

# Exploring the interplay between urban governance and smart services codesign<sup>1</sup>

Grazia Concilio<sup>2</sup>, Alessandro Deserti<sup>2</sup>, Francesca Rizzo<sup>3</sup>

<sup>1</sup>DAStU Department, Politecnico of Milano, Via Golgi 39,  
20133 Milano, Italy

<sup>2</sup>Design Department, Politecnico of Milano, Via Durando 38/a, 20158 Milano

<sup>3</sup>Department of Architecture, University of Bologna, Via del risorgimento 2, 40136 Bologna

**Abstract.** The large spreading of e-democracy and e-participatory tools and environments showed, and is still showing, that technologies offer new direction for dealing with the challenge of scaling the deliberative democracy perspective up to the urban governance scale [24] [37]. The recent growth of Urban Living Labs and Human Smart City initiatives is disclosing a promising bridge between the micro-scale of decision and the mechanisms of urban governance [34] [35] [9]. In coherence with these perspectives, the article reports on the interplay between urban governance and the co-design of smart services in urban transformation as it has been observed and analysed in the two European research projects Periphèria ([www.periphèria.eu](http://www.periphèria.eu), Grant Agreement No.: 271015) and MyNeighbourhood ([www.my-neighbourhood.eu](http://www.my-neighbourhood.eu), Grant agreement no.: 325227). The article also discusses the value of service co-design as a strategic practice to experiment new participatory governance in smart cities.

**Keywords:** co-design, planning, public services, urban governance

## 1 Introduction

Urban transformation is widely recognized as a complex phenomenon, rich in uncertainty. It is the unpredictable consequence of the complex interplay between urban forces (both top-down or bottom-up), urban resources (spatial, social, political, economic, infrastructural, and cognitive) and transformation opportunities (endogenous or exogenous).

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This awareness has since long produced a significant attention on the role of deliberation [17] [18] [1] as well as on the related deliberative democracy models, as relevant for the infrastructuring of urban governance. While deliberation appears operational at the scale of people interaction, small group work and micro-decision making, it is still far from representing a decision making resource at the scale of urban collectivity [20] [16] [17]. It is more and more clear that:

“Deliberative democracy is a model growing out of small-scale face-to-face interactions. To apply it to any larger scale - even modest-sized towns, much less the world at large - requires some different institutional structure. Deliberative democrats need to find ways of linking the virtues of small-scale deliberation with decision making for larger scale society” [19].

The large spreading of e-democracy and e-participatory tools and environments showed, and is still showing, that technologies offer new directions for dealing with the challenge of scaling the deliberative democracy perspective up to the urban governance scale [24] [37].

At the same time, the recent growth of Urban Living Labs (ULLs) and Human Smart City initiatives is disclosing a promising bridge between the micro-scale of decision and the mechanisms of urban governance [34] [35] [9]. This bridge is represented by collaborative and creative environments [28] [15] [25] where processes of smart service co-design take place through dialogic interaction with and among citizens within a situated and cultural-specific frame [40] [22].

As a response to new emerging needs and ways of generating value, during the last decades the design discipline - traditionally bound to the development of tangible artifacts (“posters or toasters”) - has expanded its focus on intangible artifacts such as signs, interactions, processes, and services [7]. This evolution entailed the generation of a wide set of tools and methods, primarily meant to help designers giving shape to intangible outcomes, such as processes and interactions, and to their tangible substrates, usually called “touch-points” in the service sciences. The active involvement of users is the main trait of originality in the designerly approach to services:

“Service design is a user-centered, participatory practice, based on the adoption of co-design methods to involve prospective users in the development of solutions” [32]. In quite a few cases giving shape to these new intangible outcomes requires the contextual development of a network of actors who will contribute to their realization [14]: the need to align on a vision actors and stakeholders who may have different and sometimes conflicting needs and goals characterizes the design practice in some of its most recent developments.

Complex participatory methods were thus developed and experimented in the field of service design, giving birth to a wide set of tools for the involvement of the actors, the construction of the networks, the definition of the underpinned business models, the prototyping and testing of the services [8].

This evolution completely changed the causal relations between products and services, by introducing a new generation of products that are designed “as consequences” of the services they are meant to support. It also led to a considerable expansion of the fields of interest of the design discipline, introducing design methods and thinking into different contexts, starting a fruitful dialogue with other disciplines.

Among these, one of the most interesting is the relation with urban planning, that has a long tradition of dialogue with actors and stakeholders, primarily based on the idea of aligning municipalities and citizens on the strategic decisions bound to the transformation of the urban environment.

The massive introduction of digital services, which generated a new intangible layer of city, was the natural meeting place for design and urban planning towards smart cities and services management. The concept of “smart city” boosted the relation between the two disciplines, and introduced the idea that the development of contemporary cities must be based on the capability to design and manage the interaction between the traditional physical structure and the new digital information infrastructure, through the introduction of “smart” service ideas and solutions responding to the needs emerging from citizens experiences.

These new urban services invert the relation between the material substrate and the digital layer of the city: they do not just fit in the existing spaces, but actually modify the physical substrate and remodel the city by changing the ways in which people interact.

## **2 My Neighborhood and Periphèria Projects**

In coherence with these perspectives, the article reports on the interplay between urban governance and smart services co-design in urban transformation as it has been observed and analysed in the two European projects Periphèria ([www.periphèria.eu](http://www.periphèria.eu)) and MyNeighbourhood ([www.my-neighbourhood.eu](http://www.my-neighbourhood.eu)). It also discusses the value of service co-design as a strategic practice to experiment new participatory governance in smart cities.

Both projects have shown as Living Labs may represent complex deliberative environments where to experiment new opportunities to re-think urban governance models and practices, integrating the macro scale of policy making and the micro scale of public participation.

Through the small co-design activities conducted in such contexts both Periphèria and MyNeighbourhood developed innovative partnerships, deeply challenging public institutions by involving them in unprecedented dialogic and interaction activities.

Both projects worked on the assumption that by enhancing the deliberative side of the service design processes taking place in Living Lab environments we can fill in the effectiveness gap between micro and macro scales of urban decisions.

Specifically, service design emerges as a process that is able to generate unexplored governance frameworks, “naturally” expanding deliberation potentials from the micro to the macro scale of urban decisions [9].

This assumption requires the introduction of a systemic perspective, where the role of society and individuals is recognized as integrated with that of technology. This new integrated perspective gives the opportunity of interacting and dialoguing with citizens without losing contact with the real problems (bottom-up trajectory), while at the same time defining priorities and building solutions around a meaningful long-term vision beyond the acknowledgement of local needs (top-down approach), thus revealing unexplored space for deliberative governance.

## 2.1 The Periphèria Pilot Experiment in Milano

Periphèria is a European project that ended in 2013 after 30 months of experimentation of a bottom-up approach to build up new services for smart cities.

Within Periphèria the development of sustainable collaborative processes among local citizens, institutions, private stakeholders and the communities of developers has been based on the idea of “co-production” as an approach to build smarter cities through forms of “open innovation”.

Periphèria pointed out that in smart city contexts, the participation of stakeholders in the ideation, construction and management of services is bound to the real incentive in becoming involved as “co-producers”, having access to creative communities, acquiring new skills, employment opportunities, and service choices that address their real needs and wishes, potentially leading to a better quality of life and better places to live in. But generating long-term benefits asks for making co-production more sustainable and resilient in both time and relational capital, by embedding a pro-active involvement of the stakeholders in all aspects of the design and creation of the urban services.

Fostering new principles of mutual partnership, so that people are recognised as assets and all their work that makes the city more sustainable and more socially just is valued, should become a principle. This requires sharing the responsibilities for providing local services between the public authorities and the local citizenry, introducing a new rationale bound to the Public-Private-People Partnerships as results of complex participatory design processes taking place in the sphere of the public services [5].

Periphèria attempted to address these challenges by taking over the notion of applying open innovation for building a smarter city on the basis of citizens' engagement in urban networking and inter-institutional relations. A key trust of the project Consortium was that if smart cities are to deliver a better quality of life in more attractive urban areas, new ways of engaging with the citizens and the urban actors at micro scales are necessary.

This new frame is not just meant to provide a better inclusion of the citizens but also to empower them as a catalyst in transforming the dynamics of the urban life through the development and management of new collaborative city services. Using the potential of new bottom-up approaches and Living Labs methodologies, open innovation models have been re-elaborated as complex open and participated design processes.

This has led to create an experimental set of self-standing and sustainable services, based on the interaction of citizens and public institutions and conceived as a synthesis of different urban actors' interests and roles.

The outcome of these processes is a radical shift in the nature and focus of the city services: creating a smart community with smart citizens, smart government, smart developers and smart service owners was identified as the most effective tool for establishing new, dynamic and viable relationships in Periphèria's smart city. In this perspective, the adoption of a new model of service co-development generates services where the end-users tend to become collaborative co-producers.

On the basis of these assumptions the Periphèria Milan Pilot started in 2011, when Politecnico di Milano decided to activate the project “Città Studi. Campus

Sostenibile” ([www.campussostenibile.it](http://www.campussostenibile.it)). The pilot experiment took into consideration that academic campuses are relevant urban areas where the kind of knowledge circulating and the attitude towards experimentation makes them suitable for LL approaches.

Coherently with this vision, the main stakeholders involved in this first phase of the project were the academics, the students and all those directly connected to the campus life. Two main drivers were considered as activators of the campus community commitment: 1) conditions, situations, mechanisms, logistics, and practices making the campus an unsustainable environment; 2) ideas, blue prints, visions, analysis and hypotheses developed by the campus communities to transform it into a sustainable environment.

We can now say that two main service ideas developed within the project are today mature enough to be discussed as stable services. Both of them, namely the “TOC TOC” and the “&CO” initiatives, are examples of bottom-up service co-design experiences, coordinated by the local research partner but mainly carried on by the students. These two experiences have involved many people inside and outside the academic life and are in the phase of service testing. These experiences were able to involve new actors, some of them more actively (&CO: some labs of PoliMi, printer services at PoliMi or in the Città Studi area; TOC TOC: new students and groups of citizens, the Milan innovation and incubator agency, offices of the EXPO 2015), some less (&CO: some shops in the Città Studi area, some small local handcraft activities).

### *The TOC TOC service idea*

TOC TOC is a collaborative service adopting a LL approach with the aim of creating a living community behind the “Campus Sostenibile” project. The idea is to involve the community that surrounds the campus (citizens, local retailers, schools, municipalities, NGOs) in a service that supports exchanges of material and immaterial things among people by exploiting a web platform and a mobile app.

The mission of the service is twofold: (i) foster sociability through a web-based living community for mutual help; (ii) reduce consumption by re-use and exchange.

Currently the service is at a prototypical stage (see fig. 1) that has been developed by activating a robust process of co-design with students, professors, people from the neighbourhood and software developers: it started from understanding how does exchange take place between people that do not know each other, and continued by co-designing the business model, the proper features for the marketing strategy and the most suitable support technologies (smart matching system, open system – APIs).



Fig.1. The TOC TOC app prototype

*The &CO service idea*

&CO project aims at reducing the amount of waste in big and middle-sized cities by lengthening the life-cycle of products. The initial goal of the &CO project was quite large: the idea of working on the reduction of waste was focused thanks to a process of co-design with the different communities (students, inhabitants etc.) in the Città Studi neighbourhood.

In particular, &CO project tries to adopt a LL approach to the specific challenge of changing the established behaviour of people living in the Campus. Its aim is to reduce unsustainable behaviours by changing the life-styles and the ways of use (see fig. 2). Currently the project is under further development in order to evaluate its scalability.



Fig. 2. The &CO service storyboard

## 2.2 The MyNeighbourhood Pilot Experiment in Milano

MyNeighbourhood project started in January 2013 with the goal of applying service design methods and tools in 4 different European neighborhoods to identify and support the establishment and the upscale of grassroots and community-based initiatives, through the adoption of a web-based service platform. The project is operating in a typical ICT research area, introducing the idea that advanced participatory design methods could make the difference in the level of innovation of the proposed solutions, since the development process starts from people and not from the available technological paradigm. The work carried out within the pilot experiments in the first months has been structured in 4 typical design steps or phases: exploration, sense making, idea generation and service design.

The MyNeighbourhood experimentation is bound to the Human Smart City (HSC) paradigm as elaborated in the Periphèria research project [35] [36] [30]. HSC paradigm moves from recognizing cities' smartness in the capability of cities to include citizen-driven initiatives as concurrent city infrastructures, together with the physical and technological layers.

At the core of the HSC vision there is the human perspective, as elaborated by the design culture [10] that considers that participatory design approaches to the development of smart services can bring contextual and cultural dimensions in the delivered solutions. Especially, the knowledge elaborated in the domain of service design has focused the strength of collaborative services [2] as those collaborative solutions that may match the need for cities to balance the technical "smartness" of sensors, meters, and infrastructures with softer solutions based on public-citizens partnership.

The peculiarity of the HSC approach developed in the Periphèria research project is thus mainly rooted on the idea that a smart city is a place where citizens are the main actors of ICT-driven urban development. In such a place, new and innovative market opportunities for ICT and FI-based public services can be created and deeply rooted in the real problems of people, in their daily lives, in their commitment to respond proactively to their own problems and needs.

In line with the Periphèria vision, MyNeighbourhood is trying to further develop the HSC paradigm by amplifying and connecting existing grassroots social initiatives in 4 different European neighborhoods (in Lisbon, Milano, Aalborg and Birmingham) to show the potentials of connection and collaboration in designing, experimenting, assessing and upscaling smart services. In the following the design process adopted in Milano is described.

The Milano pilot experiment takes place in the Quarto Oggiaro neighbourhood, located in the north-west area of Milano, not far away from where the 2015 Expo will be located. Here the entire service design process has been conducted thanks to a strong collaboration between the Politecnico di Milano (holding a long tradition in design and in urban planning research) and the Municipality. This mixed design team performed all the activities in the contexts and managed the interactions with the local communities and stakeholders to engage them in the co-design process and in the service experimentation.

The first months have been dedicated to exploring and approaching the neighborhood: the design team started understanding physical aspects of the

neighborhood, the characteristics of its population, its socio-economic dimensions, the main actors operating in the context, the relation between the neighborhood and the rest of the city and the characteristics of the urban services already offered in the neighborhood.

After that a period of intensive co-design meetings started. In this phase the design team established 4 different design tables, involving designers, urban planners, people from the Municipality of Milano, representatives of the local associations and people from the neighbourhood. Each table started from a complex discussion on the main neighbourhood issues, ending with a list of main challenges:

- to regenerate disused and derelict public areas;
- to improve social life and inclusion of elderly people;
- to prevent school drop-outs and create job opportunities for young people;
- to explore and test new potential entrepreneurial opportunities and business models for start-up companies.

Starting from these challenges, the design tables then worked to elaborate possible service ideas as smart solutions for the framed problems. The service ideas developed for Quarto Oggiaro were: ICT and Bread, Quarto gardening, Quarto Food and Integrated Neighbourhood Communication.

Out of these service ideas, My Neighborhood focused on two of them: Quarto Food and Quarto Gardening. In the following, we will shortly introduce two of them.

### *The Quarto Food service*

Quarto Food Club addresses the relevant needs of the quite large community of elderly people living in Quarto Oggiaro.

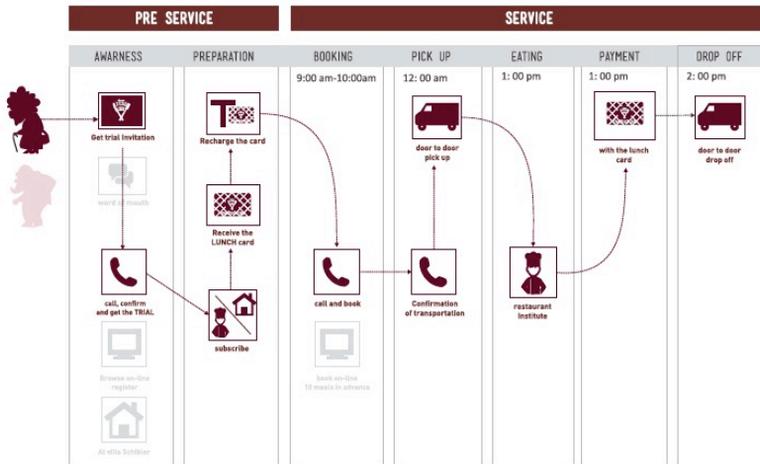
It is a service that combines the need to deliver food to vulnerable single elderly citizens with that of improving their social life, enjoying a meal prepared with special care and consumed in a sociable condition to relieve their sense of loneliness.

At the same time, the service aims at responding to the second neighbourhood issue of the young people unemployment, exploiting the involvement of the students from the local hoteling schools, who can receive credits for the practical training having the possibility to enter in a real food preparation and catering experience.

Specifically, the service involves two high schools in Quarto Oggiaro where students prepare every week some meals as part of their training for catering and food preparation.

Starting from this resource, the service idea is to deliver these meals to a group of elders living in the Neighborhood, preparing for the occasion a kind of social space in the schools, where elderly can enjoy the meal together, getting in touch with each other and with the students.

The students will also have benefits from this interaction, as they will receive academic credits while their work will become visible and recognized by real end-users (fig. 3).



**Fig. 3.** The Quarto Food customer Journey from the point of view of the elderly people

The implementation of the service required the development of a formal partnership: it will be thus really delivered thanks to the agreement between the professional hoteling schools (providing the food preparation and the venue) and some local associations (providing the contact with elderly people and a van for the transportation from the private places to the school and vice versa).

Through ordinary activities of food processing, students will prepare - from 1 to 3 days per week - meals for the target group. An IT platform will support the process of the booking of the meal and the trip, and a personal rechargeable lunch card will be provided to the users to partially cover the costs of the meal and the service.

### *The Quarto Gardening service*

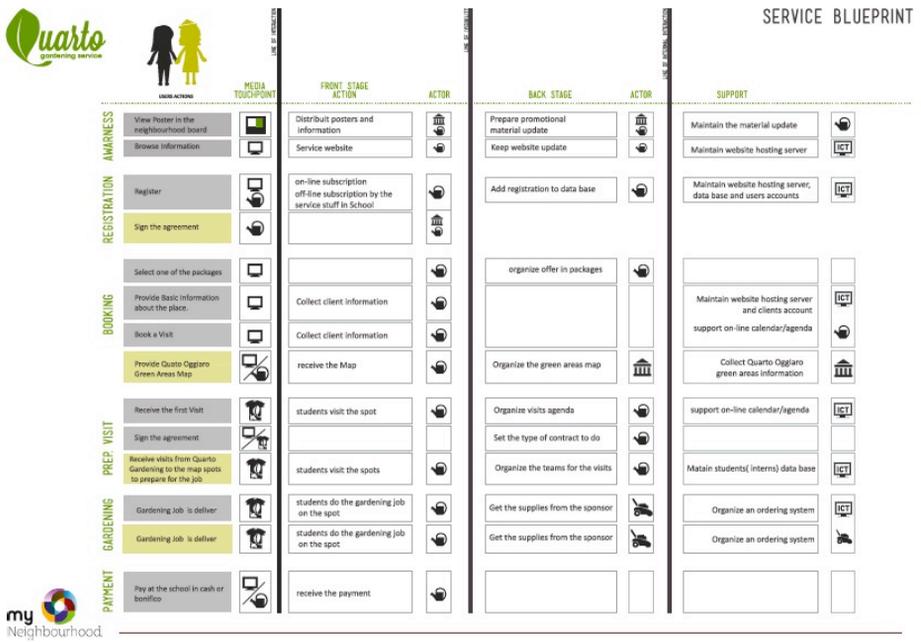
Quarto Gardening is based on the same structure of Quarto Food, and consists in a co-designed service that provides the possibility for the Municipality of exploiting the competences of the students of the Quarto Oggiaro agricultural school to take care of some the green areas in the neighborhood.

The service is made possible thanks to the agreement between the management of collective green areas (Municipality of Milano and the public institute for Social Housing in Milano) and the local agricultural high school.

Through practical training activities, where teaching credits are acknowledged, students will take care of some green spaces in the neighborhood.

A focal point for the experimentation of the service could be Piazza Capuana, the crucial place in Quarto Oggiaro, where the service is planned to start. This choice was made in order to make the impact of the service and the action of the MyNeighbourhood projec in the neighborhood highly visible (fig. 4).

The service goal is to contribute to reducing the expenditure for the maintenance of public green areas, regenerating public spaces and experimenting new opportunities for young people by testing a new business model. The beneficiaries would be both public like the municipality and private, for example the building managers, resident citizens.



**Fig. 4.** Quarto Gardening service blue print puts together all the partners involved to deliver the service: the school, the municipality, the students, the citizens, the manager of the buildings.

### 3 Lessons learnt from the projects

The co-design processes implemented in Periphèria and in MyNeighbourhood have been a good laboratories to experiment a few key-issues related to the co-design of public services and to the development of the co-design approach in complex communities. In the following the most important lessons learnt are reported:

- Transferring the new service design approach to the public sector can change the way in which municipalities design services. There are many ongoing experiments in Europe demonstrating that governmental programs are looking at service design

with interest. Here we would underline as My Neighborhood, on the basis of the results from Periphèria, is experimenting service design not just as a method to redesign the users' experience but also as set of competences that may trigger profound and unexpected changes in public organizations, if transferred and interiorized by the employees;

- Small experiments and initiatives are crucial for gluing citizens around “the same story”, making them active with respect to larger urban transformation;
- Volunteers and associations can be considered good entry points in the contexts where they are present, but the risk that they introduce resistances to change, due to the potentially negative impact of their established practices on new ideas, processes and solutions, must be taken into account;
- MyNeighbourhood combined the idea of turning people Wishes, Interests and Needs (WINS) in new collaborative services with larger strategic frames and goals. E.g. in Milano the design tables also worked as places where the Municipality could discuss its vision (the idea that urban transformation should govern and drive the flourishing of small initiatives synergizing them towards the larger change) together with the people from the neighbourhood;
- Periphèria demonstrated that services can be interpreted as tools for triggering the development of the intangible infrastructures of cities that may have reflections on the tangible dimensions. New partnerships, combining knowledge on service design and management, urban planning and ICT, are needed for re-thinking the smartness of cities;
- The current regulations and policies can be constraints for the design of the new services (MyNeighbourhood is suggesting new practices, facilitating bottom-up experimentations as means to inform policies and to dynamically review and assess the same regulations);
- Complex participatory processes can be applied to find short-term convergence among stakeholders that can go on perusing their larger objective but find convenient to be partners in some small experiment. E.g. in Milano the schools involved in Quarto Food and Quarto Gardening are not interested in developing new businesses, while MyNeighbourhood can give them the possibility to involve their students in real experiences. In Periphèria some small printer shop around the Politecnico di Milano Campus area found interesting to sponsor &CO, since it represented a communication channel towards students more than an alternative business;
- Collaborative services developed in MyNeighbourhood need to find an owner that will take charge of maintaining them after the end of the project. For this purpose MyNeighbourhood is developing strategies for the scaling up of solutions;
- &CO is now planning to become a GAS (Gruppo di Acquisto Solidale – Ethical Commerce Group): this will represent the recognition of a network which will not be formalized by an agreement but by the use of the service;
- TOC TOC is an already well-established service and its network appeared so relevant that an incubator asked the people managing TOC TOC to enter the incubation process to become a robust startup;
- Both services in the Periphèria research project were designed and developed with groups of students that at the end of the testing phase took the service ownership.

## 4 Conclusion

Cities are today facing disruptive challenges: great expectations are put in the Smart City paradigm, calling for smarter solutions and creating pressure on the public and private sectors to deliver innovative services.

Most of the established solutions keep technologies out of the urban environments: technologies are thus far from being considered components of the urban functioning, and even farer from people and their urban spaces.

In this framework design is orienting its theories and practices towards a different paradigm that puts people at the center of the cities' smartness and recognizes the need for developing micro and contextualized solutions to address larger urban issues in a sociable mode.

Opposite to the mainstream, the HSC [9] [29] [37] paradigm focuses on concepts like citizens' needs, bottom-up initiatives, people and communities-centred solutions, grassroots initiatives and social innovation.

The HSC paradigm is bound to the idea that smartness relies on the capability to boost, encourage, realize and scale up intangible urban infrastructures, based on new typologies of partnerships for the development of services, and on the organisational change of the public administration [3] [2] [11] [13].

Both the *Periphèria* and the *MyNeighbourhood* projects build on this vision, experimenting complex participatory design as the most suitable approach to create the conditions to set up and generate innovation ecosystems where networks of actors and stakeholders can co-develop solutions in partnership with their public administrations [4] [5] [15] [23] [26] [27] [41] [29].

In the tradition of co-design many researchers have focused on the potentiality of the collaboration with end-users, primarily looking at the interaction in the evaluation of the prototypes as a way to engage external stakeholders in the assessment of the new solutions [31] [33] [39].

Contrary to these approaches that emphasize the involvement of end-users in the phases of evaluation and adaptation, *Periphèria* and *MyNeighbourhood* propose a situated and human-centered approach to develop innovation in local communities.

Following this approach, both projects built on the particular conditions and resources of the local communities engaged in the pilot experiments, providing a platform for engagement that transcends the traditional co-design methods and tools.

The challenge for this new approach is to provide evidence of what can be accomplished beyond the traditional co-design, with a twofold aim: (i) addressing the real problems of the context; (ii) establishing a long-lasting strategy of innovation for that context. To achieve these objectives, the two above-described projects introduced a new way of conducting the co-design experiments by:

- modeling and releasing to the municipalities methodologies and tools to manage complex participatory processes that put together citizens, private and public stakeholders in unprecedented partnerships;
- pushing the need to focus on collaborative services (i.e. those services where citizens play a significant role in ideation, delivery and maintenance);
- supporting the scaling up of the envisioned solutions beyond prototyping and in vitro experimentation with final users.

In the urban living labs of the discussed examples, the Milano public administration is involved in different ways: in two cases it is asked to approve, support, or collaborate actively and its involvement varies from very light engagement (for example, in those cases where their role is limited to sponsor or promote the initiative –TOC TOC and &CO- or when they act as promoters) up to deeper responsibilities assumed with resource investment and some complex public decisions (in the case of QuartoFood Club or QuartoGardening).

Among these different engagement levels and forms of the public administration it is clear that the governance model has been aduated to the dynamics of the service collaboration network and also to the very specific needs of the service-codesign process: the governace model, which obviously is not generalizable, is being experimented throught the service development process without becoming a constraints for the process it self, rather fostering and “taking care of” the embedded innovation. This is clear in the first two examples where the municipality can be identified as a peripheral actor setting the stage of the innovation rather than directly interveening in the process.

Differently, at the micro-scale of the service co-design, the experimental dimension of the governance is being transformed into a learning opportunity for the municipality that is rething the governance of the green areas and park management also taking into accounts the innovative modes proposed by the QuartoGardening initiative.

The forms of governance that are emerging in the described environments are shaping an urban smartness far different from the one that is beeing widely targeted by urban administrators: the urban smartness is emerging in fact as an ability to experiment and learn inside complex sociotechnical networks in which the role of the public administrations is that one of checking continuously the coherence between micro-scale innovation and macro-scale visions, or even that one of validating macro-scale visions.

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