Chapter 5
Design At the Intersection Among City Challenges, New Public Services, and Policy-Making

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Abstract Societies and cities are living in times of deep cultural changes. Design of course has sought to tackle city societal problems in the past, but this has largely been confined to design activism (and to the political sphere of the design action). Its main aim has been to raise awareness of specific problems and/or demonstrate dissent with mainstream cultures. In the last 10 years, however, there have been various design initiatives that have worked at city scale to solve societal challenges, producing reliable and useful solutions and valuable impacts on the life of real people.

When applied to city challenges, design assumes the practice of complex participatory processes involving a large number of actors and stakeholders in tense settings or open conflicts.

Complex participatory processes go beyond the established principle of designing for context-dependent problems, extending the idea of participation to include (1) the relation between the context of the problem to be addressed and the design of the network that will coproduce the solution and (2) testing different configurations of that network until a robust partnership is individualized and established in some institutional form.

The contribution relies on the intuition that design can act as an agent of change for public institutions, which are currently facing new and unmet societal challenges that appear to affect cities at different levels. These include the quality of the services offered by municipalities and the way in which public institutions deal with service innovation in conditions of scarce resources, with new phenomena such as social innovation. The chapter also introduces a design-led project implemented in the framework of the My Neighborhood European Project, with a double aim, i.e., to experiment service design as a tool for designing innovation in the public sector and to experiment service design as a tool to boost innovation in the culture of a public institution (the Municipality of Milan).

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5.1   Design for City Challenges

This is not just an age of recession and austerity, but of truly profound disruption and dislocation, so the kinds of challenges that cities face at this time are only seen properly in that context (Hermant-de-Callataÿ and Svanfeldt 2011). It is an economic disruption, because cities in Europe, for instance, are desperately searching for sustainable economic models, and, even when growth returns, the question of which economic model best sustains society will still not be settled.

It is a time of profound technological disruption, with a continuous wave of new technologies and applications, which are destroying old industries and providing new opportunities to create value and new ways of collaborating at the same time.

Governments everywhere, at every level, from cities to regions, from nations to the whole European continent, are facing serious challenges because of their distance from society and their ineffectiveness and inefficiency at addressing important issues such as the need for growth (these problems threaten to overrun existing infrastructure and create profound inequalities). In industrialized contexts, governments are not dealing with the problem of decline and decay, which are associated with economic disinvestment that leads to social and political disinvestment. To crown it all, societies and cities are living in times of deep cultural changes, brought on partly by technology, which is a growing culture of massive participation in which people, citizens, and creative communities increasingly expect to be part of, to voice their opinions, to connect, to organize, to choose, and to have feedback on absolutely everything they are involved with.

Considering all the above, it is possible to see why the challenge for the next 20 years (at least) is not to develop new products or new services – it is to develop new urban ecosystems with new cultures and new forms of behavior. These urban ecosystems have to be both more efficient and more human oriented, to guide planners, policy-makers, service designers, and intermediaries through the challenge of making cities capable of rising to their internal societal challenges, using, among other things, the advantages provided by technology and the way they can change our lives (Mulgan and Leadbeater 2013).

This is the example of the city of Curitiba in Brazil, one of the most impressive smart cities in the world. Curitiba is a city which is designed in a systemic way; it has plans for transport, for building, and for regulations, but it also understands that its future depends on mobilizing its citizens to create solutions. In a city like Curitiba, the smart transport system has been combined with civic spaces that are open, easy to access, and convivial. Here the solution to some problems like recycling depends not on large systems but on creating a lot of micro recycling entrepreneurs, who create a business out of collecting rubbish and then recycling it. Models of cities like Curitiba are questioning the existing planning methods used by governments

to provide for citizens when dealing with city challenges. How do we deal with a growing environmental crisis that fundamentally questions the sustainability of our way of life (making us more aware of its effects on social well-being) and raises the question of pollution and of energy resources? How do we seriously address the demographic situation and the challenge that it presents, i.e., dealing with a much higher number of elderly people and limited resources to take care of them? All these questions are co-defining the current state of crisis, and they seem to imply that, through a "failure of agencies," public institutions and organizations have failed to answer them.

Design of course has sought to tackle city societal problems in the past, but this has largely been confined to design activism (and to the political sphere of the design action). Its main aim has been to raise awareness of specific problems and/or demonstrate dissent with mainstream cultures. In the last 10 years, however, there have been various design initiatives that have worked at city scale to solve societal challenges, producing reliable and useful solutions and valuable impacts on the life of real people. Examples include John Thackara's Doors of Perception conferences and blog (http://www.doorsofperception.com), Bruce Mau's book *Massive Change* (2004) and his Institute Without Boundaries, Cameron Sinclair's nonprofit organization Architecture for Humanity (http://architectureforhumanity.org), and Emily Pilloton's Project H Design: Supporting Community (http://ced.berkeley.edu/frameworks/2012/project-h-design/). What is emerging today is a new wave of design projects, a new vision – partially elaborated in the context of design culture – that focuses on the application of design to tackle city challenges as complex problems and to find solutions at the level of the cities and territories (Latour 2010; Binder et al. 2011; Hamdi 2004).

Design culture has received many definitions in literature (Julier 2006). The notion here embraced is the one that pushes on the front of the capability of design to work from a context-dependent point of view, together with the design attitude to scale solutions through experimentation (Deserti and Rizzo 2014).

When applied to city challenges, this notion assumes the practice of complex participatory processes involving a large number of actors and stakeholders in tense settings or open conflicts. Complex participatory processes go beyond the established principle of designing for context-dependent problems, extending the idea of participation to include (1) the relation between the context of the problem to be addressed and the design of the network that will coproduce the solution and (2) testing different configurations of that network until a robust partnership is individualized and established in some institutional form.

Many projects in particular are evidence of this new kind of design practices (Manzini and Rizzo 2012; Julier 2013). They exemplify a new trend in the relation between design and cities – design is definitely moving toward the design of complex systems, gaining a position as a discipline that can have an impact on society and on the real life quality of people, as a culture of innovation that transforms cities and territories.

Malmo Living Lab is an example of this kind of design-led project, which works to boost micro and bottom-up solutions as services to address local city

challenges (Björgvinsson et al. 2012). In 2009 the media institute Medea at Malmö University (with the financial support from the KK Foundation and EU structural funds) launched three living labs for coproduction and social innovation in the city of Malmö. The city is characterized by multiethnicity, cultural production, youth culture, and new media industry. This is also the rationale behind the content orientation and the cultural and geographic position of the three suggested living labs. "The Neighborhood" is set up in the contentious multiethnic Rosengård suburb and focuses on changes in urban space, collaborative services, and social media. "The Stage," set in the vibrant club, music, theater, and subculture environment around Möllevångstorget, focuses on cultural production and cross media. "The Factory" is located by the Stapelbäddsparken skateboard arena in Västra Hamnen, in the heart of the city's new media cluster, focusing on innovation strategies where users can develop fully functional prototypes in an open-source and mixed-media environment. Each living lab is carrying out a series of self-standing projects on context-dependent challenges, with the help of new technologies. Projects act in order to activate a series of services, inspired by social innovation solutions, to regenerate the urban communities that live in these places. The final aim of the project is to help people design micro solutions for their problems.

Designs of the Time (Dott) is an example that is the opposite of the Malmo case study, because it represents a top-down strategy for introducing design as culture of innovation for cities and regions. Dott07 and Dott09 are the two editions led by the UK Design Council, a highly qualified actor in the field of design, operating from 2006 to deliver solutions for societal challenges embedded in UK urban areas. Dott07, which started in 2007, was delivered by the regional development agency for the North East of England (One North East), without the involvement of the central government. The first year of the program consisted in evaluating current community initiatives in the region, and seven core projects were short-listed for in-depth action from a list of 200 projects. In the second year of the program, the design teams examined new tools and platforms for creating sustainable and innovative solutions to complex societal problems through design. The seven short-listed projects were Alzheimer100 (dementia), DaSH (sexual health), OurNewSchool (building new schools), Low Carb Lane (domestic energy), New Work (for improving the day-to-day experiences of SMEs), Move Me (rural mobility), and Urban Farming (exploring local food systems). The first Dott was led by Program Director John Thackara. The second and final program, carried out in Cornwall during 2009–2010, was led by Andrea Siodmok. The key attributes of both programs were a series of 20 citizen projects, a skills program, and policy recommendations. The Design Council, Cornwall Council, University College Falmouth, and the Technology Strategy Board were partners behind Dott in Cornwall and the Isles of Scilly during 2009–2010. Dott worked with citizens to help them co-design solutions to the daily problems they faced. The challenges explored included what design can do to reduce ecological footprint, how to improve directions to new employment opportunities relevant to the economy and society of twenty-first-century Cornwall, how to help older people find new positions and

stay in their jobs for longer, and how to use design to help push quality Cornish produce into the local and global spotlight. Although most of the individual projects were small-scale, they were real-life examples of communities teaming up with designers to create practical solutions to important issues affecting their living environment.

This project proposed a design-driven amplification method in order to improve and expand the capacity of territories and communities to recognize and solve local problems, using design to envision solutions. Dott can be described as a series of creative and grassroots community design projects, intended to improve design awareness at different levels of society and to stimulate social, environmental, and economic innovation in a local territory (Tackara 2007).

Projects like these are challenging the traditional design project format and are based on building long-term working relations between diverse groups and actors in society and on encouraging mutual learning between them (Di Salvo 2012; Brown 2009; Brown and Wyatt 2010). At a practical level, they emphasize the processes that typically start by connecting to diverse grassroots organizations in a territorial unit (a neighborhood, a rural area, a street, a square) and creating an understanding of their ongoing everyday activities and of how these could potentially support service and social innovation. In terms of vision, they stress the importance of allowing a plurality of voices, a flexible allocation of resources and time, how experimentation and innovation can emerge from the continuous matchmaking of diverse actors, and their needs and competences (innovation as a set of continuous and ongoing relational processes, rather than as a fixed technical system).

Although the notion of starting from the context is often seen as starting from the physical spaces people live or operate in, in this new wave of projects, it gains a new meaning, especially in connection with social innovation (Murray et al. 2010; Norman 2012). In addition to looking at the material aspects of innovation (first step), these projects also try to create an understanding of existing and potential social relations in the area, by mapping the actors and the existing initiatives that can become potential resources for innovation. The second step is to consider connections to other initiatives in the city by identifying common issues and joint experiments. Social capital and learning between disparate groups will increase through these experiments and new social infrastructure is built (Latour 2005, 2010). Projects like these are pushing design to the forefront of innovation of public services and policy-making.

5.2 Design for Public Services and Policy-Making

Although the current types of city challenges and problems represent new opportunities for design, they also illustrate the limits of welfare services bound in twentieth-century models, based on the assumption that the state delivers services to passive citizens or commissions specified solutions to well-defined problems. Some of the

most urgent and costly challenges facing welfare systems are those that require an understanding of the personal, contextual, and invariably multidimensional aspects of people's real lives. Others require types of services that are able to engage and collaborate more productively with people, while others build on individual and social assets to create useful change.

Design is now commonly seen to have important contributions to make in helping public organizations face these challenges, which is testified by the number of "labs" that have been set up across the world. The purpose of these labs is to introduce an experimental approach to building knowledge and creating system change, to address the challenges facing governments and citizens. This is pushing design into the upper echelons of governments, right into the systems, institutions, and rhetorics of public organization across the world.

Different projects and programs are paying more attention to systemic levels and are trying to explore how design could potentially have an impact on larger systems and, especially, how design could reach into the public sector and into municipal offices (Bason 2010; Christiansen and Bunt 2012; Botero and Saad-Sulonen 2013; Manzini and Staszowski: 2013; Deserti and Rizzo 2015).

In 2012, the European Design Leadership Board's Design for Growth and Prosperity report called for designers in residence in EU institutions and member states to increase the design skills of public sector administrators, so that design methods could be used for effective policy-making. In the meantime, in the United Kingdom, the *Civil Service Reform Plan* (HM Government 2012) recognized the value of lab working methods, quoting MindLab in Denmark as an example of the approach. The APDIG Design Commission's *Restarting Britain*: *Design and Public Services* report (UK Design Commission 2013) recommended that the Cabinet Office should take responsibility for developing design skills across the government, specifically trailing a multidisciplinary design studio method for policy originating and for a wider drive to equip policy-makers with design skills.

In the United Kingdom, several service design companies, including Livework, Engine, and ThinkPublic, began to apply design methods to social and societal challenges in the early 2000s.

Furthermore, other public institutions in the United Kingdom have started projects involving design companies. For example, the Engine design firm has supported the Kent County Council in designing a new platform for co-creation, whereas the Livework design agency has created services to support hard-to-reach unemployed people. ThinkPublic, a service design company, has used participatory design to engage citizens in identifying challenges and co-designing responses to improve community health and well-being.

This occurred, among other things, with support from the Design Council (2008, 2012), which encouraged the exploration of design use in new social and public contexts through research and demonstration projects. One example was the Design Council's RED research unit, which consisted of professional designers and professionals from disciplines such as policy analysis and social sciences. Burns et al. (2006) described the RED unit's approach, called *transformation design*, as based on involving heterogeneous stakeholders from the beginning through participatory design.

In April 2014 the UK's first Policy Lab was launched. The Lab's theory of change is that using design principles to approach complex problems can result in better outcomes and that training policy-makers in design research methods, including using or commissioning ethnographic research, has the potential to transform the way that policy is made in the government.

There is growing interest in design for public services in the United States as well. It is among the areas of expertise offered by the design firms IDEO, Continuum, and Frog Design. In particular the DESIS Lab in the New School for Design in New York is working in a more European way, by helping local creative communities to develop collaborative services and sustainable lifestyles. In the research program known as Public & Collaborative NYC, the DESIS Lab explores what role design can play in building bridges between city government and people in the creation of social innovation (Staszowski et al. 2013).

An example of this new role for design is the case of "La 27e Région" developed in France. It represents one of the most interesting design-led projects developed by an independent organization that explores, in partnership with the central government (which is funding the initiative), how design approaches can influence policy development in the public sector in France. In 2008, La 27e Région started its activities as a not-for-profit "do-tank," working in, with, and for the 26 French regional governments.

La 27e Région's strategy, which has been characterized as friendly hacking, builds on embedding multidisciplinary teams, including designers, who can empower civil servants in diverse public organizations for shorter or longer periods. They use the term "hacking" because it "signifies the intent to challenge the robustness of public policy instruments" (Jégou et al. 2013, pg. 6). The final aim of the project is to disseminate design knowledge competences and skills to empower people.

They have all been working closely with a growing community of service designers, architects, and sociologists gradually engaged in design for public policy. After a first set of 16 tests spread all across the country and dealing with issues such as education, health, mobility, democracy, and procurement ("Territoires en Résidences" program, started in 2009) and after four prototypes of "public innovation labs" embedded in regional governments ("La Transfo" program, launched in 2011), La 27e Région is now entering a new phase. In partnership with the French state and local authorities who have decided to unify their efforts, La 27e Région has set up a new 4-year program, Re-acteur Public, led by a large consortium of different public institutions. Re-acteur Public is designed as a vehicle to scale up the methods, processes, and thinking developed during the past 6 years. Re-acteur Public was officially launched in May 2014 by the French Minister of Reform, together with representatives of French public administrations (both local and national). The consortium aims to explore four areas of work until 2017: skills (building design capacities among civil servants through training sessions), community (bringing together all the practitioners of design for public policy), future (exploring possible futures of the administration), and publishing (launching a collection of books, cases, and prototypes) to scale up the methods, processes, and thinking developed during the past 6 years.

During 2014 La 27e Région has also established a collaboration with the National School of Administration (Ecole Nationale d'Administration), through the Reacteur Public project, so that they can include design for policy in their programs.

However, it is clear that all these initiatives and programs start from working on the implementation of design in the public sector, by designing and redesigning public services with the aim of improving the life quality of people and suggesting a social role for design. Moreover, they represent attempts to apply design on policy as a dynamic object.

In these projects, design is playing a more transformative role, which argues for challenging established structures and triggers changes in public organizations and in how they produce policy, instead of focusing on productivity, efficiency, users' experience, or improving services within existing societal structures (Deserti and Rizzo 2015; Botero and Saad-Sulonen 2013; DiSalvo 2012).

Projects like these show how fruitful design is with regard to planning policy, since it takes the dynamic relationship as the premise in their development (Christiansen and Bunt 2012; Brown and Wyatt 2010; Burns et al. 2006). Policies can no longer be seen in their own right, but only make sense when seen in relation to their practical outlook and consequences. Unlike the traditional understanding of policy-making and governance as the rational development of models, design is predisposed to more iterative creation and stewardship, closing the gap between model development and implementation. Design as a discipline is also more at ease with complexity and uncertainty and is therefore commonly used as an innovation method. Though oversimplified, one of the core strengths of a design approach is that it starts from understanding the architecture of the problem, focusing on the actual causes and consequences involved, as well as on the interconnected systems and networks involved in dealing with it. Taking on different perspectives, asking new questions and reframing challenges can introduce innovation into thought or action processes by creating a tension with common interpretation. By asking different questions, a design approach can point to different trajectories for addressing the problem.

Moreover, this new wave of projects is disseminating a new view on policy-making as "experiments in progress." The application of design culture to policy-making remains an untapped opportunity in relation to policy and decision-making. However, the current trend for involving designers and design-based approaches in public service planning to deliver public policies creates new opportunities, which in itself is a huge opportunity to embed design into the policy-making process. A lot of work has to be done to find ways to measure the induced changes and their impact effect, at service level and at organization level.

Thus, the idea of experimentation in relation to public governance and policy development has risk connotations. To a large extent, this is understandable, given the important responsibility of ensuring public accountability and civil rights through trustworthy bureaucratic procedures and structures. Therefore, innovation, which has an unknown and unpredictable outcome, is seen as risky in contrast to

known, predictable outcomes (and familiar failures) of current practices, whether they are successful or not. As a consequence, much innovation still tends to be carried outside of the core operations of public organizations. Design culture and methods help to create a legitimate space for experimentation that contains risks and expectation and supports learning from (low-cost) failure where the cause of a problem is unknown or where practices are still evolving. This is different from running an initial pilot prior to launching a full program, which is often how public policies are developed (and which has its own risks). When pilot projects have a high profile, political capital, and considerable investment, failure can come at a considerable cost. The expectation from experimentation is not necessarily success, but learning from practice. The concept of prototype is relevant here. It changes expectations of performance and permanence of public services, given the signal of early-stage development and ongoing learning. Prototypes not only welcome feedback but proactively encourage challenges and critique from the public, potential users, colleagues, partners, experts, and other relevant actors. In this way imperfection becomes a legitimate and even expected part of the processes devoted to experimental polices.

5.3 Rethinking the Practice of Policy by Designing New Services

In the second part of the chapter, the Campus Sostenibile project is discussed as an example of a long-term, design-led project which aimed at developing new solutions for some of the societal problems that affected the Città Studi Milano neighborhood. In addition the project exemplifies a long phase of experimentation with a neighborhood-based coproduction network and the process of interaction between the network and the Municipality of Milan, thanks to the project's intermediation.

Campus Sostenibile was initiated to explore how to set up in a university a platform that could facilitate behavior transformation toward sustainability and that would be open to a neighborhood in the city of Milan. Fundamental strategic decisions were made by the management of the Politecnico di Milano in the adoption of a long-term perspective that could go beyond single projects, to lead a very transformative approach to participation and people's behavior in the campus as well as in the local communities of the neighborhood. At the beginning the project was not intended to be an instrument of transformation and urban regeneration. It was supposed to be a platform for supporting a dialogue between the people in the campus and the people in the neighborhood.

In the rest of the chapter, details on the overall project, from the initial idea to the reconfiguration of Campus Sostenibile as a design-driven living lab, are discussed. Next, the initial idea, motivation, and core solution and how they have

been sustained through a strategy of synergies with different scale projects are described. They are followed by a series of design intervention descriptions with details on performance, scales, and funding schemes. Finally, lessons learned with respect to design as complex participatory practices are summarized.

5.3.1 A Story of a Complex Participatory Design Process Toward a Transformation of a Neighborhood in Milan

The Campus Sostenibile project tells the story of a complex participatory design process (Deserti and Rizzo; 2014) as the continuous open innovation strategy implemented by a public actor experimenting with open innovation in urban context. The elements that this story put together are a university, namely, the Politecnico di Milano (which is located in one of the largest neighborhoods in Milan, Città Studi); the citizens who live in the neighborhood; the university communities (students, professors, and administrative staff); and a series of private and public actors that operate in that context, the Peripheria European project (no. 271015) funded under the CIP-IP program for the development of the smart city paradigm.

When Campus Sostenibile started, the idea that the university could become the engine of the neighborhood transformation was not clearly declared. In fact it was the Peripheria project approach (Marsh 2013) that created the conditions to set up and generate organizational changes toward sustainability. It did so by exploiting open innovation as the most suitable form of collaboration between the university and the Città Studi neighborhood.

In this context, participatory design was introduced as a way of envisioning possible future solutions, by creating strong connections with the network of stakeholders belonging to the neighborhood and establishing a long-term engagement with local communities, which leads to the emergence of new practices and new opportunities for all.

The final result of this process has been the implementation of an intangible infrastructure, which can be also defined as an urban living lab (Concilio et al. 2012), in which local stakeholders continuously co-design and coproduce solutions to address situated challenges in the neighborhood. Designers work with stakeholders to identify the emerging needs and to create digital and physical platforms that can enable participation and coproduction, being open to different project development directions and perusing the sustainability of the designed solutions.

The case describes the peculiar conditions and resources of the local communities engaged in this long-term experiment at the beginning and at the end. The challenge is to provide evidence of what can be done beyond the classical co-design exercises, activities, and tools, with a twofold aim: (i) addressing the context's problems and (ii) establishing a long-lasting strategy of innovation for that context.

5.3.2 *Campus Sostenibile Program: The Core Solution and Its Further Development*

The idea of the Campus Sostenibile project started in October 2010 as part of the strategic vision of the new management of the Politecnico di Milano. The initiative announced in March 2010, during the opening of the academic year, initially aimed to improve the level of sustainability of the university, i.e., the sustainability of behaviors of the institution and the behavior of its related communities.

The program started from the most ancient campus of the university, the Leonardo Campus, located in the center of a large city neighborhood, Città Studi.

The first year of the program was spent designing new policies, rules, and services to encourage the people who were using the campus to change their behaviors and act in a more sustainable way with regard to energy consumption and building use in particular (two of the main issues). In 2010 the Peripheria European project had been just launched, with the aim of applying co-design methodologies to the design of smart services that were to be experimented in five different European cities. The project heavily relied on a design-thinking approach as the methodology to be applied in the design of smart services. The Politecnico di Milano, with the departments of Design and of Urban Planning, was included in the project as the partner that would provide the skills needed in the project and that would lead the co-design activities in the five city contexts.

At the end of 2010, the management decided to open the Campus Sostenibile to the support of its internal research community (engineers, designers, and architects). The idea was that many researchers in different fields are conducting activities that could be useful for the Institution for which they work as well, because they provide solutions, ideas, and knowledge that can been applied to achieve the objectives of the Campus Sostenibile program.

The group of researchers that was working for Peripheria immediately decided to join as an active member of the Campus Sostenibile program. The fact that the Campus Leonardo da Vinci was located in the Città Studi neighborhood was a great occasion for Peripheria to experiment co-design in a specific element of the city of Milan.

The Peripheria research team proposed to try a series of small-scale experiments, to open the scientific knowledge of the university to the citizens of that neighborhood, in order to start co-design processes to address some of the context's problems.

Relying on this main assumption, the goal perused with the synergy between Campus Sostenibile and the Peripheria project became to transform the campus into an urban experimental place where scientific knowledge is coproduced. Thanks to this vision, Campus Sostenibile planned to open the scientific world to a wider community in order to transform small-scale projects into occasions for experimenting the production of scientific knowledge as a large public collective

experience. The collaboration started with the general idea of renovating and innovating the area of the Leonardo Campus in a sustainable perspective.

The original feature of the Peripheria project, compared to other smart city projects that the European Commission was funding in 2010, was the involvement of specific competences in urban planning and design for the conception of new, people-centered services, which would also represent "smartness" as the city's ability to develop solutions in line with the citizens' needs and desires. Here the Politecnico's competences on service design and urban planning found a new and tested common ground for research by further developing the idea of collaborative services (Baek et al. 2010; Prahalad and Krishnan 2008; von Hippel et al. 2011), because in urban contexts these services are the results of co-design and coproduction initiatives. From the Peripheria project, a new vision on the role that Politecnico could have as a public agency that operates within a city was raised in Campus Sostenibile as well. Città Studi neighborhood became an area for conducting small-scale collaboration experiments between the university and the other actors of the neighborhood, mediated by co-design techniques and with the aim of solving real problems.

By the time Peripheria started to work in the Città Studi neighborhood, the Campus Sostenibile program was already under way. However, it was experiencing difficulties in establishing channels to communicate and interact with the external environment, as well as with the internal communities, because it lacked a strategy and an approach for stakeholder and community involvement.

The first action that the Peripheria team decided on was the creation of an official table around which to meet stakeholders from the neighborhood. At the beginning of 2011, a "City Table" for Peripheria and Campus Sostenibile was opened, led by the researchers from the Design and Urban Planning departments, with representatives from the neighborhood (associations, schools, municipality). The table met on a weekly basis to discuss the problems of the neighborhood. It was the first time the Politecnico had opened its doors to the local outside communities.

After two exploratory workshops, the involved stakeholders decided to focus the table's attention on the Leonardo da Vinci Square.

This is a square that for many reasons has always been a kind of contradiction for the neighborhood. It is located just in front of the Rectorate of the Politecnico, but it is a public area under the municipality's responsibility. It is cut in the middle by a street where cars can cross. At the time Peripheria started, half of the square was a parking area for Politecnico staff, and the rest was a free area to walk in, located right in front a primary school. In the night the square is not under surveillance and it is considered a dangerous site. Many buildings overlook the square and the people that live there complain about the fact that the square is a park in the day and an empty and dangerous place in the night.

It was evident that the square was a sensitive issue for many actors of the neighborhood. The Politecnico was interested in changing the bad perception that citizens had of the university. Using the square as a park was perceived, by the other actors, as an abuse which the neighborhood was not prepared to put up with. The municipality and the inhabitants around the square were interested in transforming

it into a safe place. The primary school on the other side of the square was interested in using it as an open area for children to play safely in. From the first of the table meetings, one topic appeared to work well to implement the synergy between the Campus Sostenibile program and Peripheria project, i.e., the transformation of Piazza Leonardo da Vinci. With this goal in mind, an initial network of stakeholders started to co-design in order to deal with a first challenge, which meant exploring the campus of the Politecnico di Milano as an experimental context for socio-spatial transformation.

The initial stakeholder network then started to disseminate the challenge and to design a series of events and actions with the aim of helping interested groups to emerge and work on the challenge, capturing and supporting emerging processes of alignment at different levels around the co-designed solutions to be coproduced in the real context.

The interventions required mobilizing a number of stakeholders and asking them to invest time and resources. This implied the expectations were often quite high, leading to a number of issues related to the actual results of each prototype, with failures being difficult to accept and manage. At the end of July 2011, three different networks of stakeholders were established with the aim of working on the challenge and developing design projects to answer it.

The strategy of developing a long-term engagement progressed through the design of service prototypes that put the square at the center of the challenge's solution. The network emerging around the Piazza Leonardo da Vinci theme was the most active. This was mainly due to the value assigned by many citizens, organizations, school, and institutions to this space. Despite this wide and deep interest, this network was the most risky because it was becoming more and more a sort of test for the municipality, which had to accept a new mode for making decisions, dealing with different and diverse visions, dialoguing with new actors, and accepting the Politecnico as a strong interlocutor that was not prepared to have the role of technical consultant as its only role.

During 2012 many ideas were produced around the topic of how to transform the square. Two stakeholders' networks emerged around two main projects:

- The transformation of the Leonardo da Vinci Square into a pedestrian area for children to play in and for students, but also as a venue to organize cultural events for the citizens
- A long-term project that would catalyze sport events for adults and for children in the Leonardo da Vinci Square

The Peripheria project ended in May 2013. In June 2013 the first Leonardo da Vinci sport program was launched, and in January 2014 the Politecnico decided to transform the part of the square under its responsibility from a park into a garden for the students (many Polimi staff are still complaining against this decision, claiming they have nowhere to park their cars). In spring 2014 the municipality experimented for 2 weeks during which the square was closed to cars and became a place for sport.

The Leonardo da Vinci Square networks described above have been the most relevant emerging from the Campus Sostenibile program.

At the moment a clear success in reaching the challenge objective cannot be announced, but the fact that the municipality accepted a different temporary mode for decision-making and the fact that it accepted to "test" some public functions in the square area before implementing any predetermined transformation are good signals.

Currently Campus Sostenibile has applied for the European Network of Living Labs (ENOLL) call for applications. The networks of stakeholders around the square under Politecnico leadership are continuing its action of continuous experimentations, i.e., new service prototypes, which can manage a smart use of the square from private citizens (Stick Around app) or that can implement mutual help processes between students and people from the neighborhood, have been developed or are under experimentation.

5.4   Case Discussion

Campus Sostenibile as a design-led project has focused more and more on building alliances among one leading partner (the Politecnico) and the internal stakeholders, the citizens, the representatives of the public sector in the neighborhood (the school, the municipality), and the representatives of the private sector (small shops, bars, and restaurant) with the aim of having an impact on the processes of decision-making and transformation for the Leonardo da Vinci Square. From this point of view, the first elements of discussion that the case allows to focus on are the specific characteristics of its initial configuration and the vision behind the processes of alignment that the project implemented.

The case of Campus Sostenibile represents a project in which one of the actors involved takes the leadership of guiding the design process, by envisioning a design project as an enabling platform for interplay between bottom-up experiments and top-down policy-making and regulation frameworks. The second element of the case on which to reflect is the nature of the process of building infrastructure. This process has also been discussed by Pell Ehn and his colleagues in many papers (Björgvinsson et al. 2012; Hillgren et al. 2011; Ehn 2008) as the process through which design helps to build linkages and supports small-scale initiatives to become connected (quotation), but also in the meaning of Manzini and Rizzo (2011) who conceive infrastructure also as the process of designing a design project to set the precondition in which to experiment with policy and people needs. "Infrastructures" basically mean that Campus Sostenibile cultivated long-term working relationships with diverse actors and slowly built a stable designing network that can change configuration with respect to the specificity of the challenges faced, the interests and needs of the different stakeholders, the constraints, as well as the affordances that the socioeconomic and regulation framework imposes and offers. Thanks to this long-term perspective, Campus Sostenibile built trust among diverse stakeholders, supported mutual learning, slowly gained the authorities' attention, and worked on a more systemic level.

The starting point for Campus Sostenibile has been quite different from the projects mentioned above. La 27e Région had several politicians sitting on their board, and their friendly hacking is commissioned by the public sector and supported by formal agreements that give them a mandate to work inside these organizations. Malmo Living Lab emerges, by contrast, from the fact that it started and rooted its initial work in local communities. Dott07 and Dott09 seem to represent attempts of a strong player like the Design Council to push design under the eyes of policy-makers and the public sector as the new approach to innovation.

Considered together, these projects can be read as a "framework program" (Manzini and Rizzo 2011) for cities, a large supporting structure that could move local cases, experiments, and projects out of isolation and increase their capacity to impact on the development of a new vision for cities.

When contradictions emerge between bottom-up and top-down in framework projects, processes of alignment start with the aim of producing a possible change in the bigger picture, by trying to modify regulations, work procedures and cultures, public policy, and indicators of project success (Deserti and Rizzo 2015).

Framework design projects recognize that there is a need for a more permissive innovation culture in the public sector and in policy-making, so that stakeholders can be allowed to experiment (and even to fail). To support these processes, they use the concept of prototyping quite extensively. But at the same time framework projects also recognize the value of discussing how regulations could be stretched and how things can be done without breaking any regulations or laws. To make this possible, framework projects develop broader vision and scenarios in which to discuss policy and through which inform policy decision-making.

All considered, the framework project reveals a model of conduction, here presented as a re-elaboration of a first model discussed in Manzini and Rizzo (2011), which reorganizes design activities in two larger phases.

What emerges here as original compared to the first version of the model is the idea of complex participatory design processes as the experimentations of coproduction networks along three implementation phases: infrastructuring, experimenting, and strengthening. Listed below are the phases of the model:

1. *Analyzing*. The exploration and mapping of existing solutions and initiatives oriented toward the inspiration of new solutions or systems of solutions. It includes the identification of a consistent design opportunity for a competitive and innovative solution.
2. *Envisioning*. The development of scenarios, visions, and proposals, used both to define the overall directions to take and to stimulate and align the actors and stakeholders in the development process.
3. *Designing*. The development of the solution through the adoption of participatory design tools supporting interaction and convergence among the involved parties.
4. *Communicating*. The development of presentations, visualizations, communication tools, and actions to inform about the solution before, during, and after its development, with different aims such as convincing potential actors to join or sponsor the initiative, create consensus, foster the adoption of the solution, etc.

5. *Infrastructuring*. The development of digital platforms, toolkits, and other supporting tools and actions (such as knowledge transfer initiatives), to enable the new network of actors to carry on the development process by themselves.
6. *Experimenting*. The solution experimentation in local scale and small scale, including the assessment and the testing of the involved actors' network, to give feedbacks for the assessment of the new idea.
7. *Strengthening*. The activities oriented toward organizing synergies and multiplication effects among different single projects and different elements of the same project.

The model suggests that the design phases (analyzing, envisioning, designing, communicating) are usually followed by a long-term period of experimentation (small-scale experiments) that aim to infrastructure the context of the project through the institutionalization of partnerships that strengthen and deliver sustainable solutions.

5.5   Conclusions

This chapter has discussed a new wave of design projects that are active in cities and territories. They aim to face new societal challenges through a situated approach and extensively applying design culture to experiment new networks and partnerships as infrastructures of a new generation of services that are much closer to society's needs.

Until now these design projects have been presented as top-down or bottom-up initiatives. Actions "from the top" are capable of generating large social transformation, e.g., the experience of La 27e Région, whereas actions "from the bottom" give rise to a multiplicity of local changes, such as the foundation of the Malmo Living Lab in Sweden or Dott07 and Dott09 in the United Kingdom. However, a closer observation indicates that this new generation of design projects, both in its starting move and in its long-term existence, often depends on more complex interactions between very diverse initiatives, where the ones undertaken directly by the people concerned (bottom-up) are often supported by different kinds of intervention by institutions, civic organizations, or companies (top-down). The chapter has discussed these as complex participatory design processes.

Considering these design projects from the perspective of design culture, three main common characteristics can be observed: (1) they aim at provoking transformations at some territorial scales (neighborhood, squares, streets, cities, regions) in order to address context-dependent societal challenges, (2) they share the explicit goal of achieving their objectives by activating networks and partnerships of diverse actors (from citizens to private and public stakeholders) in designing and producing solutions, (3) they have been started and are driven by the explicit intent to investigate design extent and potentialities in dealing with cities; and (4) all of them can be described as infrastructure that permits the interplay between small-scale

initiatives and a broader vision for addressing city societal challenges. From this point of view, framework projects can be described as (Manzini and Rizzo 2011):

> 1. Highly dynamic processes: they include linear co-design processes and consensus building methodologies (i.e. the most traditional view on participatory design), but they can go far beyond them, becoming complex, interconnected but often-contradictory processes. 2. Creative and proactive activities, where the designers' role includes the role of mediator (between different interests) and facilitator (of other participants' ideas and initiatives), but involves more skills and, most importantly, it includes the designers' specificity in terms of creativity and design knowledge (to conceive and realize design initiatives and their correspondent design devices). 3. Complex co-design activities that, to be promoted, sustained and oriented, call for prototypes, mock-ups, design games, models, sketches and other materials: a set of dedicated and designed artifacts.

But from this point of view, framework projects can be described as intermediate playgrounds in which top-down policies leave bottom-up initiatives the room and the time to experiment with failure and success by taking advantage of a long-term learning process (Deserti and Rizzo 2015).

Each small-scale experiment that moves from the stage of social invention and working prototype and evolves to become a robust and replicable solution asks for a positive interplay among bottom-up initiatives (by grassroots associations), peer-to-peer exchanges (between similar initiatives), and top-down interventions (by local authorities, sensible businesses, other nonprofit associations). A key feature of these new design projects is the larger sphere of intervention that comes about creating a new, productive, quasi-institutional environment, which is held up by various actors, different power relations, and interconnected spaces of meaning and interpretation. These environments challenge the type of role public authorities have. Here the public state recognizes itself as one knowledgeable actor among many and therefore deliberately seeks to draw broadly on the knowledge and efforts of various actors of society as a whole.

Finally, it might sound like a revolution if design-led innovation were really to affect and impact governments around the world by complementary internal organizational cultures with design-based culture. As also noticed by Bason (2012) along this attempt, design has to rise to three main challenges:

- *The institutionalization of design environments within public organizations*.

  Despite the fact that many entities like design labs, centers, and teams have been established in many countries in Europe (United Kingdom, Denmark, Finland), public organization still struggles with the idea that design is an area of competences to be legitimated within public organizations and that it is also something to invest in, in order to ensure funding, anchor change in the organization, get management buy-in, and actually execute the new ideas and solutions into real prototypes.
- *The empowerment of public organizations through long-term processes of capacity building*.

  The introduction of design culture in the public sector is in its initial phases. Design methods and tools are still largely unknown to public institutions, and design knowledge is still far from having entered the public organizations at a

large scale, affecting their daily processes and their underpinned culture. Campus Sostenibile shows the possibility of building an intermediate playground, for a dynamic interaction between the operative and the strategic levels of organizational change. The project shifts the attention on how to obtain a wider impact through the introduction of new policies to design and experiment new ways of delivering services, using the experiments to assess the policies and to foster the change of the involved organizations (macro level).

- *The organizational change issues are actually unknown to most of the designers.*
     The cases show how the conception and delivery of the new services are bound to the creation of networks and partnerships which, in turn, requires the development of new policies. Some of the service design tools, such as the "actor mapping" and the "stakeholders' matrix," apparently put both feet in the field of organizational change without a sound understanding of its complexity.

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