THE URBAN AND ENVIRONMENTAL PLANNING OF *SMART CITIES*: INNOVATION AS A SOCIAL, ECONOMIC AND SUSTAINABLE DEVELOPMENT OF AN URBAN CENTRE

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Abstract

The goal of transforming an urban centre into a smart city leverages on the integration of technological and social components but, above all, on an urban development model born from a vision that aspires at creating smarter, more sustainable and inclusive cities, not only with the introduction of technology, but by generating innovation as well. In order to achieve this, the smart city must adopt an urban life cycle planning and management model capable of constantly allowing the ICT components to interact with those of governance, modelling itself on the locational decisions of major urban functions.

In this article, we essentially want to highlight how, for an urban centre, smart cities represent a successful business model with significant economic potential and, additionally, the development strategies necessary to enable cities to become smart.

Key words: *smart city, strategy, development process, strategic urban planning*

1. INTRODUCTION

The crisis situation of today's urban contexts was generated by the implementation of unsustainable development and growth models, created during the industrial era and linked to an economy of consumption that, for quite some time now, has shown strong signs of breakdown (Rifkin, 2002). The issues that define this situation, as reported by the European Commission, mainly concern the high levels of unemployment, the growing number of individuals at risk of poverty, the high level of school dropouts, the lack of investment in research and development, which limits the potential for innovation (European Commission, 2010) and the environmental situation, for which cities are highly responsible, as they produce 70% of the carbon dioxide present in the earth's atmosphere and consume about 75% of the global energy (American Association for the Advancement of Science, 2001; Ratti, 2010; UN-Habitat, 2011).

With this in mind, experts began to assess whether and how digital technologies could become a tool with which to improve the situation of urban contexts. Many public administrations have already planned to implement specific urban and territorial management strategies that, by integrating information and communication technologies, could constitute a sustainable development tool.

In 2010, when the transformation of the urban centres began, only 40 cities around the world declared themselves committed to this type of smart planning (Singh, 2010), whereas, in 2012, the number of cities that included these types of strategies in their administrative plan went up to 143 (Lee and Hancock, 2012). That number has been steadily growing with the years.

In addition to representing a possible solution to the crisis situation in urban centres, *smart cities* are an effective business model and a significant economic potential precisely because, starting from the original ICT infrastructure blueprint, a *smart city* must also include coordinated and integrated interventions on a social, environmental and economic level, aimed at enhancing human capital, reducing environmental impacts and the resolution of the environmental emergencies that are considered priority (e.g. land use, urban and energy redevelopment, mobility and waste management), with the correlated economic benefits (Federico, 2013) and the immediate to long-term positive effects for the citizens.

2. URBAN PLANNING FOR SMART CITIES

Numerous public administrations have launched specific strategies in the attempt to transform ordinary cities into *smart cities*, centres in which ICT's are used effectively as a tool to support their development and the regeneration of their infrastructure. Whatever the way to conceive the transformation to be implemented, with regard to the *"smart city"* concept, and whichever way one interprets this definition (Chourabi et al. (2012), Nam and Pardo (2011a; 2011b), and Reviglio et al.), the one thing certain, in all the cases, is the central role played by ICT's in building the city of the future. (Batty et al., 2012).

Despite the fact that more and more cities are taking steps in this direction, the level of knowledge regarding this particular subject is still very limited and there are still several aspects that need to be explored. In particular, what weighs the most is the lack of guidelines that could be used as a reference for the creation and management of a strategic planning scheme (Angelidou, 2014; Chourabi et al., 2012; Frei et al., 2012; GSMA et al., 2011; Hollands, 2008; Komninos, 2011; 2014; Manville et al., 2014).

The *smart city* concept was born in Europe, which, over the past decade, has embarked on an ambitious path for sustainable development and the fight against climate change. This path foresees an increasing number of development goals required by law; The EU 2020 Strategy is a scheme to combat climate change and it is necessary for cities to develop on the basis of these assumptions.

European cities are the bearers of visions and advanced programmes, and are facing common ground in the fight against climate change, in favour of a better quality of life.

With regard to the strategies used by major European cities, particularly Amsterdam and Barcelona (Bolici and Mora, 2015), one can outline a possible approach for the development of *smart city* strategies in European cities of large dimensions. Large European cities are used as a reference, as they represent a type of urban area that is extremely active and involved in the development of such strategies, as well as the quality of the approach used.

In order to identify the fundamental steps to be considered for proper planning in large European cities, it is important to focus only on the successful cases, on the strategies that actually enabled them to use ICT's to support their development and resolve their problems. The cities of Amsterdam and Barcelona have gained numerous international recognitions in the field of *smart cities*, testifying to their success (Achaerandio et al., 2011; European Commission, 2014; Cohen, 2012a; 2012b; 2014; Jander, 2013; I amsterdam, 2011; Manville et al., 2014).

3. PHASES OF URBAN PLANNING

The documentation gathered regarding the transformation of the cities of Amsterdam and Barcelona, allows us to trace the essential steps that make up the process of urban renewal.

The launch of a *smart city* strategy starts with identifying and choosing sponsors who embrace the idea of using ITC's to support urban development. These could be public or private entities that have expressed the same resolve to transform the city and, working alongside the municipal administrations, can offer valuable help by providing knowledge, human and economic resources, as well as collaboration and commitment in achieving the established targets (Anderson et al., 2012).

Once the problems and potentials of the urban centre are identified, these entities will have the task of motivating and promoting anything that can be developed properly with the use of informatic technologies.

Because each city is different, the motivation will be contingent on the nature of its problems and strategic priorities, which could be social, economic and/or environmental (Berthon and Guittat, 2011; Zygiaris, 2012).

At a later stage, the sponsors will place the department of one of the organisations involved in charge of the proceedings which, in turn, must form a team that will have the task of planning the strategy. The team members must possess multiple skills, particularly in the sectors of urban planning and design, as well as in ICT's and *smart city* strategy development. If these skills were to be absent, it would be

necessary to attain the support of strategic partners as external consultants. Next comes the planning phase, with the implementation of the projects to be developed in the medium to short term, which will provide the city with new services, devices and infrastructures that are part of the ICT sector.

The proper execution of all the projects is monitored by a dedicated team that will take care of the implementation phase (Manville et al., 2014) and their work will be supervised by the department responsible for developing the strategy.

Lastly, during the planning phase, it will be necessary to establish a methodology in order to monitor the progress and the evaluation of the results achieved with the individual projects and, starting from these, the evaluation of the further design ideas to be developed.

The next step is project implementation, during which everything outlined in the planning phase is put into action by mobilising the implementation team, which will also stimulate the proposal of new project ideas, while organising the design of the concepts already selected based on priority of intervention and financial availability. The financial strategy often applied in such cases is mainly based on the combination of public and private resources (Schaffers et al., 2012; Singh et al., 2009), which includes an intense activity of communication aimed at encouraging the creation of new partnerships and the acquisition of new resources.

Each activity is constantly monitored, evaluated and subjected to a continuous review and editing process, aimed at ensuring the consistent improvement of the strategy and its adaptation to an ever-changing context.

Another important aspect is the visibility and recognisability of each urban centre involved in this project. It is, therefore, essential that the individual stages and results achieved are circulated in a capillary manner, with informative documents through the dedicated digital platforms, and that there is an exchange and collaboration with all the other centres that adhere to, and engage in, this form of change, which represents a social, sustainable and economic development.

4. RESULTS AND CONCLUSIONS

Strategic planning is an iterative and systemic process that supports the decisions with which a community works towards the creation of a desired living environment (Albrechts, 2005, Fera, 2005), and allows complex urban and territorial transformations to be managed in a context characterised by continuous and rapid changes (Blecic et al., 2011).

It is, therefore, advisable to fully document all the procedures used, so as to evaluate and review them through further comparative research. Likewise, cataloguing everything on digital databases is an indispensable way to make the experimental information regarding a project, the guidelines of which are constantly being refined, readily available and usable, because if on the one hand it is true that the data of reference must be tailored to the specific case and that every centre is a unique case, it is equally true that every area of success can be an inspiration and provide knowledge from which to learn.

The integration of ICT's in urban contexts is far more than a technological matter (Aurigi, 2005, 2006; Graham and Marvin, 1999; Graham, 2000) and the cities willing to work for a *smart city* future must adopt an approach that goes beyond technology, also focusing on other factors of a different nature but of equal importance. Human factors that are less discussed in scientific literature, such as political support, collaboration between organisations from different sectors and citizens, long-term vision and specific objectives, communication and promotion, governance model, availability of financial resources and the ability to select the right combination of projects to be developed in the medium to short term.

In the Italian context there are some examples that are worth mentioning, such as the construction of strategic plans for the vast Novarese area (Gambaro, 2010; Mussinelli, 2008) and for the municipalities of Marsala and Mazara del Vallo (Mussinelli and Tartaglia, 2012; Et al., 2012); the activities that made it possible to define the design proposals needed to support the development of the DOMInUS Cultural District (Oltrepò Mantovano for Innovation, Unicity and Development) and Le Regge dei Gonzaga

Cultural District, both financed by the Cariplo Foundation (Fanzini and Nicolis, 2012; Fanzini et al., 2014); the elaboration of territorial marketing plans for both the Morenica Mantovana Area (Schiaffonati, 2005) and for the Oltrepò Mantovano Area (Casoni et al., 2008); and, finally, the research associated with the strategic management of the process of development of the eco-museum (Riva, 2008).

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