

# **Contemporary Approaches in Social Science Researches**

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# Smart city. A sociological perspective of urban vision

Melissa Sessa

## 1. Introduction

The theme of the *smart city* polarizes the interest of many disciplinary and research fields, also thanks to the numerous economic resources allocated for those projects, due to worrying increase of the urban population that has brought with it scarcity of energy resources, high social conflict, crisis of political representativeness and ethical drift (Fistola, 2011, p.74). The city is an intelligent and chameleonic system, able to adapt to all kinds of changes, from economic to political, to social ones. It is a “physical structure placed in a space” (Mazzeo, 2016, p.66), but does not end with this proposing multidimensional and multidisciplinary characters such as those of culture, ecology, technology, society (Castells, 1989). It is a system that is expressed in all its parts that operate as close and interconnected entities. In recent years, the city has acquired ever greater centrality in the process of economic, environmental and social development (Agenzia per l'Italia digitale, 2012), becoming a focal point for national and international policies and economic strategies, especially for four orders different factors. The first of these is connected to the growing lack of resources, either energy or environmental, which have led to the rediscovery, in both economic and environmental terms, of sustainability, seen as a solution to the deficits created by the excessive use that modernity makes of his capitals. The second point is found in the sustained growth of the world population that has gone hand in hand with the increase in levels of urbanization. The third concerns the increase in consumption by the cities, which have been responsible for an excessive waste of energy and around 80% of CO2 emissions worldwide. And finally, the phenomenon of globalization (Rifkin, 2011) that exposed urban realities to dichotomous consequences: on the one hand, cities that are continuously growing, with the subsequent problems ranging from overcrowding to inadequate transport systems; on the other hand, cities that tend towards the decline that leads to the degradation of infrastructures and scarce economic availability (De Santis, Fasano, Mignolli & Villa, 2013).

Thus, the coexistence of countless problems related to scarcity of resources, sustained growth, increased consumption and globalization, makes the city the ideal stage for the experimentation of digital technologies. Although, however, the talk about smart cities tends to take for granted the consensus that revolves around its devices, it must however be considered that the social reality in which these smart cities immerse prefigures more than one difficulty. Difficulties of putting into practice because the cities, in their urban landscape, are not lacking in deeply rooted and internalized cultural structures, and that therefore sometimes resist the penetration of smart paradigms. As the world population is growing and it is expected that this growth will also and above involve all the city, technology can play an important role in limiting consumption and improving the quality of life. The indissoluble objective, considering today's economic crisis, remains the relaunch of the economic competitiveness of the system through the creation of synergies between the development of new technologies and the growing protection of the environment. It is within this situation that the vagueness of meaning inevitably imbued with the definition of smart city “allows this concept to be used with a certain frequency and flexibility” (Ferrero, 2015, p.1269). The smart city, undoubtedly, constitutes a “phenomenon of social change taking place” (Marciano, 2015, p.15) and as such it must be sociologically investigated, turning its attention to the infrastructures and devices that qualify the smart city as a city unique in history, both the world of the real subjects inhabiting this city, and the ideal ones that are supposed to live in it. For this reason, the smart city can be analyzed, as Claudio Marciano does, by taking up Lefebvre's theory of social space (1975) starting from a spatial triad formed by conceived space, perceived space and lived space (Marciano, 2015). The smart city finds its space conceived in the ideas that see it as a dominant paradigm in the last years, in the researches and the rankings specifically created to measure the level. It meets the perceived space in urbanization that has

slowly developed into the city's territory. And finally, it is the lived space that becomes routine, when the technological matrix becomes space in everyday life, but does not take the upper hand over the present culture. No doubt the smart city was born and continues to survive thanks to the interests of the dominant interests, to say: the smart city survives thanks to the urban elites that perpetrate the cause of convergence between the devices in circulation and the ecological need which is ever more present. Despite the sharpness of the boundaries traced by the benefactors of the creation of this smart city, the difficulty that is found in framing such a large phenomenon is also found in the confusion that characterizes its definition, making it nowadays a magmatic concept depending on the meaning attributed to the adjective "smart". This adjective has always represented the will to indicate an evolutionary state (Fistola, 2013), due to the most recent developments in technological innovation. What clearly emerges is that "smart is more than digital" and that this phenomenon includes a plurality of factors and actors that have taken different trajectories (De Santis, Fasano, Mignolli & Villa, 2014). "A theoretical model capable of interpreting the smart city is still far from being defined" (Marciano, 2015, p.26) as Marciano had stated in 2015. And to this day it is still an extremely timely reminder because three years after that statement, nothing has changed. This is because the reason for this lack of a univocal definition over the years is due to the extreme heterogeneity of the applications in which the smart city takes shape, and which make it difficult to trace the net margins when it comes to its theoretical definition. Heterogeneity and extemporaneousness of practices have discouraged a theoretical approach aimed at framing the smart city as a model and that instead are often resolved into lists of characteristics that create everything but a universally usable model.

## 2. A magmatic concept

The first thing we must do is a distinction between "*smart*" and "*intelligent*" (Fistola, 2013). Both expressions are very widespread and have been used in the field of innovation to indicate the possibility, through the structuring of cognitive processes, of solving problems. A distinction seems, however, possible. If the term intelligent indicates the resolution of problems by methods and information learned, the term smart puts the emphasis on operability, also indicating which tools to use to solve complications. "While the intelligent thinks, elaborates and proposes which models to adopt to reach the solution, the smart also indicates how to proceed operationally and which devices to use" (Fistola, 2013, p.49). So, we can say that while the intelligent thinks, develops and proposes, the smart, thinks, elaborates, proposes and finally acts. One can see that the greatest consequence of the need to build urban systems with high sustainability and increasing resilience (Mazzeo, 2016) has is the spreading a particular meaning of the word intelligent, connoting it with a certain materiality, and thus making it evolve into smart. This materiality comes to be represented by a universe of sensors and actuators capable of managing and optimizing the activities in which the social actor is committed, but on the other hand also capable of providing continuous monitoring and control over citizens and their freedom of action.

Thus, we can consider the smart city as a new way of thinking and managing the city (Cocchia, 2014). Its diffusion is framed within the construction of the industrialized world, where it was perceived as a solution to the serious problems caused by urbanization (Komninos, Ratti & Schaffers, 2012), and therefore included in a concept of urban policy (Dameri & Rosenthal-Sabroux, 2014). The sudden growth of urbanization has generated problems related to the overcrowding of urban poles by people and infrastructures, which have inevitably caused a surge in consumption and pollution levels. It is indeed a concept of urban politics, but it cannot be separated from the territorial, geographical, and even more from the cultural context. It is no coincidence that alongside the ideal type of smart city, others can be found, more specific, as well as in practice, which adopt various facets of smartness that meet the required needs. As an alternative to the term "smart city", "Digital City, Wired City, Intelligent City, Knowledge City, Virtual City, Computable City" are also used. "Thanks to the advent of the digital world, the growing urban phenomenon has begun to conquer different forms, and in the same way also to be connoted with different names depending on the point of view from which it was analyzed. So, the city took the name of virtual city when it stimulated the growth of virtual laboratories to create the urban environment. It was called the computable city when it shifted its attention on how computers

and information technology had transformed the city. The intelligent city, on the other hand, was the set of urban planning strategies intended for the purpose of implementing public services. The wired city places the emphasis on connection and interconnection through technological systems, and finally the knowledge city that makes the “*cogito ergo sum*” an evolutive mantra (Van Veen, Distler, Braun & Bulthoff, 1998; Komninos, 2009; Batty, 1997).

This lack of lexical clarity, and therefore of the concept itself, has meant that some cities were “smart” when they recognized within them characteristics that corresponded to one of the canons of the confused smart city. Robert Hollands (2008), professor of sociology at New Castel University analyzes the different technological nuances with which cities are labeled as smart, finding that despite the smart terminology has taken many meanings from the beginning, the key element is still found in ICT (Information and Communication Technologies), which seems to be a necessary but not sufficient condition to define the smart city. Hollands’ perspective aims at broadening the concept of information from technologies to social relations by considering that the phenomenon of the informational city favors the conditions for the creation of the intelligent city “insofar as the latter has not only applied but internalized the informational paradigm within their functional sub-systems” (Marciano, 2015, p.67). In so doing, he divides the cities into four different groups, four peculiar dimensions, taking up the model of an informational city (Komninos, 2002, 2011):

- Cities that are more loyal to the idea of developing urban technology to become competitive in the global economy.
- Cities that put greater emphasis on business, and therefore on urban development in that direction, highlighting the role of local administrations in creating an environment conducive to business development.
- Cities that are more oriented towards social learning and inclusion, particularly focusing on the creative industry.
- Cities that put environmental and social sustainability first.

Hollands, however, polemically, warns us about the weakness of the definitive picture on the smart city, believing that it is not just an exclusively terminological issue. According to the author, the vagueness that cloaks the concept of smart city could be an intentional choice. It would have intentionally kept a veil of nebulosity and abstractness around the meaning of smartness, an artificial generality that was functional to include any aspect of urban development. The difficulty seems therefore to be the lack of a global vision that does not fall into the description of the parties outside the social context. We are often faced with definitions that fall into the technical field (smart building, smart district, smart street, smart infrastructure), thus forgetting the need for a look from the bridge that traces an overview.

### 3. Definitions to be compared

Since, as we have mentioned a holistic definition accepted at the universal level does not emerge (Nam & Pardo, 2011), many succeeded, instead, in the scientific field. The most accredited one is attributed to Rudolf Giffinger (Giffinger, Fertner, Kramar & Meijers, 2007), expert in the field of analytical research of urban and regional development, and worthy being awarded with the merit of having given us a definition of smart city that pivots on integration of various social subsystems. Such definition identifies six axes in which “the smart city impacts significantly on the creation of socio-economic value” (Cocchia, 2014, p.4). A city defines itself as smart when it generates sustainable performance over time in six areas: economy, governance, people, living, mobility and the environment. In other words, a city is smart if its economy, its governance, people, mobility and quality of life are in turn smart.

The key idea is that in today’s digital society, cities and their functions are not only characterized by physical infrastructures and legacies of past generations, but also by something less material, less tangible, such as the quality of communication, of social infrastructures, to say urban areas are also made up of social and intellectual capital. So, if it is possible to affirm that the structures that make up the city are the result of the interaction of those who lived and still live in it, it is equally true that the

infrastructures themselves are roads, buildings or technological networks, they were built to facilitate the improvement of the city itself and their presence provides, in turn, the direction and the urban development (Murgante & Borruso, 2013). Analyzing more deeply this definition we can see (Cocchia, 2014) how the smart city in this case, is strictly connected to the value of human capital, rather than other more purely economic components. The merit of Giffinger's work is to offer every indicator he creates for the definition of the city, seventy-four for thirty-one factors, an "inter-measurable value" (Marciano, 2015, p.38), in such a way as to give the possibility to the dimensions to be compared to each other. The author, however, notes how the model he created is a narrow model, where narrow describes a model that cannot be a paradigm for the totality of available cities, but that can receive reliable answers only from large cities.

Although Giffinger had placed the emphasis on human capital, traceable in the search for the quality of citizens' life, other scholars have considered that speaking only of human capital in those terms was not enough, but it was necessary to link it to other phenomena.

The human factor is certainly a beacon also in other definitions, such as the one by Caragliu, Bo and Nijkamp (2009), through which, at the same time as the human factor emerges, emphasis is placed on the use of infrastructures related to active participation. of the city structure. The authors start from a statistical analysis of the number of people who in the years of their research (2012) lived in cities, and that were about 50.6%, estimating that in 2050 they would have been over 69.6%, and they note how the simple analysis of this data is significant as far as urban quality, economic impact and social action are concerned (Caragliu & del Bo, 2012). Thus, we can state that this definition relates to the correlations between technological factors and social factors. The city described by the authors aims therefore at economic growth to promote the quality of life, through a governance that favors bottom-up action. The operating procedures that accompany cities towards the goal of smart transformation start from below, i. e. from existing resources, places, characters and vocations. And this means that they start from what is at the base, i. e. the citizens, who are the double-edged weapon of these phenomena, having the possibility to accept them and therefore to promote them, as to despise them and make them die (Bonomi & Masiero, 2014, p 109).

A further definition, which touches another of the facets of the smart city, is provided by the SETIS-EU, the Strategic Energy Technologies Information System of the European Union that traces in environmental sustainability an aspect not present in the other definitions because it is labeled as marginal, and which has become the main instrument for combating pollution carried out in recent years. The EU's tendency to decline the issues of smartness especially in terms of energy and the environment is also confirmed by the fact that the main containers for the development of these routes are the strategic plan for energy technologies and the Technology Road Map, which explicitly refer to smart cities, allocating very high budgets for their implementation. In the European context, the territorial characteristics, as well as the spatial objectives, occupy the center of development policies (Barca, 2009) to guarantee, in the same way, widespread growth aimed at an overall social cohesion. This attention to space and territory is linked to the already widely documented disparity in results and endowments that characterize the countries and cities of the European Union. The European Union identifies the smart city not as a phenomenon, but as a solution to offer its citizens and that promotes a better life by reducing the environmental impact from Co2.

Therefore, summing up these three definitions, one can see that there are some basic common characteristics (Cocchia, 2014, p.6):

- ICT and human capital as distinctive elements of the smart city
- The importance of the territory that marks the physical boundaries of the smart city
- The social character of the smart city, which aims at improving its citizens' quality of life through participatory governance.
- Sustainability developed in economic and environmental terms. The economic sustainability that aims at the scrupulous management of the city's resources through a continuous monitoring of its infrastructures and the maximization of services for its citizens. And environmental sustainability that experiments different technologies to achieve goals such as reducing environmental impact.

At this point we can go further, occupying a perspective that provides a broader look and that shows how all definitions share two basic components: a physical component that is to be represented by the infrastructure, and a social component, which instead finds its essence in the users of the city.

Then, aimed at understanding then, the processes of implementation of the smart city, we must consider the paradigm of sustainability in economic terms, or the conscious management of human resources, and therefore the new role of the consumer citizen, invited to be aware of their waste, presence of ICT as to the improvement of the social character with participatory governance. All features that work in synergy to ensure efficiency and urban quality. "What undoubtedly marks the smart city compared to the previous "city models" is the use of new information technologies in the transition to a more sustainable model supported by an urban community willing to revise, to change them, their lifestyles" (Pope, Gargiulo & Battarra, 2016, p.18). The city becomes "senseable" (Fistola, 2013, p 57), that is, capable of perceiving and therefore able to provide data on its components at any time. Precisely this continuous self - monitoring allows to intervene promptly to limit the entropies and direct the transformation towards alternative scenarios. In this scenario, we make room for what are called feedback technologies: in many cases changes in behaviors are so slow and gradual that they are imperceptible to the human eye, so there is a need for technologies that help to understand these differences.

Moving away from the theoretical system of this phenomenon, we realize how (Cocchia, 2014) the distinctive features to outline the perimeter of the smart city, are essentially four:

- The extension of the city on the territory
- The infrastructures that make up the city skeleton
- The people who animate the city
- The political and administrative guide of the city.

However, the empirical literature has shown how we can easily move away from the scientific dictate and how "one of the characteristics of smart cities is that they are all constitutively different from one another" (Bonomi & Masiero, 2014, p.108). When talking about Smart City, the European Union refers mainly to the Set Plan, i.e. the Strategic Plan for Energy and Technology, whose objective is the energy savings of European cities using renewable resources, without, for example giving importance to social inclusion as to the active participation of the social structure. Some cities, especially European cities, based on specificity and territorial needs, have focused on smartness, but only in certain areas such as smart mobility, or smart living, or smart environment. Other cities have started real strategic programs to become Smart City assisted by some consulting companies that deal with Smart City such as IBM, Boston Consulting Group, etc. Several cities have adopted "smart" initiatives or projects without a real specificity, but simply to proclaim themselves "smart" and revive their image.

From here we see a gap between the concept of Smart City and its effective implementation, which means that, to date, there are still difficulties in identifying a holistic definition that is universally accepted by the academic, business and political world. As we have seen, we often experience definitions that, when removed from this context, find their reason to be, but which, when asked to face reality, cannot be applied. However, the innovative scope of the modernization and organization of cities seems to be relegated to two different dimensions. On the one hand, the multiplicity of meanings of which the smart city is imbued and which change according to the domain, shows how this phenomenon acts as a container for homogeneous but partial points of view and purposes. The smart city concept seems to act as a sufficiently generic "terminological umbrella" on which it is easy to obtain a broad consensus (is there any city that wouldn't like to be intelligent?)" (De Luca, 2012, p.144). On the other hand, the anthology on previous urban models has highlighted how, from the practical point of view, to say from the point of view of implementation policies, projects, actions and solutions, engineering approaches are generally preferred, and that these approaches have been selective "with respect to the urban areas and to the portions of the population affected by these interventions" (De Luca, 2012, page 145).

#### 4. Conclusions

In light of what we wrote, one understands how the smart city presents itself as an ideal type of city that combines technological and digital innovation with economic and environmental sustainability, and that this brings with it some questions. Why did you feel the need to transform cities into smart cities? What does being smart mean? And which cities are smart?

In recent times, we have started to ask ourselves whether our cities are smart and to which extent. And this need to always be on top of modernity, at the height of technological development has meant that we reasoned by virtue of a fetishism of ranking that sees cities compete with each other to win points that allow them more resources with the result of creating useless antagonisms that bring big cities to be bigger and more technological and small cities to be always smaller and less in step with the times. On the other hand, people were wondering if the cities were sustainable, because at that time sustainability was the dominant paradigm in the contemporary age, with the succession of economic crises and environmental disasters we went from defending ourselves from nature to defending nature (Senator, 2016). Just think that it still is, in synergy with technology. The cities were characterized as places of implementation of this paradigm, centers of policies marked by a sustainable future, respectful from a social, economic and environmental point of view, where the first objective had become the safeguard of the goods that the earth could (and still can) offer.

Then the question arises, legitimate and spontaneous, as a temporal connection between the evolution of sustainability and the new presence of smartness come to light. What is the difference, if there is any, between being “smart” and being “sustainable”? Does one concept exclude the other or can they live together in harmony? Cities and smart communities, however, maintain policies based on sustainable development, so much so that the six dimensions listed by Giffinger share the basic concepts of development, no matter if it is, as mentioned, environmental, social or economic.

The key difference lies in the presence of a technological layer (Ratti, 2013) traceable in the development of the stroke that allows interaction between people, organizations and places, as in the increase of mobile devices, making citizens powerful actors of the urban context both in terms of users of services and of critical indicators. So, the citizen is thought of as a sensor in a smart city that takes the principles of social inclusion and involvement. On the one hand, the grid technologies are too complex for people who are not constantly in contact with these specificities, but on the other hand the user is considered as a “resource man”, easily involved in the new logic. A man who will be easily influenced, even in the field of current fashion, in these solutions. A man, regardless of sex, age and social class, rationalizing their choices to decide for “good living”. Undoubtedly, we must consider the attractiveness of the “new” as the main push towards the perception of the subject not only as a spectator, but also as an actor. A subject that has evolved from a simple consumer to a producer, up to the point of questioning even this dichotomy to become “prosumer”. However, we can see that the growing development of applications and the diffusion of intelligent devices involves a narrow, though growing part of urban users, those who are defined as “technologically aware”, and this, led to extreme consequences, would worsen the inequalities created by the technological gap. Consequently, a smart city should ensure the hosting and development of applications, but also and above all include other events that involve less technological users (Murgante & Borruso, 2013). We have understood that one of the goals of the smart city is undoubtedly to save energy, possibly replacing it with renewable ones, and the efficiency of procedures that see citizens as social actors. But we also guessed as the goal should be social inclusion, through social cohesion, declined in “social protection, employment, education and vocational training, workers’ rights, health, housing, equal opportunities, non-discrimination and immigration” (Bonomi & Masiero, 2014, page 109).

Within such a complex framework, it is believed that integration, inclusion and governance are the key words on which to develop a city that is aware of its rich human and social capital, where people are the true drivers of innovation as responsible designers of smart cities more and more human and even more inclusive than they try to do. The reasoning that has been done, has led to note the overwhelming power of technology in many areas especially related to the concepts of efficiency and individualization: technology that improves, technology that excludes rather than including. And this led to the reasoning on the issues of sustainability, which, by reflecting, records a conceptual myopia



on the trajectories of this phenomenon. Nowadays, if we talk about sustainability, we tend to link this concept to the environmental factor, and to the economic factor, in its various meanings ranging from the search for efficiency to the reduction of waste. But sustainability is much more than environmental and economic sustainability. Within this concept are contained various dimensions, the most important of which is the social one, whose maximum objective is social inclusion, which, not by chance, is the goal to which the smart cities must aim. Social inclusion, within the smart sphere, means the internalization of that phenomenon by the whole city, means understanding the technological matrix, learning new systems and finally accepting them as dominant paradigms. So this reasoning suggests, however, a rethinking of the concept of a person, which is not and must not be defined by the technology that these new realities bring with them. Since sometimes, reasoning through abstractions, we lose the critical lucidity of drawing a clear demarcation between the individual and the person, which is not the same thing, because the individual acquires his role as a person when he enters relationship with the others.

In the same way as the individual / person reasoning, the studies show us the need for real cities that are not replaced by “virtual places”, as well as web connections that do not supplant interpersonal relationships, favoring an approach oriented to the centrality of the human dimension (Pultrone, 2014). What emerges therefore in conclusion is that the studies show us as if we do not change the social habits of citizens, if we do not aim at the inclusion of people in the urban context, the integration between the various social systems that Giffinger has listed as characterizing the smart city, if you do not think like a single integrated system, the change, the turning point towards the smart world, despite being in place, will not fully produce its effects.

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