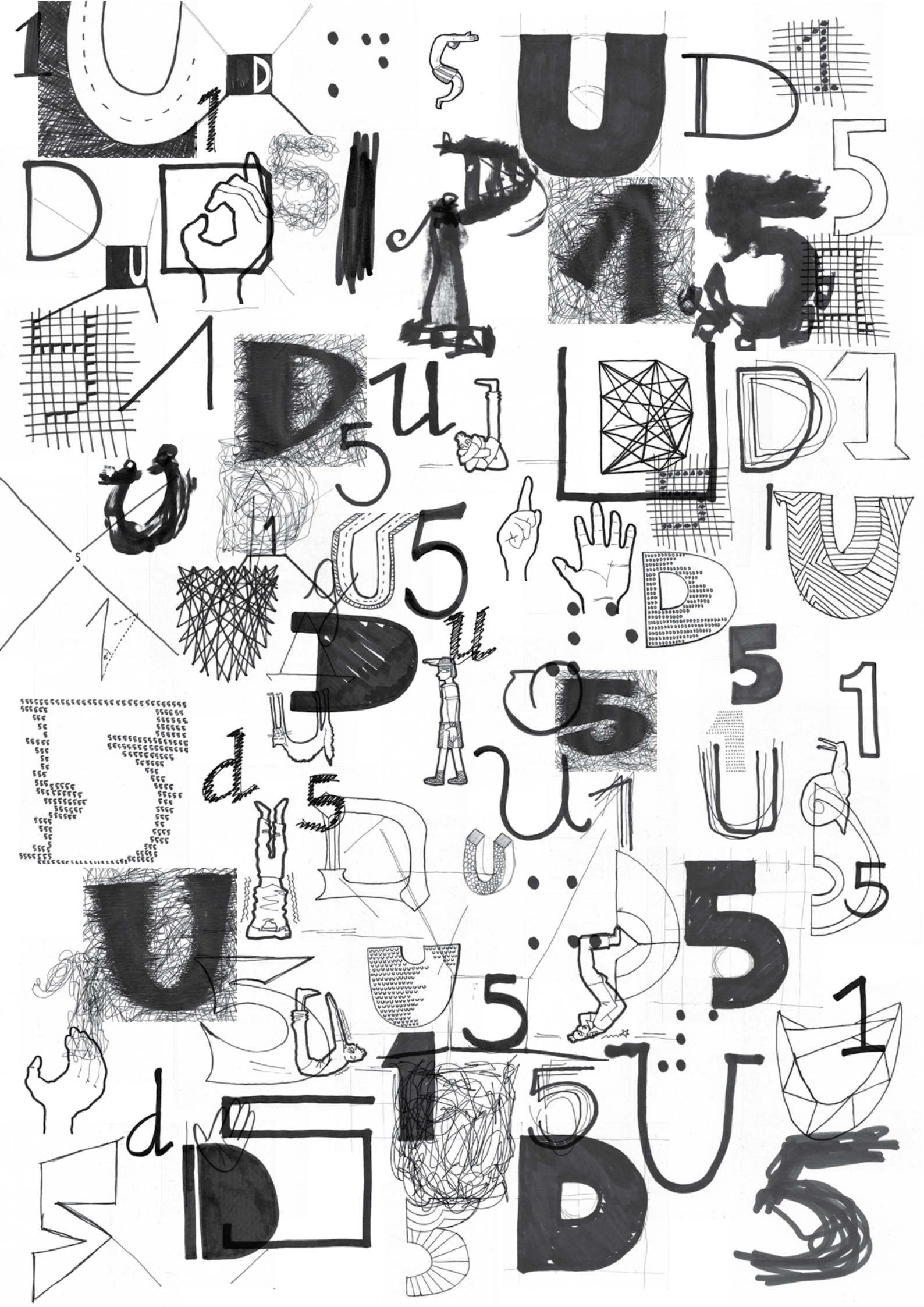

UD

IS AN ANNUAL, PEER-REVIEWED CONFERENCE SERIES ORGANISED BY THE **PHD IN DESIGN** PROGRAMS OF **UNIVERSITY OF PORTO** AND **UNIVERSITY OF AVEIRO**.

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Published in March 2016 by PhD in Design Program, Faculty of Fine Arts, University of Porto, Portugal
Edited by Ece Canli & Rita Maldonado Branco

ISBN: 978-989-98284-3-8

Proceedings PDF is available at:
http://www.ud15.org/ud15proceedings.pdf

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EDITORIAL

UD is an annual, peer-reviewed conference series organised by the PhD in Design Programs of University of Porto and University of Aveiro. Beginning in Aveiro, in 2012, as a national meet for doctoral students in design, UD has been hosted alternatively by the two partner universities every year. The scope of the conference has seen constant advancement with each iteration, and in 2014, UD at Aveiro widened its domain to students and researchers from the Iberian Peninsula. UD15, in its latest iteration and returning anew to Porto, has become the first genuinely international edition of the conference series, by opening its doors to participation from around the globe.

In the 2015 edition, UD has stood for *Under Development*, with a view to address doctoral research in design that is currently in progress or recently completed. UD15 has accordingly welcomed participation from PhD students, prospective candidates and scholars from design and related fields, and invited them to share their experience of the chaos, celebrations, failures, dilemmas and epiphanies entailing design research, towards creating a pool of common issues and inquiries which require to be resolved or embraced.

Over the course of two intensive days, UD15 has hosted researchers from all over the world including Portugal, Italy, Denmark, Netherlands, Sweden, United Kingdom, Turkey, Japan, Tunisia, Brazil, South Africa and the United States. The resultant miscellaneity of thoughts and ideas has inspired stimulating discussions and exchange of insights on the topic of design, and more. We are greatly gratified to have had the privilege of organizing this edition of the event, and we believe UD carries great potential to attain further recognition, and contribute more profoundly to the domain of doctoral research in design.

For making this event a possibility, we sincerely thank:

Our esteemed institutional partners and sponsors for their kind consideration and support;

Clara Gonçalves, Executive Director, UPTEC, and Fátima São Simão, Director, UPTEC PINC, for granting us the permission to utilize UPTEC PINC premises and various resources for the event;

Our keynote speakers, who graciously shared their knowledge and expertise, and gave pertinent feedback;

Each scientific committee member for their time and patience in reviewing and counselling the submitted papers;

All authors and participants who found relevance in UD15 as a platform to share their research work, and worked enthusiastically and determinedly during, before and after the forum;

All volunteers for their unwavering dedication and tireless support to the cause.

We hope to meet you next year at UD16 in Aveiro!

On behalf of the UD15 Organising Committee,
Ece Canli & Rita Maldonado Branco

STATEMENT

The relatively recent discipline of Design Research has rapidly established itself as a key catalyst for across-the-board progress, theoretically and practical terms, in the field of design. It invariably promises new possibilities of enhancement for the society, and its influence and impact extends to a wide variety of sectors, ranging from environment to politics, education and technology, health, communication, and daily human activities.

Nowadays it is possible to associate almost every concept related to human action with design, including better interactions, better society, new roles, further landscapes, citizenship, knowledge transmission, systems and services, sustainability, media, culture, heritage, and image production. As design research gradually opens up to new modes of living and new meanings, it spreads over uncharted territories of intervention and interference. UD15's motto – *Periphery and Promise* – is in recognition of this consecution.

Within this framework, we welcomed contributions in five separate and yet related streams, each of which dealt with issues of Periphery and Promise from the different perspectives of:

CONTEXTUALITY

This stream sought design contributions based in contextual research. Case studies can reveal the uniqueness of a given environment, just as much as they can act as templates for broader issues and methodological approaches. Participants were welcomed to present research that added to the field of contextual possibilities for design, introduced innovative methodologies to unfamiliar territories, and applied and adapted prior knowledge to new environments.

COLLECTIVITY

Despite the individual nature of PhD research, no knowledge advances on its own. How to deal with the concept of collective, both in academic environments and in outreach research activities? This stream welcomed submissions that addressed the collective aspects of design research: challenges and templates of intellectual heritage, social involvement, outreach, collaboration, communication, participation.

DISCIPLINARITY

Binding different disciplines together is a strength of design research, but this also brings complexity and entanglement into play. Here we looked for design research contributions that addressed the issue of crossing disciplinary limits: Research problems hitherto unaddressed by design research; Theories or methods inherited from other scientific areas in innovative ways; outcomes that could have significant impacts in other research fields; instances of researches collaborating closely with scientists or professionals from outside the ambit of design.

CREATIVITY

In an era beyond postmodernism and post-aesthetics, design practice is still expected to be creative, authentic and unique; on the other hand, design research as a scientific enquiry relies on successive and cumulative knowledge. This stream welcomed papers that reflected on this dilemma, and addressed the ways in which creative work can be incorporated into research, and can effectively contribute to knowledge.

PERPLEXITY

What is missing on our radar as design researchers? In this stream we pursued contributions of an exploratory nature, which proposed critical constructions, paths of enquiry and methodological approaches that are yet to be considered more broadly. What are our bigger challenges as designer-beings? What does the act of design mean to us and whom does it serves? What are the different views and opinions on the other side of design, counter design, non-design or failure of design? These were some of the questions we sought to answer.

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KEYNOTE SPEAKERS

Fading Legacy of the Macanese: An Investigation into the Symbols, Myths and Traditions

SUSANA BARRETO

Faculdade de Belas Artes da Universidade do Porto

Susana Barreto is a design educator and researcher. Having worked and lived in London and Macau for fifteen years, Susana is now living in Porto where she holds a position at the Faculty of Fine Arts, University of Porto where she is a Deputy Course Director of the PhD in Design. Susana is also a Research Associate at Central Saint Martins, University of the Arts, London where she gained her PhD and Postdoc. Susana's research interests are focused around the role of culture in graphic communication, cross-cultural design, image globalization, visual methods and design ethics.

Problemas sociais complexos: da disciplinaridade à interdisciplinaridade

LUÍS FERNANDES

Faculdade de Psicologia e de Ciências da Educação
da Universidade do Porto

Luís Fernandes has been a professor at the Faculty of Psychology and Educational Sciences, University of Porto since 1985 and currently serves as the Director of its Centre for Deviant Behaviour Sciences. He has been distinguished with the Fernand Boulan Award from the Association Internationale de Langue Française de Criminologues in 1998, and was selected as a recipient for the Teaching Excellence Award from University of Porto in 2014. His research focuses on the characterisation of issues related to narcotics in the urban context, covering a social ecology of actors and psychotropic territories. He emphasises on ethnography as his primary research method, and endorses the same to his doctoral supervisions.

Research as a symbiotic lifeform. PhD Research in Fine Arts, Media Art & Design

JAIME MUNARRIZ

Universidad Complutense de Madrid

Professor at Universidad Complutense de Madrid where he teaches Media Art and Interactive Environments, pushing digital technology in art and design studies. Deeply involved with Processing, PureData, and LibreGraphics software. Active researcher on digital art practices, he's directed theses on 3D, game art, animation, sound art, audiovisual performance, interface, video-art. Sonic & Visual artist. He explores sonic landscapes and synchronicity with visual processes, artificial lifeforms and generative image. Active in the experimental music scene since 1977.

The Craft of Collaboration and Design for Uncertainty

ANNE BODDINGTON
University of Brighton

Professor Anne Boddington is Dean of the College of Arts & Humanities. Her research interests are rooted in the design and development of the urban and cultural landscape and identity and have expanded alongside her experience in leadership and management in Higher Education. She has become increasingly involved in the strategic design and development of learning and research space and its relationships to collaborative pedagogic and research practice and to educational strategies and governance. Her current projects include entrepreneurial institutional behaviours and their impact on governance and infrastructures, the convergence of design, innovation and management as it impacts on SME's in the Creative and Cultural Industries and the nature of learning in the Museum and Higher Education sectors.

Poesis and Praxis: Eliciting Knowledge from Collective Practice

ÇİĞDEM KAYA
Istanbul Technical University

Çiğdem Kaya lives and works in Istanbul where she was born and raised. Trained as an industrial designer, she completed graduate program in fine arts in San Francisco Art Institute in the US. After her PhD, Kaya has been a full time assistant and associate professor at Istanbul Technical University (ITU) Department of Industrial Design (ID) since 2011 where she teaches interaction between art and design in the undergraduate ID program as well as product design studio; practice-led research methods and design for social innovation in the graduate ID program. Her experience as an artist enriches her teaching in the design programs. Kaya received BSc in ID from ITU, MFA in New Genres from SFAI and PhD in ID from ITU. Kaya has been a visiting researcher at Sheffield Hallam University and she is a Fulbright alumna.

Criatividade e competitividade "STEM": olhar as crises, desafiar, repensar

JOÃO PAULO QUEIROZ
Faculdade de Belas Artes da Universidade de Lisboa

João Paulo Queiroz. Doutor, Belas-Artes, Universidade de Lisboa (UL). Mestre, Communication (ISCTE). Painting degree (ESBAL). Professor at FBAUL and doctoral programs, Universidad de Sevilla. Author of high school syllabus "Drawing," national level. Book " Cativar pela imagem," FBAUL. Coordinator of the CSO International Congress (annual since 2010) and director of academic journals "Estudio," "Gama," and "Croma." Also director of the journal "Matéria-Prima." Coordinator of the International Congress Matéria-Prima, Practice of Visual Arts in Basic and Secondary Education (annual, from 2012). Member of scientific committees, assessment panels, and editorial boards. Awarded National Painting Prize by Academia Nacional de Belas-Artes in 2004.

Design boundaries in Brazilian SMEs

A case study in the furniture sector

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ABSTRACT

Most design approaches have their foundations in the United States and European western countries (e.g. Design Thinking; Design Culture, Strategic Design). When dealing with different contextual frameworks we face diverse constraints and problems as we explore the design potential in enterprises.
In this paper, we clarify some design constraints in a Brazilian enterprise through a case study, aiming to provide an initial framework for further discussion about design in this context.
We suppose that different conditions for design development in a firm, such as the lack of product strategy, portfolio development and management, commercial skills, the difficulty to reproduce design into production, and the informal way of framing its business, lead to the need of situated design practices that require design know-how.
The implementation of the new design into production and market does not rely only on “good” design practice by itself. It requires considerable effort from other areas of the company on diverse levels.

Keyword(s): Design, SMEs’ constraints, furniture sector, Brazil.

INTRODUCTION

The goal of this paper is to identify the difficulty to develop design, and to clarify the design process adopted by a small furniture company in an empirical case. Three main questions regarding many SMEs in the furniture industry are pointed out below:

1. What happens when the resources to fully develop the expected design phases are not sufficient?
2. In practice, how are adaptations done during the design process?
3. What are the main suggestions for the design process in this case?

This paper is not focused on aesthetics evaluation. In this sense, one design concern related to the firm's economic sustainability is "what is visually spectacular rather than economically significant" (Heskett, 2009, p. 83).

Heskett (2009) emphasises that "Design is about envisioning change". However, the organizational context is crucial:

> *"designers are not independent spirits, but dependent on the view of design held by management or the cultural imperatives of an organization" Heskett (2009, p. 83).*

BRAZILIAN CONTEXT

Despite the argument of globalization as a means to shrink distances and empower developing countries (Friedman, 2005), there are many constraints to be overcome in enterprises from these countries in order to achieve innovative behaviour.

Latin America presents a different historical background, technological approach, development and macroeconomic policy when compared to Europe and the USA, where most design approaches come from.

The imitation of products previously manufactured by a pioneer is a way to survive in SMEs. This behaviour can be noticed in clusters where the creation of an SME is linked with a reaction to the unemployment condition in Latin America (Altenburg et al, 1999).

The social inequalities, low quality of education and lack of management skills and knowledge are barriers to the consolidation of economic growth (ECLAC,

2015; OECD, 2014) in spite of the high craft skills identified in Latin America (Altenburg et al, 1999).

Manufacturing and services correspond to 20% of the productivity growth in Brazil. Over 80% of the added value and employment are concentrated in these sectors. The productivity growth in Brazil is associated with low added value sectors, agriculture, and mining, whereas in Asia the economic growth is based on manufacturing (OECD, 2013).

DESIGN: SUMMING UP DEFINITIONS AND POTENTIAL

We can find several design definitions (see for instance Baxter, 1998, p. 16; Bürdek, 2006; Munari, 2008; Norman, 2008; Brown, 2009, p. 16; Bonsiepe, 2011; Deserti, Rizzo, 2014), ranging from product development (Baxter, 1998) to problem solving and user-centered design (Bürdek, 2006; Bonsiepe, 2011; Munari, 2008, Brown, 2011), emotional design (Norman, 2008) and design culture (Deserti, Rizzo, 2014).

Deserti and Rizzo (2014) define design as the mediator of the production and consumption worlds. This concept refers to the design culture that relies on:

> *"... the necessity of rooting design deeply within the enterprise, which takes both a long time and the ability to adapt it to the specificity of the situation" (Deserti, Rizzo, 2014, p. 56)*

We note that **there is not a recipe for design**. It is an oriented creative process in which we use **available** know-how, knowledge, information and resources. This way, **the designer makes decisions and prioritizes according to the real conditions of each project**, adapting approaches, tools and techniques in order to reach a design that makes a difference for people and companies. It is more an overlapping process than a linear one.

According to Zurlo and Cautela (2014, p. 35):

> *"... design can be used both as an innovation tool to improve the style of a product with its minimum potentialities and as a tool to reconfigure and change the ecosystems of product-services and business models. [...] The heuristics that designers use in innovative processes can be interpreted as a mix of*

codified grammar and a series of linguistic improvisations arising from a specific context."

Design can contribute to the company in several ways and levels.

METHODOLOGY

The research strategy selected was a case study indicated in explorative studies where we deal with a contemporary phenomenon in a real context, and the boundaries between the context and the phenomenon are not clearly defined (Yin, 1994). Semi structured interviews, archives, desk research (websites, brochures) and conversations with the entrepreneur and designers were used as data collection methods. In the second phase, the designers interpreted the planned and the real design process, using as reference the double diamond model (Design Council, 2005, 2007). They could stretch and shrink the stages according to their perceived emphasis and time spent on the design process. Finally, a suggestion was provided after interpretation and analysis of the planned and accomplished design process.

THE CHAIR DESIGN: A CASE STUDY

In 2014, the entrepreneur of a small furniture factory in Minas Gerais requested a design center at a large non-profit organization that aims to support industrial development in Brazil, to make some designs suitable for their manufacturing factory. The company intended to introduce its products into a new target market for the company - restaurants and hotels - just before the World Cup in Brazil.

A senior designer was the first person who the entrepreneur met. He identified design problems referring to feasibility, ergonomics and the target market.

Two budget proposals were developed to fit the entrepreneur's conditions. It was established that just the chair would be developed, considering: (1) a more complex design than the table, (2) its market importance, and (3) its sales (e.g. the sale of seats for restaurants is greater than the sale of tables).

After the budget alterations, the team reorganized the schedule of activities aiming to find opportunities to guide the product development according to the time afforded by the available budget. The initial plan had to be revised and reduced. The planned design process is illustrated below (Figure 1):

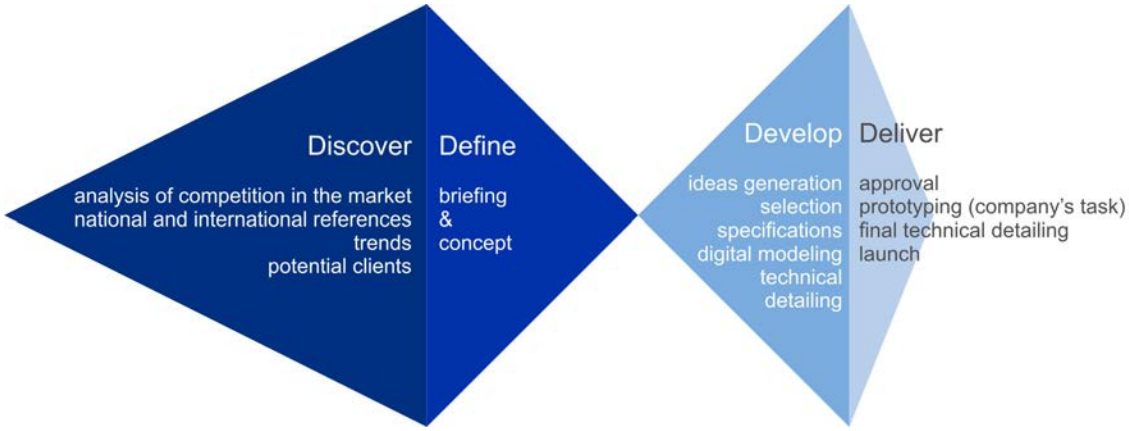

Figure 1. Divergent and convergent stages of the foreseen design process for the small Brazilian furniture company. An interpretation of the design process by designers [based on the "double diamond" model (Design Council, 2005, 2007)].

The team was composed of four designers. They considered the manufacturing possibilities through pictures of the factory, manufactured products, and store. Moreover, other questions about manufacturing processes aiming to ensure the feasibility and mobile conversations were used to get more information.

The briefing requested the development of a restaurant chair to be used in hotels. The chair should match different dinner tables. There were no more indications such as target public, market share, historical data or prior research. The specification of what range the design should reach was an important orientation. The research phase contributed to this aim. It was done mainly through websites, focusing on possible competitors and scenarios regarding the identity of the brand. Iconographic panels were also developed in order to illustrate and communicate the brand concepts. This phase was essential to better define the briefing.

The ideas generation and selection phases happened after the research phase and briefing detailing.

The final selected solution was a modular chair whose seat and back were assembling-disassembling parts, enabling the change of complements such as fabrics and materials. The design allowed different compositions that made it suitable for different interiors and situations. This strategy favours the manufacturing of different products using the same basic manufacturing processes and project.

Figure 2. 3D rendering of the proposed chair design. Reprinted with permission.

The technical detailing was delivered with additional real scale (1:1) views of the product.

In this case, the designers could not check the prototype phase, which was also reduced. This would be accomplished by the company because of the budget limitations.

Despite the fact that additional real scale views of the product and some of its parts were provided by the designers, the first prototype did not follow the design specifications and was different from the proposed product.

Figure 3: The first prototype accomplished by the company. Reprinted with permission.

Another prototype was made in the carpentry factory at the design center. One of the designers was responsible for following and checking the prototyping process. Figure 4 shows the unexpected longer lasting deliver stage, where prototyping was supported by the design staff.

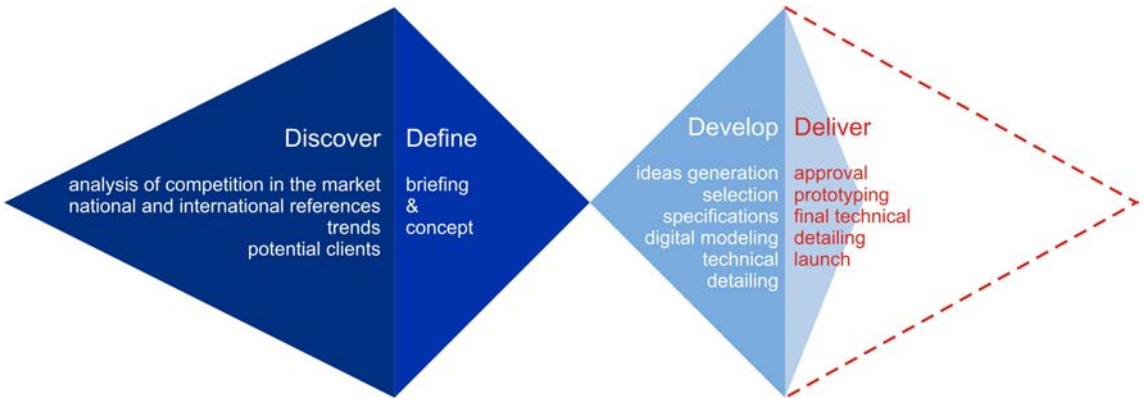

Figure 4. Divergent and convergent stages of the design process for the small Brazilian furniture company. An interpretation of the reality of the design process by designers [based on the "double diamond" model (Design Council, 2005, 2007)].

The second chair prototype was considered consistent with the proposed design.

Figure 5. The second functional prototype made by the carpentry factory of the non-profit organization where the designers worked at. Reprinted with permission.

According to the entrepreneur, another difficulty was related to commercial skills: “Now we need to deal with the trade issue. We have the product, but we do not know how to sell it.”[1]

CONCLUSION

Technical factors, such as ergonomics, design feasibility for manufacturing, and market, still matter. The company should be able to provide the proposed product, which has to be feasible and clearly present advantages compared to its competitors, presenting features consonant with the target market. In this sense, some design phases and knowledge are essential to provide guidance and better define the problems to be solved, such as:

- the market research,
- the briefing detailing,
- the knowledge about ergonomics, manufacturing processes and their possibilities,
- and the prototyping support.

[1] “Temos agora a questão comercial. Temos o produto mas não sabemos como vender.”

The technical detailing interpretation and the difficulty to establish templates for prototyping and manufacturing are still limitations on the operational level. This knowledge is not easily available, especially for SMEs that sometimes present a more informal way of framing their business (see for instance Altenburg et al, 1999).

Figure 6 illustrates the suggested design process for this case's experience regarding the importance of supporting prototyping, which was not expected by the design staff at the beginning:

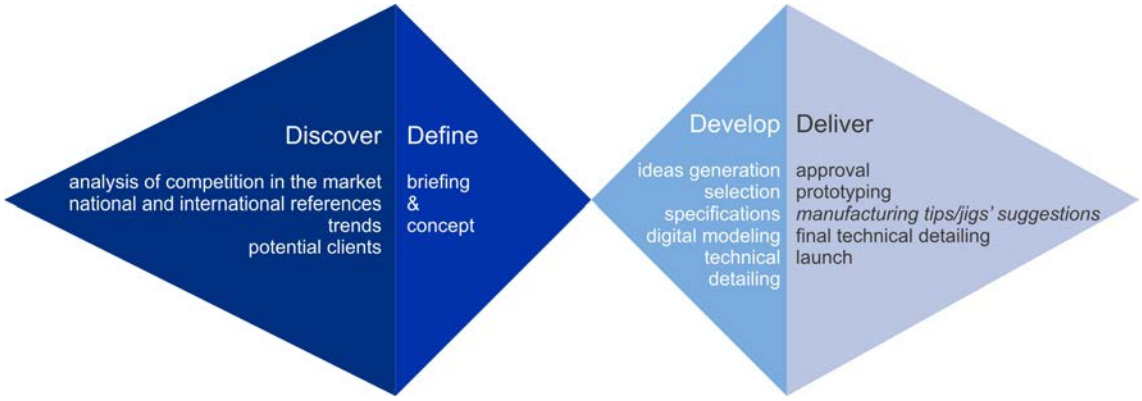

Figure 6. Divergent and convergent stages of the design process of the small Brazilian furniture company case. The design process interpretation was based on the "double diamond" model (Design Council, 2005, 2007).

The designer's know-how and interpretation used to adapt tools and techniques to the specific context are crucial in this kind of situation where we deal with scarce time and resources without interdisciplinary team cooperation, as well as company limitations on different levels, even when we are exploring the "minimum potentialities" of design.

In this case, the designer develops a lean design approach identifying the essential phases to be accomplished according to the context, creating a situated practice based on design knowledge and specialized experience (e. g. related to the furniture sector). The designer's expectations about the manufacturing high craft skills to accomplish the prototyping stage were frustrated, highlighting the need to strongly support the firm also in this phase.

From this case, we suggest the importance of mixing at least one senior designer in the design staff to contribute mainly to craft and to contextualize the design process what we named *situated design practices*.

We conclude by answering the proposed questions that synthesise the lessons learnt from this case:

1. What happens when the resources to fully develop the expected design phases are not sufficient?
The staff relies on the most experienced designers to plan the design development.

2. In practice, how are the adaptations done during the design process?
The team tries to reach a "lean" design approach, prioritizing essential activities.

3. What are the main suggestions for the design process in this case?

- To include experienced designers in the staff to drive the design process.
- To analyse the market and consumption context of the product.
- To know the manufacturing possibilities and to help the entrepreneur, providing suggestions of standard control related to the proposed design, supporting prototyping jointly with the company.

Commercial skills to insert the new product into the market are also a constraint. Moreover, we perceived that other stakeholders influence purchasing decisions, such as architects and interior designers in business-to-business transactions.

ACKNOWLEDGEMENTS

We would like to acknowledge the designers and entrepreneur who contributed to this study. This research is supported by CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico – Brazil.

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