

Trading Zones and Public Spaces Transformations the Case of Piazza Leonardo in Milan

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Abstract Starting from a real urban transformation experience related to the need to give a new life to Leonardo da Vinci Square in Milan, the paper explores the “trading zones” activated in this case where the design action is characterized by the absence of any institutional framework or mandate. In relation to such a condition, the authors discuss the nature of the design process and analyse the relevance of low structured scenarios as frameworks for activating a quasi-coordination context towards a more sustainable transformation of the square. Two main concepts are analysed: low structured scenarios as drivers (or boundary objects) for the “trading zones” enabling planning mechanisms to be created in coherence with existing forces and resources; dynamics of coordination, intended as an emerging property of decision systems when they operate within trading zones.

The paper starts introducing the conceptual interplay between trading zones and the planning of urban, public spaces transformations.

In the second part it discusses the two concepts within their specific literature domain so creating the operational framework for the description of the Leonardo da Vinci Square experience. This is then described by mapping along the time line the system of boundary objects keeping in life the specific trading zone. Each step is also analysed considering the specific coordination and alignment occurred

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among resources and actors. In particular, each step has been conceived, and/or considered, as an experiment characterized by specific conditions of governance, leadership, formal elements that this article uses as descriptors of the coordination dynamics.

Finally some conclusions are discussed and some future research paths identified.

1 Decision Making for Urban Public Spaces

A renewed interest in urban design, stressed by the call to appropriation of spaces and self activation of citizens, had focused in recent years on the creation and management of public spaces of cities. Several city authorities, at the same time, have taken and are still taking up the task of renewing, transforming, improving their public spaces as they are part of our everyday social reality. A generalized feeling on these public “objects” is that they have bear particular significance and meaning for people (Madanipour 1999).

Public spaces renewal and transformation have always been at the centre of the urban and architectural disciplines which study the city, so to represent one of the main challenging topics for urban designers. Out of the many famous squares of the urban tradition and some recent urban spaces, it is a well known issue that of the scarce liveability of many public spaces that have failed all over the world in attracting citizens, collective activities, and public lives. Some authors consider that many seem to be *intentionally designed to be looked at but not touched. They are neat, clean, and empty—as if to say, “no people, no problem!”*.¹ When a public space is empty or vandalized, this is generally an indication that something is wrong. This problem may have several origins but two are the most shared ones: it can be a consequence of its design; also the problem can be originated by the modes the space is managed. Obviously there can be a combination of these two causes. Some authors distinguish between these two problems but in our view the two problems are strictly related so suggesting to be dealt with and approached simultaneously.

In this paper we argue that some failures of public spaces can be partially explained by the gap between the design process and the transformation one. Design is often intended as a process that comes before the space transformation/management: it is an envisioning activity often propaedeutic to, and isolated from, the transformation/management so making the transformation highly risky with regards to the citizen appropriation of the new transformed public space. Such a sequence of the process may introduce a sort of indifference of the space transformation to context’s changes that may occur along the time lapse between the design and the implementation activities. The context, in our approach, is made by the evolving sum of existing resources and problems set in a given place, values and meanings associated to the space (Massey 2005), footprints of actions and uses (Amin and Thrift 2002), things that together make a “space” turn into “place” (Moro 2008). Coherently with these interpretations, this article describes an experience carried out in Milan and based on a twofold assumption: (1) the processes of public space design and transformation/management are

¹ <http://www.pps.org/reference/failedplacefeat/>.

not separated, distinguished processes; rather they are prevailing dimensions alternating each other along the same story and feeding each other towards a more stable public space configuration; (2) the resulting process can be described as a collective action characterized by the reciprocal shaping of space design and space transformation/management; it is characterized by the activation of different and ephemeral decision making spheres producing a sequence of decision steps framing the process along a coherent path.

These decision making spheres are intended as collective environments keeping spaces active, enabling space appropriation, and reducing the risk that renewed, or completely new, spaces are offered to citizens as mere platforms not recognized and/or adopted by citizens.

In order to describe processes in coherence with this perspective, and consistently with some recent literatures, authors refer to such processes as trading zones, mediation spaces for communication and interaction, where several urban actors interact and act together shaping fluid organizations that, taking in different moment responsibility of the process, make decisions towards a new and stable configuration a public space.

After discussing the potentials of trading zone framework to describe and analyze decision making processes for urban public spaces, the article applies the concept of trading zone to the case of an urban public space management/transformation in Milan. The concept is used and tested in an innovative design experiments, driven by two Universities, namely Politecnico di Milano and Università degli Studi di Milano (Longo et al. 2014; Moro et al. 2014) and aimed at capturing and observing decision making dynamics in urban public space transformation/management.

2 The Trading Zones Promise

2.1 Exploring the Concept

The concept of “trading zone” in urban studies has been introduced by Aibar and Bijker (1997), Milanovic (2006) and recently by some authors (Mantysalo et al. 2011; Balducci and Mäntysalo 2013) who further develop on Peter Galison’s term (1999), used to define the existence and, possibly the creation of intermediate spaces for communication and interaction that are to say infrastructures of shared concepts and instruments.

According to Galison, “two groups can agree on rules of exchange even if they ascribe utterly different significance to the objects being exchanged; they may even disagree on the meaning of the exchange process itself. Nonetheless, the trading partners can hammer out a local coordination, despite vast global differences. In an even more sophisticated way, cultures in interaction frequently establish contact languages, systems of discourse that can vary from the most function-specific jargons, through semispecific pidgins, to full-fledged creoles rich enough to support activities as complex as poetry and metalinguistic reflection” (Galison 1997, p. 783). It is a temporary condition for diversities to be aligned, coordinated around a very specific action or goal; Galison refers to it as “local coordination” where local stays for many contextual dimensions to be integrated. One of these dimensions is surely time: the coordination,

the alignment is not permanent, it lasts the time period through which the coordinated action is considered necessary and is implemented.

In this temporary, ephemeral coordination, each diverse actor activates a specific, diverse coherence validation with his/her own value system, which may deeply diverge from that of other involved actors. The coherence with individual value systems is also local, as it is related to the specific action and does not cover the value systems of all the actors involved. In trading zones subjects possibly act with incoherent motivations but still together around the same “doing”; here it is possible to work across groups or actors’ distances and differences; here “doing” and “acting” are the mediation entities between value systems that otherwise would rise conflict conditions or absence of communication.

In trading zones the interplay among a mix of different worldviews, value systems, and organizations is handled (Aldrich and Herker 1977) by continuously crossing the existing boundaries among those. In this sense trading zones can be considered cross-boundaries contexts where collaboration among different actors happens on the boundaries among their sectors, knowledge and organizations. In these cross-boundary contexts, the interfaces between sectors and organizations become reciprocally permeable so making specific, sectoral, organizational knowledge and resources generative of new collective learning and action throughout the innovation process.

Their cross-boundary nature makes them particularly suitable for dealing with urban problems and complexity. A relevant role in the complexity of urban systems and problems is in fact related to the difficult interaction among different organizational realities and urban actors each having different roles, routines, knowledge domains, expertise, and action fields. Ad hoc environments, being trans-boundary in the practice, are necessary for making such a richness become a collective value while creating innovation from and upon distances and diversities (Fischer 2005) rather than keeping them as separate and independent entities.

Working cross-boundaries several artefacts such as scenarios, prototypes, design drawings and other types of objects can be used to enable the interaction move towards a collective whole. The literature defines these artefacts *boundary objects*.

While the concept was initially originated referring to studies of diverse scientists, the concept has acquired a wider and more general value: as suppliers of “interpretive flexibility” boundary objects operate as supports for different kinds of mechanism like heterogeneous translations, or as knowledge integration mechanisms, mediating entities in coordination processes of experts and non-experts in many diverse interaction contexts (Worrall 2010), i.e. they enable and support trading zones conditions.

The theory of boundary objects, originally developed by Star (1990), has been applied and used to analyse and support the interactions that take place and the objects that people create and use in the context of crossing the boundaries of different organizations and communities, generically described as “social worlds” by the literature. Boundary objects can cross the boundaries between multiple and diverse social worlds as well as being used within and adapted to/by many of them at the same time (Star and Griesemer 1989, p. 408). They adapt to specific needs but are also robust enough to keep their identity across boundaries, so links between different social worlds become possible.

The concept acquired relevance in many different domains, from sociology to medical science, from information technology to architecture, and also in urban planning and design disciplines. The recognition of their relevance is not limited to them as tools, or objects, it is also a result of the richness and complexity of the social dynamics and mechanisms they activate or support when in use. Symbols, metaphors, concepts, organizations, action spheres residing on the boundary of different communities or systems can be recognized and/or used as boundary objects in many different urban experiences like public spaces, strategies, visions and scenarios, symbols and metaphors.

2.2 Coordination Dynamics in Trading Zones

In trading zones, where boundaries and meanings are fluid, emergent, and ambiguous, sort of quasi-organizations emerge and act. They can be referred to as organizations as they perform the same complex activity through the coordination of different actors. They are “quasi”-organizations because their structure is not stable, and not-even formalized or formally decided or agreed on by some or all its components. The organizations emerging in trading zones are in fact open in the sense that actors are not stable or fixed; this gives rise to sort of liquid organizational structures where even leadership roles are not permanently related to one single actor. These organizations are sort of ever-changing entities characterized by relations among actors which are evolving and dynamic themselves: the relational system of these organizations depends, in fact, on the dynamics of involved actors but also on the dynamics of the roles they play throughout the process.

Members of different communities perform cross-boundary coordination work in conditions of uncertainty, frequent changes and unclear norms. Such cross-boundary coordination practices make their work visible and legible to each other (enabling awareness of collective commitment), and that enable on-going revision and alignment. Kellogg et al. (2006) describe the involved organizations as experimenting with dynamic strategies of “continuous morphing” (Rindova and Kotha 2001, as quoted by Kellogg et al. 2006) and “permanently beta” (Neff and Stark 2003, as quoted by Kellogg et al.), and forms of organizing that are more open, interconnected, and adaptive (Ciborra 1996; Wittel et al. 2002 as quoted by Kellogg et al. 2006).

By engaging in these practices, members enact a coordination structure that affords cross-boundary coordination while facilitating reciprocal adaptability and learning.

The coordinated evolution of these organizations is assured by the temporal balance, also spatial and situational balance, between two different kinds of coordination: a vertical kind and a horizontal kind of coordination. Referring to the Oxford definitions the vertical kind of coordination is realized when “the organization of the different elements of a complex body or activity is accomplished so as to enable them to work together effectively; differently a horizontal kind of cooperation is attained when a “cooperative effort results in an effective relationship”.

Decision making organizations emerging in trading zones make use of both kinds of coordination through the construction of shared commitments (common ground, common knowledge, common activities) and the use of various cross-boundary mechanisms (e.g., routines, languages, stories, repositories, and models). Developing these

shared commitments and mechanisms requires boundary objects as able to create an opportunity field where value, cultural, languages, or principles distances and differences are not impeding, although temporarily, collective actions; actions here become collective as result of a shared commitment. The structure of the resulting organization is strongly dependent on the action process and on the roles to be played by those actors being available along the circumstances.

2.3 Potentials for Public Spaces Transformation

The perspectives of trading zones related organizations and activities appeared very promising for being transferred to collective decision making for public spaces. As we have already discussed, such processes, in order to guarantee people be the owner of the public space, require the interaction of different and distant communities that hardly can cooperate. The activation of a trading zone, wherever it can be the result of a dedicated and specific intentionality, requires the existence of lightly structured conditions, characterized by very low level of planning formalities and by the availability of main actors to keep the gates of the game open.

Applied to decision making for public spaces, the concept of trading zones appears very promising as it widens:

- the feasibility of an effective spatial transformation;
- the enrichment of the meanings associated to action-transformation of the space as people become space owners;
- the testing and discovery of new forms of cooperation each associated with segments of strategic alliances between some of actors at a time, taking care of the strategic value of the general aim.

In this paper our attention is focussed on the importance of boundary objects to activate and keep alive trading zones for decision making related to public space. In order to be activators of trading zones in urban transformation processes, boundary objects are needed to provide practical, political means for bridging boundaries among the different communities and organizations involved; establishing a shared syntax for representing differences and dependencies at the boundary inside the action environment; furnishing ways for individuals to learn about each others' differences in conceiving the space and dependencies when acting in the space; finally facilitating a process of transforming localized knowledge into novel jointly produced knowledge specific to the place and its functions and use.

Important in this perspective is the fact that a public space, being public, belonging to every body but nobody specific, being the object of many, diverse possible interpretations in terms of use and value, is itself a powerful boundary object. Being open to many possible interpretations a public space does not inhibit the coexistence of aligned, although different, motivations to act and produce the space itself. One transformation can be the integrated response to different needs and visions; acting to make and achieve that transformation, can represent the shared commitment that is necessary for the creation of a trading zone.

3 The Leonardo da Vinci Square Experience

3.1 The Environment for a Trading Zone

Piazza Leonardo da Vinci is an important and well known public space located in the heart of the “Città Studi” neighbourhood, in front of the university campus, and having the seat of the Rector of the Politecnico di Milano by one side and the “Leonardo da Vinci” primary school, one of the largest in Milan with more than 800 children, by the other. The square is the meeting point for symbolic and daily-life activities, in particular it is used and lived by the residents of the neighbourhood and by people attending the two universities. A place where multiple uses coexist in the public space, diverse, possibly conflicting, cultural codes confront with each other like students and residents, motorists and pedestrians, dog owners and kids who use the lawns in good seasons, homeless and elderly, children and adolescents.

The square was constructed at the end of 19th century as a decorative (monumental) and vehicular access to the Politecnico and then it became a car parking and garden area, losing, with the time its precise image and identity: the space has been filled in with urban furniture, now obsolete and abandoned. The low level of maintenance of the square, the savage occupation by the cars and the neglect of public space are negative elements perceived by students, neighbours, local government and universities.

The “Città Studi” Sustainable Campus Project² is the wider framework under which planners and designers worked on the requalification of the square inside a working group made also of citizens, local organizations and local agencies.

The main idea used to handle the process is that of an *open master plan*, i.e. a master plan for the square that never crystalizes rather evolves along the decision making process. One of the main features of the master plan is that it does not assume a univocal configuration nor it is a simplified representation. It is rather made up of multiple, diverse representations and definitions each created in relation to a specific time period, for a specific theme/problem, by, or in collaboration with, a specific cloud of actors. These representations mutate and are replaced by others as the process evolves, and they constitute a system that is fluid and open while simultaneously being comprehensible and persistent. The concept of an *open master plan* represents a sort of framework, better a framework boundary object, for the further definition of a sequence of *boundary objects*, more operational, that, introduced during the process, characterize some relevant turning points of the process itself. These had often the form of low structured scenarios indicating the direction, or the driving concept of the process. This approach represented a sort of *coordination* strategy, a way in which various actors, representing existing forces and interests, could align themselves towards a collective operational dimension, the trading zone, born throughout the interaction, through the exploitation of existing energies and resources.

² “Città Studi” Sustainable Campus is an open and volunteer initiative lead by two Universities, linked to the wider international sustainable campus net. It focuses on the sustainability of both the campus and the surrounding neighbourhood; involves professors, researchers and students who develop innovation approaches in several disciplines.

How the ideation-design-transformation process worked out as the activation of a trading zone? The following paragraph first describes the process through a decision phasing through the identification of:

- *boundary objects* What boundary objects are captured or created in the process and how they have worked in relation with the production of low structured scenario and sharing of common languages?
- *actors and rules* What organizational structures, roles of actors, and relations between institutional and informal actors have been generated? The answer to this question is developed with a focus on the interplay between hierarchic decisional structures and horizontal (distributed) ones.

3.2 Process Phases and Decision Progress

We provide here a narrative frame of the Leonardo da Vinci Square experience which is developed through a set of boundary objects (mainly of the kind of low structured scenarios) produced in the different phases of the process. Six phases can be recognized.

1. Preliminary phase “Setting the context”

The starting point of this narration of the process corresponds to the end of 2011, when local stakeholders and inhabitants met several times under the guidance of some of the responsible people of the Sustainable Campus initiative. These meetings represented main tools and spaces of interaction with local actors in the initial trigger phase. It started as a traditional tool for planning and participatory processes also emphasising the light formalization and the voluntary nature of participation and action by local politicians and academics. The meetings focussed on many of the neighbourhood problems and identified the square as a key focus to explore opportunities for a wide cooperation to face its urban quality and congestion issues, and, at the same time, to enhance its potentials as a flexible and multiple usable space. Informal uses, often episodic, where in some case implementing and acquiring a certain regularity so that it seemed possible to define a rhythm of specific actions or uses alternative to the prevailing parking function. The meetings started to activate a sort of scenario – an image of a *neglected whilst resourceful square* still rich of explorable opportunities, gaining attention and consideration by the institutions and the local communities,

Some meetings, also involving managers (technicians) of the city municipality and some politicians of the Neighbourhood Council, were dedicated to discuss recent experiences of public space transformations all over the world so to help the creation of a common language and shared horizon.

2. The activation and trigger phase

In the summer 2012, the process was quickly accelerated and centralized: the idea of making the square a pedestrian area became shared and evident. The circulating idea of a neglected but highly potential public space brought to a formal request, made by Politecnico di Milano to the Central Municipality, to launch a co-design process

devoted to the Neighbourhood and to the requalification of Leonardo da Vinci Square in particular, as a public and pedestrian place. Here the boundary dimension of the scenario-slogan “*experimenting the urban*” was supported by a technical work-team: it worked in order to analyse the feasibility of the transformation. A quite large number of technicians of the Municipality were involved, called from the different areas of planning (infrastructure and mobility, green areas and sports, etc.), with the constant support of the Municipality. In this phase, the academic group drew many technical and thematic studies of the area and produced a document containing general guidelines for the transformation targeting the idea of an *experiment of urban transformation* and of cooperation among different public institutions and the city at all levels of the process and of the project. In this document the idea of “*experimenting the urban/experimenting the square*”, suggesting approaches to design the transformation of this public space in real time—i.e. while experimenting the transformation itself, fitted the condition of a small budget for the implementation. The decision not to propose a final and traditional outline or sketch of the square was made by the Politecnico di Milano in accordance with the decision makers of the Neighbourhood Council in order to keep the design activity open and growing with the process itself.

It was from this moment on and through/thanks to this stance on the approach, which surely implied a renounce to some authorship, that it became possible to shape a proposal capable to involve and commit stakeholders, concrete ideas, expectations, gradually following through the process towards an effective and efficient result of the rehabilitation of the square.

3. The conceptualization and call to action phase

In the third phase, from the end of 2012 to spring 2013, many associations and stakeholders, were involved: their interests were solicited towards experimental and testing activities using the “grip” and the tolerance of the space. A wide communication and engagement plan was developed under the slogan “*riconquistaMi*” which in Italian stands for Re-Conquer Me (“MI”, that is also the abbreviation of Milan) supported by a blog and a facebook page.

In this phase the boundary object, that is suggesting the “recapture” of the space, was strong enough to align many actors’ intentions since it represented for each of them a different opportunity and meaning of expression or reclaim. In this sort of “open call” phase the whole initiative gained the attention from the internal actors already involved in the process but also by many new ones who joined the process attracted by this specific initiative.

A calendar of inter-related initiatives shared among all the actors represented the main operation to design collectively the uses and activities in the square: from dancing events to installation initiatives, from theatre performances to university workshops, everything making the whole process stronger. This phase was quite quick and took few months.

4. The experimental phase: subtracting and filling the emptiness

At a given moment, the Neighbourhood Council—after a public presentation of the project made by the university group, voted in favour of making the square pedestrian.

The decision was also shared by the Municipality few weeks later: the square became a pedestrian area on 2nd June 2013. The technical discussion in this phase focussed on the idea of *design by subtraction*: the idea was to eliminate the conditions that impeded the collective and public use of the space, i.e. to delete or (re)locate the street furniture, make surfaces and soils safe to the pedestrian, and block the access to cars.

At the same time, in order to replace the parking lot a rich program of activities organized by citizens and local associations was developed aimed at producing new forms of temporary, or gradually permanent, uses of the square for which different levels of agreement and partial cooperation are also experimented and used.

Some initial symbolic experimental initiatives (such as “Porta le Margherite in piazza Leonardo”, and “StormoRevolution”) did not even require high financial costs. Some other temporary initiatives required a light protocol and formal approval, even though some administrative steps and requests have been made to the Municipality in terms of permission for public space occupation.

This step also included the implementation of the RiconquistaMi agenda elaborated along the previous phase and the activation of a new initiative MiMuovo. This required a formal agreement, the very first one of the whole process, between Politecnico di Milano and the Neighbourhood Council. The agreement is surely innovative considering the traditional ways to manage and use public spaces. In a sense, this agreement represents an experiment itself: it looks at the two institutions, despite various past disagreements, as protagonists of the use and cure of this public space. Parallel to the formal agreement—the MiMuovo initiative, lead by the Municipal Chancellor delegated to sport services and involving from three to five sport activities per day for 2 months, was promoted by the central Municipality with IRS Institute of Social Research and planned to be implemented in two public spaces, one is the Leonardo da Vinci square. This perfectly fit with the agreement which identifies the square as a place for experimenting new activities but also operational collaboration among institutions.

During this phase the main general boundary objects is the “return-to-people space” itself, with its openness to new uses and actions that for us is still represented by the RiconquistaMi idea and laboratory. The main features of the implemented initiatives are the lightness of the transformations and their temporariness. By the point of view of formality, several other agreements were required even really sporadic and partial, i.e. made by a segment of few involved actors and referred to specific activities.

All together, events and initiatives gradually created a very different image of the square, replacing the one of a car-parking area in degraded conditions.

5. Consultation and engagement phase: the university-city call to action

With the end of activities and events, the expectation about the future of the square grew, since it was perceived as a much more hospitable and sociable space. This created a strong call to action and improvement of the “empty” space. In spring 2014, an additional step overcame the inertia of the two mostly involved institutions (namely the Politecnico di Milano and the Neighbourhood Council). The Politecnico di Milano matured a real interest in becoming responsible of the management and care of the square. A document containing “guide lines” for the square design became an instrument of coordination of the many technical fragmented skills generally supposed to cope and collaborate for the requalification of a public space. The guide lines worked

as a tool to align many rationalities, intentions and resources (material and immaterial) to work incrementally towards urban space transformation as the sedimentation of experimental uses and practices, strengthening the idea of an open and learning attitude towards spatial transformation/management. The main principle capable to keep variable intentions and rationalities together was the frequently affirmed idea of Leonardo da Vinci square as a collaboration, interaction and interchange space between two separate worlds: the university and the city.³ This vision represented a quite general, but extremely strong, boundary object capable to deal with conflicts both inside and between institutions. The focus was on the general missions of two public institutions and on their specific interests in public spaces regeneration.

6. The institutional agreement and traditional design phase

The most recent phase, ended up in October 2015, was driven by a group of technicians and politicians. The phase assumed a more traditional form of public space design as it was coordinated by the Milan municipality, supported by technical experts of the Politecnico di Milano (an architect in charge of the drawing activity, an urban designer who followed the whole process since its beginning in 2011, and also some lawyers for the writing of the agreement, etc.), and actively participated by some political representatives of the Neighbourhood Council. The aim of the phase was to develop a shared layout of a transformative intervention for the square keeping the space as much flexible as possible to be open to further experiments for public space uses and functions. In this phase, an agreement was also developed between the Municipality and the Politecnico di Milano to share duties and costs of the square transformation and management. The agreement also includes “Guide Lines for the square uses”, an innovative light protocol for the occupation of the public space suitable for other institutions and for actors such as associations, companies or citizens as well to keep the experimental and livable atmosphere of the square. Transformation works in the square started last October 19th.

3.3 Mapping Boundary Objects along process phases

Initially every actor joined voluntarily the project. The Sustainable Campus is an academic voluntary initiative that, collecting some local needs and opportunities, opened up the reflection upon the square. The working group, made of experts and researchers, was sponsored by independent academic programs on innovation in design process for public space.⁴ Neighbourhood Council representatives and citizens participated for general and personal interests to the meeting initiatives promoted by the Sustainable

³ The main principle written in the documents which has become a shared idea between institutions stated that: “Piazza Leonardo da Vinci rappresenta uno spazio di grande interesse sul quale investire per realizzare un luogo di incontro e di sperimentazione di forme di cooperazione tra Città e Università nell’ottica dell’aumento della qualità dello spazio pubblico, del benessere dei cittadini, residenti e non e della diffusione artistica e culturale, quali obiettivi comuni dell’amministrazione pubblica e del Politecnico di Milano”.

⁴ In particular we refer to the research ‘Smart Plan. Open innovation in urban discovery and planning for the Città Studi Sustainable Campus project: from master plan as alignment environment to urban digital footprint’ (<https://smartplanpolimi.wordpress.com/>), and the european project ‘Periphéria’ (www.periphéria.eu).

Campus working group. The variability of the actors involved in each phase and the modification of their roles along them can be better understood and explained when exploring the boundary objects that worked out in the process. In the following they are described.

3.3.1 Experimenting the Urban

At the moment this boundary object started to work the academic group contribution to the development of the process has been pivotal. The activity stayed on two levels: dialogue and interaction by one side, design of general strategies and main actions by the other. In both the dimensions the activities aimed at maintaining a general coherence of the project and facilitating the decisions making process. The group drove the context to create and adapt choices and new proposals towards more collaborative, synergic and experimental approaches which definitely helped (us and) the main stakeholders, such as the Municipality and University, to redefine the problem, and imagine new solutions.

3.3.2 RiconquistaMi

With a strong reduction of the budget planned by the Municipality, the contribution of the working group was shifted towards the organization and networking of already planned events by the Municipality and the Neighbourhood Council, both strongly supporting this phase. The experiments of the previous phase acquired a new value, and allowed the re-conquest of the public space.

3.3.3 Subtracting and Filling the Emptiness

As institutional programs were going to be organized, in the meanwhile, some self-organized activities by local communities, artists and associations took place interfering positively with the more structured activity of institutions. In this phase the RiconquistaMi idea and finally the availability of space (the square become empty, as without cars) commit each actor to assume a pivotal role and to be personally and operationally involved. Moreover the university multiplied its way to take part in the process by setting design laboratories and instant design activities for and on the square, inviting the Municipality and the Neighbourhood Council to take part at the final presentations. The institutions—in particular for the Città Studi Campus Sustainable leaders—played variable roles: they constantly pass from one to the other the role of leader of the process and the role of pushing on the requalification. They share somehow in a tacit way the responsibility of a political, economical and technical choice.

3.3.4 University-City Cooperation and the Formal Agreement

These two boundary objects worked in the last phases when the involved actors have been technical experts and political delegates. Their involvement was strictly related to their formal roles within their institutions. It is interesting to notice how it looks somehow unusual and bizarre how each player of the game, after years of fear interplay, has been getting back to the more static and conventional attitude in order to guarantee their organizational objectives when more traditional decision making is taking place.

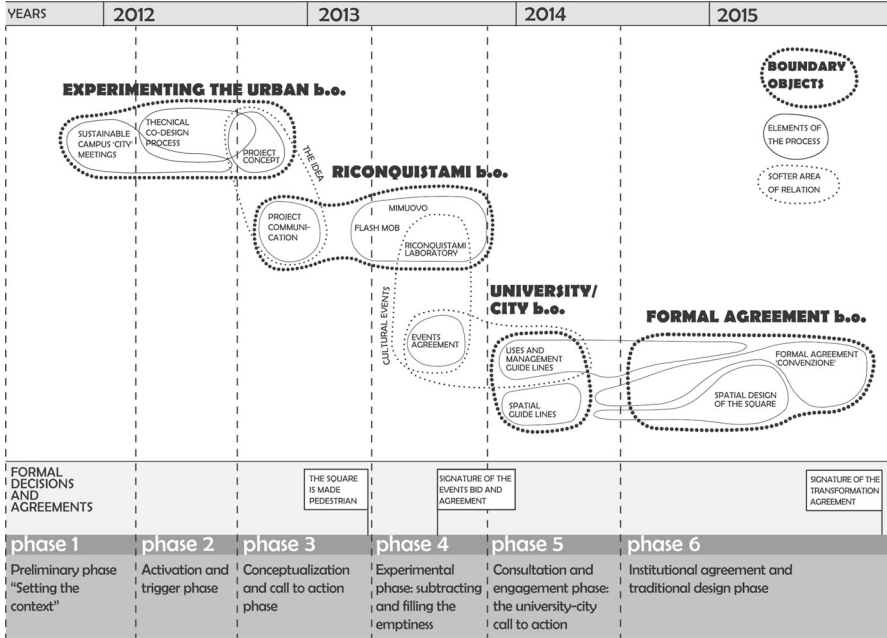


Fig. 1 Phases and boundary objects

Figure 1 maps the different boundary objects along the 6 phases. It is clear that they have evolved along the process and in some cases two of them have overlapped and have worked in synergy enabling the coordination of the whole process.

In the process both formalized procedures and informal paths have been used, as described so far, to pursue the *coordination* discussed in the early paragraphs, in respect of the type of action carried out.

The role of coordinator has been switching from one of the three main institutional actors to the other, in a variable-rhythm composition. This fact echoed a metaphorical association with the “composition” concept in music and dance as developed by John Zorn’s experimental works in music improvisation of the ’80.⁵ His technique developed a semi-improvised framework of the composition, where starting from a *light set of shared and simple rules*, the composition is produced in time. Its development is softly “monitored” by a light orchestration which is directed by one person at time who plays the role of orchestrator for a segment of the composition and then pass his role to someone else. This variable coordination guides the other performers that are quite free to make improvisation within a set of choices.

⁵ Zorn produce his work on improvisation in 1984. The name of the project is *Cobra*, it has never been published according to the author’s will, since Zorn believes in oral transmission. Nevertheless, several music composition has been recorded (see for instance *Cobra* live performance in Tel Aviv, in 2008, <https://www.youtube.com/watch?v=3axwvjwUpNE>) and a music CD booklet, containing printing of all the cue categories and rules, was published.

Table 1 Decisions along the process

Phases	Formal decisions	Main micro (informal) decisions
1. Setting the context		Activation of a process to re-think the square by Politecnico Initiate an interaction with the municipality No one formally in charge of the square
2. Activation and trigger		Activation of an experimentation process: the square as the output of an experiment Cooperation among different institutions
3. Conceptualization	The square is made pedestrian	RiconquistaMI initiative is shared between Politecnico and the municipality Engagement of new actors to activate the experiments Activate the process to make the square pedestrian
4. Experiment	Agreement on events' agenda	Preparing the agenda in a shared way mixing art, theatre, and sport initiatives
5. Consultation and engagement		Guide lines for the re-making of the square by Politecnico following the events' observations Shared responsibility of public spaces
6. Traditional design	Budget agreement on transformation	Re-framing the design task Politecnico makes the design for free

The metaphor is quite suitable to the process discussed and analysed here, since the composition is the result of a learning process of semi-structured improvisation, where each player learns and adds to other players' work, that is to say growing and toning in time, while braking with some sudden events, highlights of the composition, for us accumulation or innovation point.

3.4 Decisions' Dynamics Throughout Boundary Objects

As indicated in Fig. 1, three formal decisions have been made along the 6 phases, namely: (1) the square has been made pedestrian (by the Municipality at the end of phase 3); (2) An events' agenda is agreed (signature by the Municipality and the Politecnico di Milano during phase 4); a collaborative budget is agreed for the transformation works (signature by the Municipality and the Politecnico di Milano end of phase 6).

To shape the three formal decisions other "micro" decisions have been made along the process not having the same formal nature still being relevant for those and feeding their contents and framework. Table 1 illustrates the most important micro-decisions along the 6 phases.

Table 2 Actors involved in the process

Nature of the organization	Organization name	People/unit involved
Governative institutions	Neighbourhood Council	President
		Vice president
	Milan municipality	Urban planning and design unit
		Sport activity and infrastructure unit
Universities	Cultural heritage regional agency	Cultural activity unit
		Sport and wellness department
	Politecnico di Milano	Mobility department
		Urbanism department
		Technical staff
		Responsible for the neighbourhood of Milan
		Responsible of the sustainable campus initiative
University courses	People responsible for the meetings with citizens, associations and public agencies	
Associations and others	Thematic workshops	Simulation laboratory "Fausto Curti"
	Urban designers and technical experts	Students
	Technical-administrative unit	Urban design and smart cities
	Schools	Urban design
Associations and others	Students associations	Piazza Leonardo laboratory
		Architecture built environment and construction engineering department
	Sports	Unit for strategic partnership
		Unit for the interaction with firms
	Artistic and cultural associations	Building infrastructure unit
		Primary school Leonardo da Vinci
		La Terna Sinistrorsa
		Ass. ALSER, ass. ASTL, soc. Ginnastica Propatria1883, ass. Judo Milano Club, ass. Kokoro, Polisquash, Podisti da Marte, ass. Rucellai, ass. Rugby Union '96, ass. Slackpassion, ass. Yin Yang Tai chi, Tumminelli&Basket femminile Milano, ass. Volo Obliquo, ass. Zerogravity, ass. MB Crew, Podisti da Marte, ass. Kokoro, ass. Slackpassio (all are part of <i>MiMuovo</i> project)
		AV Tourneè
		Effetto Larsen
Il filo di paglia		
Karakorum		
Tilde		
Ci vuole un fiore per Margherita		

Table 2 continued

Nature of the organization	Organization name	People/unit involved
	Individual artists	Matteo Lanfranchi, Julia Binfield, Maria Carpaneto, Nicola Ratti, Enrico Malatesta, Attila Faravelli

3.5 Roles' Dynamics Throughout Boundary Objects

In the process various types of interaction have been enacted: from a direct one-to-one relationship, to an increasingly wide form of interaction. At the same time the material result of the *coordination* and the *coordination* itself varies in our process from the production of communicative representations of the project, evaluations, suggestions, data collection, to the realization of specific laboratories and workshops and to the construction of micro planning actions that are characterized by a multiplicity of often miscellaneous subjects. This operation is ranging from real uses to visions of the urban space, building a system that employs small new energy sources while prioritizing those already available.

The coordination described above is achieved aligning, driving, synergising with several actors each having different roles and owning different levels of power. Table 2 shows the diversity of actors and organizations involved along the process, some of them identified by their roles inside their own organizations.

Analysing the different actors, and in partial coherence with the roles each of these actors plays in his/her organizations, we can identify five main roles they played within the process:

- Taking part
- Implementation of contents
- Implementation of actions
- Coordination/conduction
- Decision formalization

These five roles have been evolving, though coordinated, along the process. According to the analysis carried out in this article, fundamental to the achievement of such a coordination dynamics, boundary objects have been drivers for different players to align and coordinate intentionalities and actions into a larger and shared whole that can be described as a trading zone which is itself evolving all along the process. The following Fig. 2 presents the roles played by the different actors in coherence with each boundary object.

Although Fig. 2 presents only the analysis carried out for one of the boundary objects, some recurrences already appear relevant to describe the kind of actors dynamics along the decision process: each boundary objects creates a cluster of actors each involved with different roles even contemporary; the roles and the actors change from boundary objects to boundary objects along the phases.

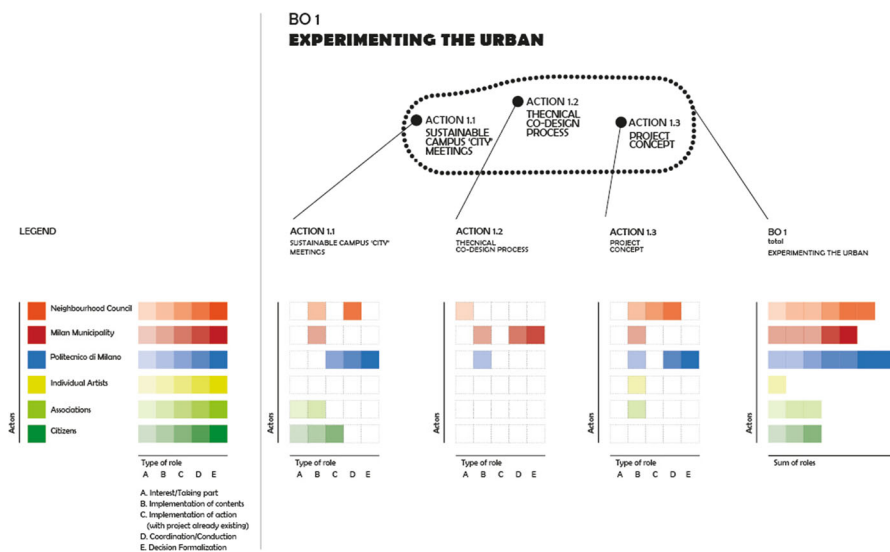


Fig. 2 Analysis of the roles of actors involved following boundary objects

4 Conclusions

The article discusses and operationalizes two main concepts and their relevance within the framework of public space design and transformation: the one of “trading zones” as multi-organizational environments where coordinated actions are made possible at the boundaries of different organizations by the use or creation of boundary objects; and the one of coordination dynamics, intended as an emerging property of decision systems when they operate within trading zones. The discussion has been supported with the analysis of a real public space design process carried out as an experiment to reduce the gap between space design and transformation so improving the public space ownership.

The described experience shows the creation of a, trading zone, a “hybrid arena of practice” enabling coordination among far different organizations (Galison 2010) and out of full agreement on, values, significance, goals and perspectives of the action. In the Piazza Leonardo da Vinci experience, the hybrid arena created showed that conditions are possible where the “doing” does not require a full verification and sharing of the “why”. Doing here is intended differently by different actors; still some, incomplete, dynamic coordination is there also enabled by a thinness, although powerful, exchange. Staying in the Galison (2010) analysis exchange takes place in this arena around different resources: availability to coordinate, ability to make decision, resources (material) ownership, and even trust. In the Piazza Leonardo da Vinci trading zone, material and immaterial resources have been exchanged shaping the action of the square transformation and no precise, clear cut, sharp agreement has been necessary for it.

The developed trading zone was enabled by:

1. keeping the level of formalization at the minimum possible; this allowed a significant openness of both the process and the related emerging organization where actors were very dynamical and often exchanging their roles and their presence in the process;
2. developing a sequence of boundary objects along through the process all being low structured scenarios, so supplying wide and fuzzy visions to enable many, diverse views and value systems to find their ways in the process and sharing specific and temporary commitments.

As already said, the “square” can be seen as a boundary object itself: in the described process it can be considered a framework boundary object. In our view this role can be played in general by public spaces due to their nature. Public spaces are complex spatial objects to be interpreted in their uses and values.

The organization emerging within the trading zone showed to be highly complex, variable along time, and can be described as non hierarchical and having an open nature: it worked in temporary teams; roles were stable and specialized in some time-frames and dynamic and blurred in some others; boundaries were changing along the process from clearly defined to fuzzy and permeable.

Along through the process, decisions have not been made by the same entity; they rather evolved from centralized to decentralized modes depending on the level of formality required at the different stages (often related to the need of financial resources). The lower is the degree of formalization the more decisions have an experimental nature that enlarge the power of the boundary objects and make the trading zones still active and able to attract new actors and organizations.

In the created arena of superficial and incomplete understanding between the different involved organizations decisions have been made which are differentiated depending on their decision core: when they are collective, shared, made on the boundaries of the different involved organizations, they are deeply informal, low structured and basically focused on doing, doing together in the space of the square, for that space; when they have a more standard, formal nature they are very often located inside a single organization and are mainly related to create, enable, allow a new organizational commitment to continue the “trading” and the action on the boundaries. These decision dynamics have produced both the slow transformation of the square, the creation of several square scenarios alternative to the car parking one; as well as, the production of a set of interconnected boundary objects as described and mapped in this article.

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