Service design methods and tools as support to the participatory definition of the meta-design brief of a contemporary integrated campus

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Abstract

Service Design can contribute to Spatial Design not only through data collection from the involved stakeholders and their demands analysis but also through the improvement of methods and tools to engage final users, to trigger interactions among them, to stimulate ways of conceiving and creating new living and working lifestyles and social environments. An especially challenging task emerges from the enhancement of programs and facilities particularly affected by transformations and new configurations of learning and research environments. This paper focuses on the definition of tailor-made methods and tools merging the contribution of Service and Spatial Design for the meta-design development of the new scientific campus of the Università degli Studi di Milano to be built on the former Milano Expo 2015 site.

KEYWORDS: participatory design, community engagement, co-design, capability development, human experience sense-making, multidisciplinary research, learning & teaching environments, higher education facilities, meta-design

Introduction

Background

Service designers are usually in charge of gathering information during co-design workshops with users and various stakeholders so to tailor the design of viable and sustainable services to the emerged needs and desires. Service Design methods take the side of the real users with their hopes and worries: working closely with all stakeholders is a fundamental axiom of the practice. Specific tools can help visualizing and illustrating flows of people, resources, goods, and knowledge within a given system, so to ensure it's functioning as smoothly as possible. Of course, the visual language must be clear and understandable, to be reviewed

and discussed by non-designers in participatory settings (Van Berkel & Bos, 1999). Interactions, relations, and activities are valued more than established typologies of objects and places. Therefore, built-in habits and chronic practices are often deconstructed and questioned, leading to the generation of new solutions that can potentially reshape behaviors, products, places and their arrangements, and eventually transform society. On the other hand, in a participatory framework, designers, donning the hat of the facilitator who helps others to be creative, encourage the involvement of end-users and other stakeholders as co-designers. A side gain of this approach is that co-designers will be proud and take ownership of the process, facilitating an implementation sustainable in the long-term (Sanders, 2013). What follows is an account of how Service Design methods and tools have been used to define the set of principles, guidelines, and reference rules capable of generating, at a later stage, the layout for an integrated campus of the Università degli Studi di Milano on the former Expo 2015 site. The starting assumption is that a campus is first and foremost a web of connections, relationships and interactions between individuals and groups (Amelar, 2016) that should be eased by the spatial context in which they take place.

The plan of transferring the science faculties of the Università degli Studi di Milano to the new site raised the challenge to envision spaces suitable for current and future forms of interdisciplinary collaboration in research, teaching & learning practices. The Politecnico di Milano has been involved from the outset as the chief consultant to investigate high-level project requirements, desires, and needs for a coherent and efficient organization of the different activities. The outcome was not meant to be translated directly into a preliminary architectural concept of the Campus. Instead, the assignment was about setting both quantitative and qualitative parameters related to spaces and activities as well as to their relationships (Collina, 2005). At a later stage, an organized set of information should be passed onto architectural firms and developers participating to the international competition for the master plan and architectural proposal, in such a fashion to leave room for a flexible interpretation and innovative typological and technological solutions.

The general plan for the Expo 2015 site conversion, managed by Arexpo SpA, aspired to achieve an integrated redesign of the strategic area through the establishment of a "Science, Knowledge and Innovation Park" in line with the vocation of 2015 Universal Exposition to research, education, and sustainable development. For this reason, scientific and technological research institutions, both private and public, were invited to join the design of a vibrant and mutually stimulating environment for collaborative studies and crossbreeding interactions. The scientific faculties and departments of the Università degli Studi di Milano, often scattered in existing buildings no longer up to standard, were in need of renovation to update research infrastructures and laboratories. Therefore, it seemed a valuable opportunity for a radical renewal not only of the spaces and their relationships but also of innovative research and education practices.

The primary goal of the new campus project is to provide the physical infrastructure for cutting-edge scientific innovation and discovery as well as for interactions within and beyond the campus boundaries. Hence, the name of the project "Science for Citizens" underlines the pivotal role of the university to enhance the welfare and health of the whole the society (Chatterton, 2000) thanks to the continuous dissemination of research results, and suggests the idea of a campus with no borders, open and integrated to the city.

A scientific collaboration agreement between the Università degli Studi di Milano and the Politecnico di Milano has been signed to follow up with the following actions:

- to foster base and advanced research;
- to establish strategic partnerships with worldwide academic and industrial partners;
- to develop new interdisciplinary research pathways in response to emerging societal challenges;
- to provide a research-led tertiary education.

In the "Results" section of this paper, we present the outcome of the first phase of the research: a preliminary version of a guidelines booklet (Università degli Studi di Milano, 2017), an urban scale diagram, and concept explorations of the campus layout in the former Expo 2015 site.

The second phase, which is currently ongoing, will result in a revised version of the booklet based on the activities carried out during the co-creative workshops with the campus' users and a relationship diagram.

Finally, we conclude the paper describing in greater detail the envisaged future steps and possible developments of the research.

Research aims

The objective of the research is to investigate how Service Design methods and tools can contribute to the participatory definition of the meta-design brief of a contemporary integrated campus.

Research objectives

The research aim has been articulated in the following goals:
- Reviewing existing design methods and tools with a specific focus on three areas:
    - Strategic Design: specific methods and tools capable of tracing a middle pathway between spaces and services, a sort of third culture suitable to capture the most relevant interactions, whether already in place or desired, to inform the set of spatial guidelines.
    - Participatory Design: co-design frameworks to gain experiential insights and highlight critical issues about daily practices and behavioral patterns in university campuses;
    - Spatial Analysis: methods and tools to achieve an in-depth understanding of the settlement's physical requirements so to achieve rationalization and efficiency;
- Designing and developing tailored design tools to be used during the co-design workshops with the primary users and stakeholders.
- Conducting the co-design workshops.
- Understanding and evaluating the participant experience of co-design as non-professional designers.

The desired outcome of this hybrid service/spatial design approach is to overcome the present physical separation between faculties and researchers, which has generated over the years rigid disciplinary silos, frequently leading to self-referential, narrow-minded attitudes, possibly detrimental for innovation and research advancements.

Methodology, Methods and data collecting

The objective of the research is to investigate how Service Design methods and tools can contribute to the participatory definition of the meta-design brief of a contemporary integrated campus.

Constructivist approach

In this project, we used a constructivist approach according to which reality is socially co-constructed, and it's meaning is the product of the constant interaction between participants' understanding and sense. Previous experiences and knowledge are always at play in filtering the information selected for the development of new concepts and shifts in personal ideas, and points of view are possible and desirable thanks to these interactions. Making judgments explicit is crucial when shaping a complex artifact like "an integrated campus," which is by no means an objective category of the natural world. Designers and participants are engaged

in a continuous process of exploration and bilateral negotiation to determine how the meaning's hierarchy is constructed. Without an explicit agreement about the conceptual architecture, in fact, a productive communication is impossible, and all sorts of arguments can generate at any stage. If in a constructivist approach knowledge is produced through actions and interactions, then the encounter between the facilitators and the participants can be seen as an opportunity for knowledge construction that is meaningful and valid. The use of innovative Service Design tools, as a method of gathering and discussing qualitative information related in this case to highly complex and specialized spaces and equipment, allowed for interactive conversations oriented toward concepts' exploration from different angles and backgrounds (Baule et al. 2007). It also created a safe environment for participants to express themselves in their unique propositions. Through intentionally designed tools, even unexpected ideas were welcomed and discussed, providing valuable in-depth uncensored insights. Unprecedented scenarios of potential participation in joint research, learning or teaching activities emerged during the workshops from personal experiences and individual ideas of the participants.

Recruitments and Participants

Since the beginning, the design team adopted a user-centered method, which led to the definition of different categories of research participants: one Rector and one General Manager, 13 Chairs of the Departments and their 13 delegates, 3 Property Managers, two members of the technical staff, and 14 students were involved.
According to institutional procedures, they were initially summoned by the Property Managers on behalf of the Rector and General Manager and for the following meetings by the design team directly by email.

Quantitative and Qualitative data collection

One of the initial tasks was to review the surface indexes and ratios of the existing fragmented and obsolete campus to achieve the servant spaces rationalization in the current facilities, often proliferated over the years without integrated planning. A benchmark analysis was carried out on the standards of gross floor area per student in the most recent and innovative scientific campuses worldwide. That initial information drove the team to the conclusion that the foreseen criteria for the new complex should be more compact and rationalized to ensure sustainable maintenance costs over the next decades.
The research team engaged participants from a broad spectrum of categories in an iterative process of data gathering, analysis and comparison at the end of which the participants should have been able to distance themselves from the current constraints and start imagining future scenarios with a new mindset.
Distinctive data gathering techniques have been used to obtain information from the different demographics. Quantitative data collection was carried out through surveys and questionnaires while the collection of qualitative data was handled through interviews, focus groups, ethnographic observations and various other tools designed on purpose like, for instance, a set of cards.
The ultimate goal of this activity was to look at the design context through the eyes of the primary stakeholders, to verify the initial project hypotheses and to collate all the information into the meta-design brief of a contemporary integrated campus.
In the preliminary stage of the research, the Executive Team of the Università degli Studi di Milano commissioned a benchmarking to collect the first set of quantitative data related to the science faculties of the future campus. Starting from these figures, the team of architects and designers from the Politecnico di Milano launched an exploratory activity of the existing campus faculties to verify the data and integrate them with qualitative ones.
In the following stage, activities of interpretation, interaction, and comparison were implemented in collaboration with the Property Management team to fully understand the relationship between the different functions of the current campus and the future space requirements, including the issues generated by the buildings decay.

The Department Chairs and their delegates appeared as the main interlocutors for their ability to provide the figures - even though fragmented and in progress - in the most relevant thematic areas of the project: departmental laboratories, didactic laboratories, and didactic classrooms. Forms, developed on purpose, were presented and explained during a joint meeting and then distributed to the Chairs to be completed autonomously with the aid of the department staff.

The research team moved then to a zoomed-in analysis of the different core functions of the campus for which a stronger engagement of the final users of the spaces was highly desirable. The complexity of the system, which comprised people and logistics fluxes from departments as diverse as biology, food science, pharmacology, chemistry, geology, physics, mathematics and information technology, was even enhanced by the dramatic changes caused by the advancements in learning and research methodologies to the spatial design of higher education facilities.

Two kinds of workshop activities were conducted: the first aimed at including students in the design process, the second, more complex, at involving the academic staff in the process of collaborative design.

Students' representatives were gathered in two meetings: during the first, the research team explained the planned activity and their role of spokespeople and intermediaries between the Politecnico research group and the enrolled students. They also asked the participants to fill in diaries to gather more detailed information (Fig. 1). Also, a password-protected Pinterest board was set up to collect pictures of the best case studies of worldwide learning spaces suggested by Erasmus colleagues, along with a visual narrative, to be told through images and shots, of unsolved issues in their experience as students.

The second meeting was called to collect and discuss the information. While the students' representatives had responsibly accomplished the assignment of filling in the notebooks with suggestions also gathered during informal talks with colleagues of different courses, the social media channel revealed unsuccessful probably due to the complicated process of authentication.
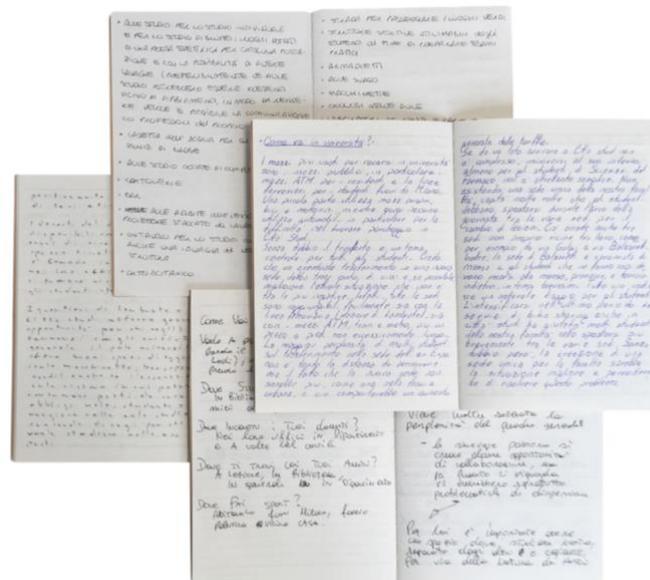

Figure 1 – Sample of the diary notes filled out by the students' representative.

The diaries' notes were then discussed, classified and interpreted during a plenary session with the Politecnico team (Fig. 2).

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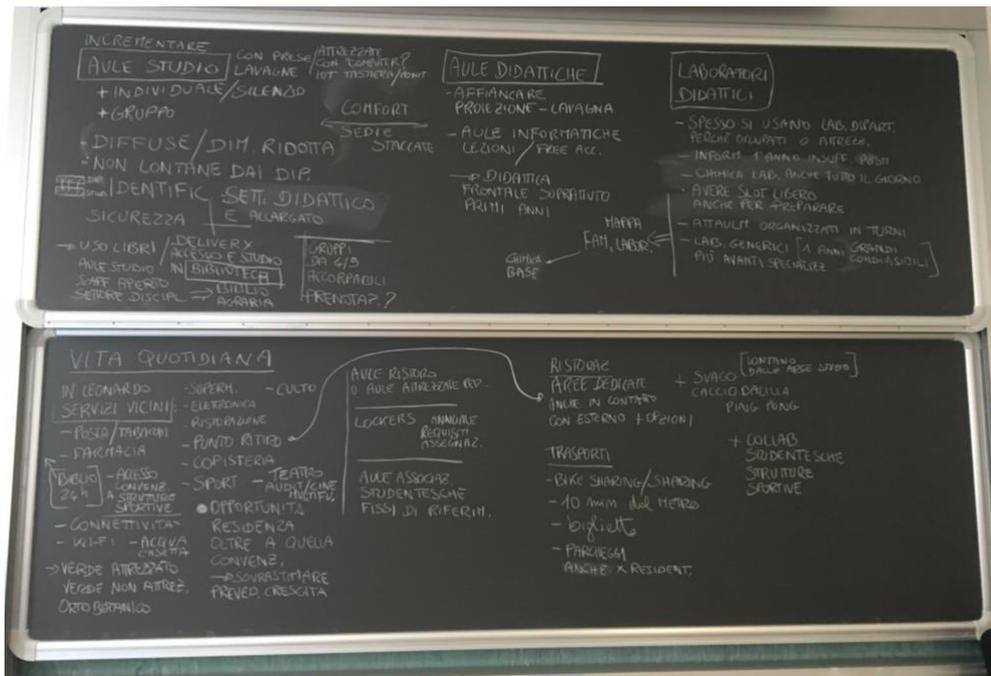Linköping University Electronic Press

Figure 2 – The plenary session to discuss, classify, and interpret the diaries' contents.

Further qualitative data collection was accomplished through a process of Ethnographic observation of participants in their work context.

Finally, a more detailed account of the cards' method used by the academic staff is given in the following section, due to their relevance in the context of the Service Design discipline.

Cards

The workshop activities planned to involve the academic staff in the design process were organized in four consecutive weeks before the summer holidays. Chairs and appointed representatives from more than one department were invited to focus groups according to the existing or possible multidisciplinary collaborations (Kelsey & Labov, 2013). The general purpose, in fact, was to have them working and reasoning not only on the characteristics of the different laboratories and ancillary related spaces but also on the facilities and services potentially shared among various departments.

The card deck tool has been a support to facilitate interactions and trigger unprecedented conversations between different departments' members (Sanders at al. 2010). Participants were invited to look beyond their current state, creating future scenarios able to shift deep-seated habits and behaviors toward multidisciplinary interactions (Sennett, 2012). The workshops aimed to get an overview not limited to the characteristics of the different spaces but also of the level of adjacency or separation between them. Also, the tool provided the chance to switch roles: non-designers became "professionals of the everyday experience" (Meroni, 2007) with the aid of the Politecnico team members as facilitators; vice versa, designers could step in the shoes of science researchers and professors (Sleeswijk Visser et al. 2005). The card deck tool is not an innovative tool per se: IDEO launched a very successful deck of method cards (IDEO, 2003) to be used during co-creation workshops to trigger suggestions trough signs, images, and questions or to generate new ideas from general insights.

The pack designed for this project though introduces an unprecedented integration of synthetic quantitative and qualitative information in the same format (Fig. 3).

Figure 3 – Sample of the color-coded cards

Three types of spaces are represented through distinctive kinds of cards: research laboratories are color-coded as dark green, ancillary working spaces are light green when nearby the lab, orange if shared by the laboratories of the same level or building.
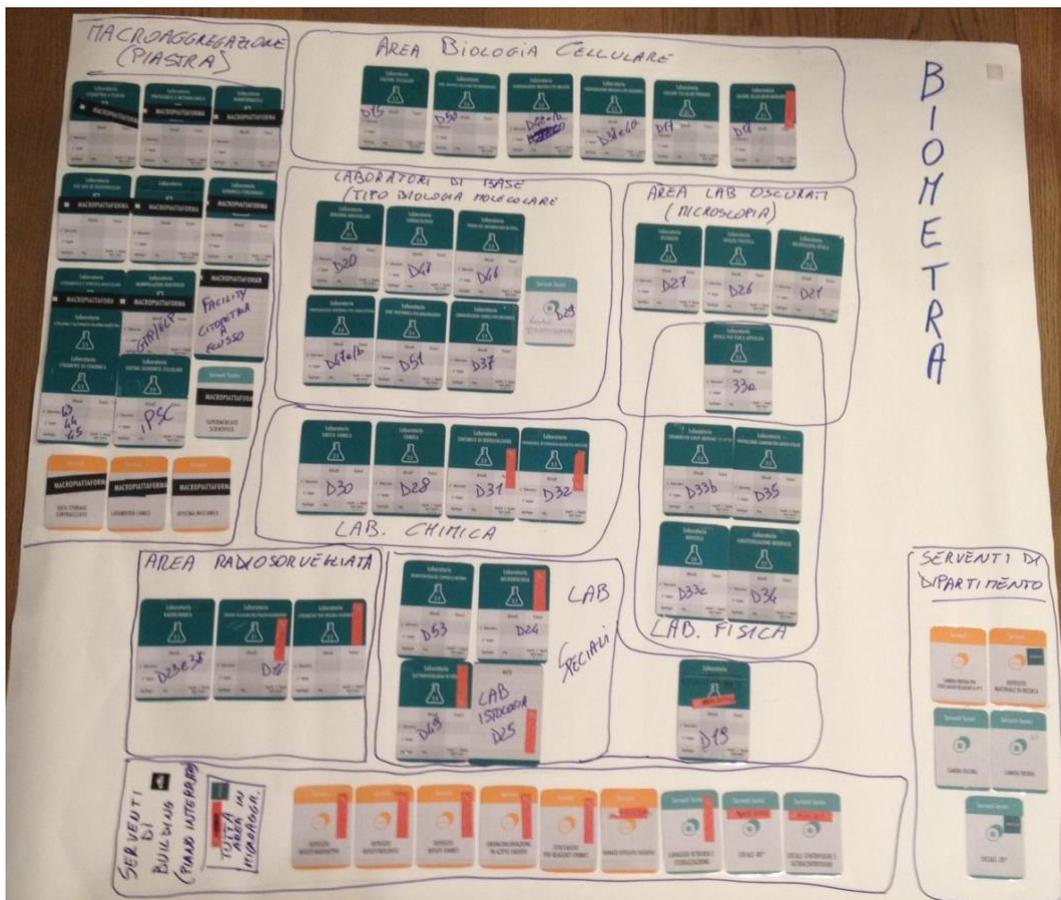

Figure 4 – The color-coded cards clustered by the workshop participants

Each participatory workshop started with a quick preliminary introduction, to give simple instructions and samples of the expected activities. The clustering of the cards into families was then completed during workshops organized autonomously by each department in the following 3-4 weeks. Eventually, a strategic conversation between departments considered similar (and therefore convened at the same time) was started to check some of these could be shared.

Before the beginning of the workshops, a check of the completeness of the card deck led to the decision of providing blank cards for editing or adding new desired spaces in real time. Also, appropriate stickers (Fig. 3) have been distributed to add further indications about the possible location of the area at the underground level, requirements for specific logistics accessibility (e.g., parking facilities), and the degree of potential sharing at the departmental, faculty or campus level.

Results

We provide here a chronological account of the research development that is represented in the timeline below (Fig. 5) with the relative outputs.

The first phase, from February to April 2017, resulted in the completion of the first version of the meta-design tool describing the general concept of the campus, and its physical and social relations with the city. The guidelines were, in fact, to be included in the competition documents for the Arexpo SpA public tender concerning the master planning and development of the broader Expo 2015 Area. This very first edition involved only to a limited extent the actual stakeholders from the Università degli Studi di Milano. It was developed mainly through interviews with specialized international designers and deans, a bibliographical research on the current global debate about higher education facilities, and contemporary innovative case studies.

Furthermore, a first set of forms created on purpose was distributed to the Chairs to gather the preliminary quantitative data related to the academic staff, their mobility habits and the surfaces of research and educational spaces. The fill-in process carried out autonomously in the following weeks was completed by the Departments' Chairs, and the documents were delivered by the end of March.

At the same time, an architectural firm that was assigned with the task of testing the feasibility of the new campus program developed three different areas of the former Expo 2015 site exploring different possible layouts.

A first meeting with the Chairs and the Academic Senate was organized to present and approve the first document.
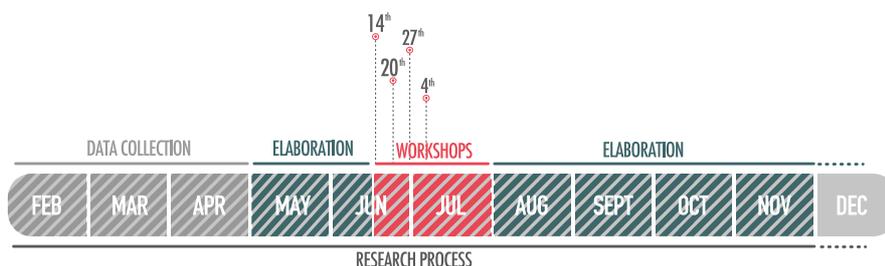

Figure 5 – The Project Timeline

The second phase, which started in May 2017 and is still in progress, will produce the second version of the meta-design tool with the definitive set of requirements for the development of the preliminary design of the campus. During this period the workshops were organized for the application of the cards tool as well as for the presentation of new sets of forms

developed on purpose were distributed to the Chairs to collect new quantitative data concerning the research spaces. The booklet will also include a diagram representing the spatial organization, the shared activities, and services, and the spatial relationships among the buildings (e.g., the degree of adjacency, location above or below the ground, required infrastructure, etc.) that emerged from the workshops and the bibliographic research conducted.

Outcome analysis

The results achieved through the second phase of the research development, albeit still on-going, look promising for the participative approach adopted. The initial goals of rationalising the servant spaces of the existing fragmented research facilities, pursuing and enhancing multidisciplinary approaches and a cross-fertilization in research programmes were reached through the card game tool that triggered a new mindset and innovative projects in the university research staff, even activating "adversarial collaborations" (Kahneman, 2011). The department representatives, though initially baffled but also amused by the apparently childish game, soon acknowledged the potential benefit of using the tool to make tacit knowledge explicit, shared, and negotiated. The open discussion and rethinking of the research methods and practices led to the establishment of new partnerships and activities that can take advantage of the equipment's concentration in a macro-platform characterized by highly specialized areas.

Discussion and next steps

From the benchmark activity conducted on the worldwide standards of gross floor area per student emerged the necessity to develop a coherent system of interconnected services mutually reinforcing through collaborative practices. In the next steps, we are going to collect best practices of university campuses' services combined in networks with the aim of generating a scenario framework for the project.
Through on-field research, the cases collected should be a mix of various characteristics, e.g., service models capable of breaking the discipline silos and fostering multidisciplinary interactions; substituting the ownership of goods with the access to the relative function; being accessible to citizens on evenings, weekends and holidays to avoid the "gated campus" effect.
The data collected will be analyzed and used to build an integrated scenario for the new campus where services can overlap, amalgamate and share resources to create a robust symbiotic network.

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