

Co-creating a Smart City strategic roadmap for small-sized cities: insights from a Swiss case study

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Abstract

Digital innovations are increasingly acknowledged as powerful enablers of the transition towards overall more sustainable urban contexts, under the framework of smart city interventions. If properly designed, in fact, they can help to build a more efficient and liveable urban environment. Different countries have therefore launched plans to promote the development of smart city strategies within their territory. While past experiences of smart city processes mostly focused on technological optimization of infrastructures and services, recent trends in the smart city domain call for increasingly participatory co-creation processes, capable of moving people and governance issues to the core of innovative city services. In large cities and metropolitan areas, such processes usually engage key stakeholders. In small cities, instead, city managers also have the opportunity to directly engage with the population. How can citizen and local actors be engaged in such smart city processes? Which are the opportunities and limitations associated with their direct involvement? In this paper, we tackle these questions by presenting and discussing the methodological framework adopted by the Swiss small city Mendrisio (about 15'000 inhabitants), that in 2019 launched a participatory process for the co-design of the “Mendrisio Smart City Strategic Roadmap”.

Keywords

Smart city, participatory process, small-sized cities, co-creation, roadmap, opportunities and barriers.

1. Introduction

Since the late 1990s, information and communication technologies (ICTs) are increasingly being exploited in urban areas, under the “smart city” conceptual framework [1, 2]. At first mostly aimed at increasing resource efficiency through the development of ICT and sensor network infrastructures, the concept of smart city has later on evolved, to embrace a more holistic perspective that encompasses urban socio-economic development as a whole. Nowadays in fact smart cities are called to adopt an inter-disciplinary perspective, dealing with smart environment, economy, people, living, mobility and governance aspects [3]. Such an approach was for instance effectively summarized in the smart city wheel tool [4]. This evolution has led to the definition of “smart city” as a sustainable and innovative city, that uses the opportunities offered by digital innovation to improve quality of life, efficiency of urban operation, services and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects [5].

With the aim of contributing to the achievement of such a virtuous urban configuration, different countries have therefore launched plans to promote the development of smart city strategies within their territory [6]. In Switzerland, this role is primary undertaken by the Swiss Federal Office of Energy, with the SwissEnergy for Municipalities Smart City program, which provides financial support to municipal projects in this area, at both the strategic and operational level [7]. Furthermore, in some cases Swiss municipalities can count on financial support from their own Canton, such as the one provided for innovative energy efficiency projects by Ticino [8]. In order to develop a strategic smart city roadmap,

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municipalities can anchor themselves to different strategic documents at national, regional and local level.

Against this backdrop (Figure 1), in 2019 the Swiss City of Mendrisio (Italian-speaking part of Switzerland, 15'484 inhabitants in 2018) decided to make the first steps towards becoming a smart city, by developing a Smart City Strategic Roadmap [9].

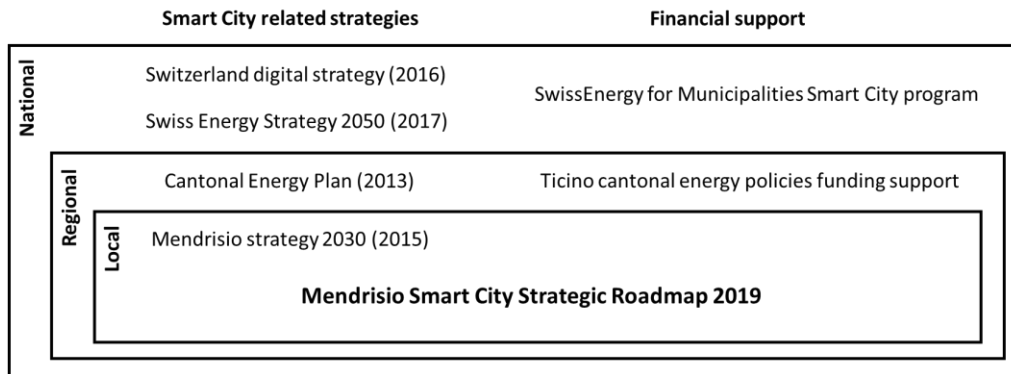


Figure 1: The strategic framework and public funds supporting the definition of the Smart City Strategic Roadmap of Mendrisio.

To define a Smart City strategic roadmap, two main approaches can be identified. The first one is an expert driven approach, where citizens have a passive role and cities mostly focus on technological optimization of infrastructures and services. The second one is a participatory approach, where people, governance and policy elements are put to the core of urban decision-making processes, and citizens are actively engaged in the co-creation of innovative city services [10] [11][12]. In the case of the Strategic roadmap of Mendrisio, a combination of these approaches was adopted, with the aim of making the process of development of the strategic roadmap as coherent as possible with the recent understanding of the “smart city” concept. In this paper, we present how the process of developing the Roadmap was organized in order to enhance the role and scope for citizen participation, and discuss its outcomes.

2. Methodology

The process lasted for about one year and it was organized in three stages. Typical expert driven activities (first identification of opportunities offered by the digitalization and definition of the measures and priorities of the strategic roadmap) were anticipated by a set of participatory, citizen-driven activities, targeting both local stakeholders and the broader population (Figure 2). This process allowed to identify priorities and specific needs by the local actors . Then, such priorities were analysed compared to available opportunities offered by digitalization, by involving both local political decision-makers and a number of private and public actors active in this field. The elements thus collected allowed the City of Mendrisio to draft the “Mendrisio Smart City Strategic Roadmap” [9].

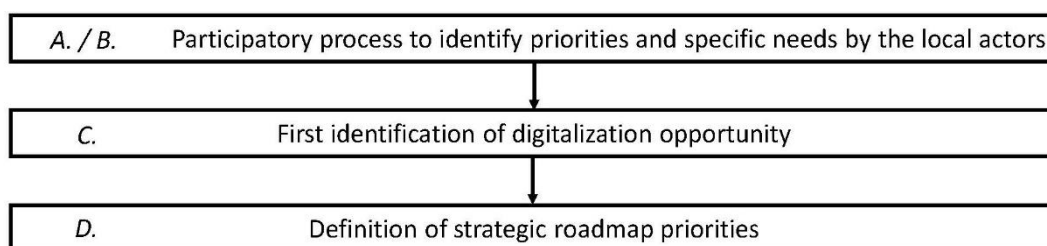


Figure 2: The three-stage process for the definition of the Smart City Strategic Roadmap of Mendrisio.

Inspired by processes implemented in sustainable urban planning [12], the participatory process was organized in two parallel channels: the first one targeted public actors and institutional representatives of the municipal administration (technical office, school, art museum, police, firefighters, and energy company), the second one targeted the general public (Fig. 3). In order to activate a debate, in both cases the process was organized around the general question “How would you like the Mendrisio of the future to be?”, with the aim of collecting ideas and proposals on how to make Mendrisio a smarter, more efficient and sustainable city [6]. The question was on purpose kept very open and did not directly refer to the concept of “smart city”: this allowed the local stakeholders’ and population’s desires and needs to emerge without caging them in the technological discourse in a acquiescent way [13]. How to meet such desires and needs also through the opportunities of digital innovation was left to the experts in the following stage.

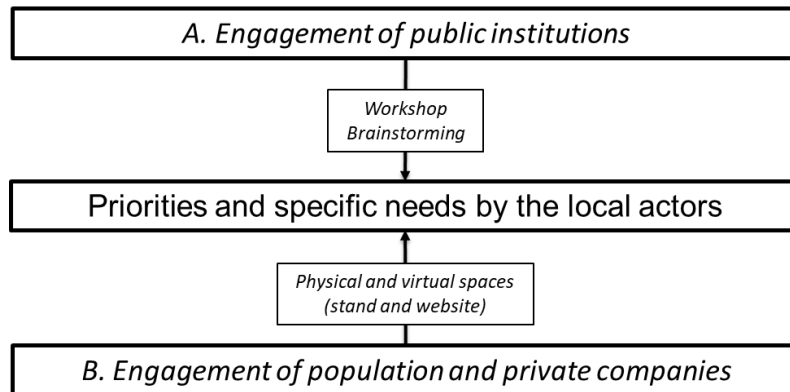


Figure 3: The two parallel channels of the participatory process developed to identify priorities and specific needs by the local actors.

2.1. Engagement of public institution (A)

Representatives of municipal institutions were invited to join an interactive half-day workshop (February, 18 2019). Discussion was organized in six thematic tables, one for each of the topics of the above-mentioned “smart city wheel” (Figure 4). Participants were invited to join discussions in two of their favorite tables, and to address the general question from the point of view of each topic. A final voting round allowed to identify the key elements that the majority of institutions considered to be crucial for the future of the City, as well as those to be avoided, thus leading to the identification of a shared vision for the future of Mendrisio.

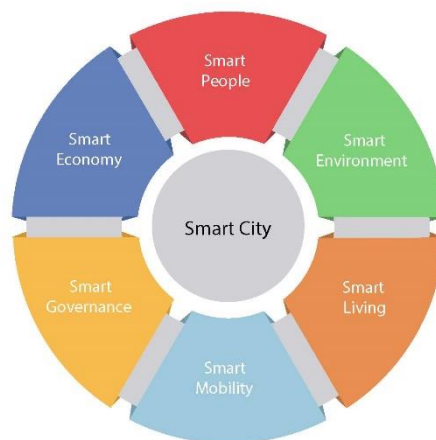


Figure 4: The smart city wheel tool (SUPSI grafic) [3] [4].

2.2. Engagement of population and private companies (B)

Participation by the general public was based on a website inviting any citizens or companies operating in the municipality to submit their ideas about how they would like the Mendrisio of the future, through an online form. The form, which did not require any registration and was available from the official City website, allowed submission of open texts and only required information on the place of residence (neighbourhood), gender and age range of the respondent, for statistical purposes. All submitted ideas were shown on the website, provided that they did not include insulting contents.

The website was launched by means of a communication campaign targeting the whole population, including private companies, which exploited both traditional (local press and radio) and social (Facebook) media. To increase the number of respondents, the campaign was accompanied by in-person events targeting specific segments of the public (a workshop with high school students and participation to a general meeting with representatives of all sports and culture associations). Email communications have also been sent to all the economic activities settled in town, and flyering was performed at the weekly market and at a local fashion event. Finally, a physical stand equipped with tablet as well as cards for submission of paper ideas, was made available at the highly popular local cultural centre, thus providing the process with further visibility and reducing the risk of social exclusion due to the choice of mostly running a digital participatory campaign. One month after its launch, the website was “frozen” and possibilities for idea submission were closed. The submitted ideas were then analyzed and categorised based on their content, with respect to the six components of the smart city wheel.

2.3. First identification of digitalization opportunities (C)

To evaluate the results of the participatory process and start to identify the opportunities offered by digitization, a working group met on three occasions during September 2019. This group was composed of a political representation (mayor, municipal secretary), an administrative representation (environment office, economic development office, data processing centre) and the Mendrisio grid distribution system operators (*Aziende Industriali di Mendrisio – AIM*). These meetings were also joined by additional experts, who were invited to provide additional contributions on the issues under discussion: the coordinator of the SwissEnergy for Municipalities Smart City program to discuss the process, representatives of Switzerland's leading telecommunications company (*Swisscom*), and representatives of private companies active in digital innovation based in Mendrisio (*Dos Group and TiGIS*).

2.4. Definition of strategic roadmap priorities (D)

In November 2019, thanks to the results of the previous stages, the working group met to define the first measures and priorities of the Strategic roadmap of Mendrisio. The municipality, through a process of political validation, has subsequently published its first “Mendrisio Smart City Strategic Roadmap” [9].

3. Results and discussion

Overall, all the invited institutions attended the workshop for the engagement of public institutions, for a total of 15 people, allowing for both a political and an administrative representation (responsible officers for environment, urban planning, economic development, data processing, social policy, administration, communication, grid distribution system operator, school, art museum, police, fire department). The concepts that emerged and were most voted by the representatives of institutions were accountability, involvement and flexibility (Table I).

Table 1

Concepts highlighted by the public administration

Key word	Number of preferences
Accountability	5
Involvement	4
Flexibility	4
Behavior	3
Slow mobility	3
Welcoming City	3
Shared values	2
Sense of belonging	2
Proximity	2
Teleworking	2
Enterprising city	2
Sociality	2
Environment and territory	2
Volunteering	1
Good examples	1
Sharing	1

The vision resulting from the public institution workshop describes in fact a city that “pays attention to the environment and the resources of the territory, where citizens share values and a sense of belonging to their community, and are involved and empowered in promoting quality of life”. While ideas regarding the economic sector were marginally proposed by the population and private companies, the vision emerging from institutions also stressed the need for the city to be “open to innovation and capable to flexibly respond to the needs of the population, without uncritically replicating development paths conditioned by the - sometimes ruthless - rules of international finance”.

Table 2

Ideas by population and private companies

Topic	Thematic area	Number of ideas	Total number of ideas
Environment	Urban regeneration	29	58
	Waste	15	
	Animals in the city	5	
	Water - Air - Noise	5	
	Waste	4	
Mobility	Local public transport	29	55
	Cycle-pedestrian mobility	15	
	Shared mobility	5	
	Traffic regulation	5	
	Electric mobility	4	
	Air transport	1	
Quality of life	Sport activities	29	27
	Fun, culture and entertainment	15	
	Activities for families and young	5	
	Public and individual health	5	
Economy	Entrepreneurship and innovation	9	9
Administration	Government and participation	5	5
Society	Solidarity	4	5
	Training	1	

Participation by the population and the private economy resulted instead in 115 forms, for an overall number of 159 ideas (Table II). Focus of the majority of ideas by both the institutions and the population was on topics related to the Environment and Mobility.

The results of the participatory process seems to show that the theme of digital technology does not appear central to the desires and needs by citizens and private companies and to the vision by public institutions. The most cited aspects by the institutions are in fact related to city responsibility, shared values and a sense of belonging to the community. Also, the population cares about urban regeneration and the development of more sustainable alternatives to the dominant fossil-fuelled car-based mobility.

For this reason, during the meeting with the experts, and in the reasoning towards the definition of a strategic roadmap, it was decided to divide the approach into two levels of development. The first: symbolic, emotional, and communicative. Necessary to structure a sense of community that allows the population to identify, participate in the process proposing and developing actions from below, not necessarily related to technological concepts. The second level, also in support of the first, is instead operational. Technological innovation design themes have been defined, describing what the municipality intends to do, the related expected impacts, and the time track.

4. Results and discussion

According to the current dominant theory of the evolutionary perspective [14], the development of any urban environment, although limited in size, is characterized by a complex system of bottom-up processes, with dynamics that are difficult to predict and plan for. A collaborative, participatory approach, involving productive interactions between the different networks of urban actors, is one of the options for integrating this complexity into the structuring process of a smart city strategy [15]. Moreover, the integration of the opportunities of digitization can help optimizing urban ecosystems and planning processes [16]. As seen in the introductory Section, the Swiss context provides a strategic and financial framework that favors the development of these projects.

Through the three-stage process described in this paper, the City of Mendrisio has been able to take advantage of this opportunity by defining a strategic path that seeks to take into account the priorities and specific needs coming by the citizens and local actors. The choice to use an open question about the future development of the city allowed the identification of general aspirations, desires and needs. An interesting result of this approach was the fact that the theme of digital technology does not appear central to the desires and needs by citizens and institutions. In any case, the conceptual framework of the smart city wheel has made it possible to translate these desires into specific thematic areas, helping experts to develop the operational planning process and the political-administrative apparatus to make strategic choices [3] [4].

In conclusion, the experience of the city of Mendrisio confirms the reasons why the direct involvement of citizens and local actors in the definition of a smart city strategic path is considered essential by the evolution of this concept and in relation to the latest definitions that highlight the complexity of urban development [10] [11][12][14][15][16].

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