PLANNING SMART CITIES FOR URBAN FUTURE

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Abstract. *Cities are rethinking future urban development, adopting a smart vision for urban growth, and improving citizens' quality of life. Following a smart approach to urban development, cities are designing and planning a smart community to transform the city favorably. Investing in the smart city helps to identify a sustainability-oriented pathway, addressing and developing smart and intelligent solutions to urban problems that rely on information technology as a source that enables cities to develop innovative processes and drive sustainable urban growth. Romanian and Italian cities are adopting a smart vision for the urban future, developing collaborative frameworks to drive innovation in services and knowledge to support urban development. Smart city projects and visions are necessary means to drive the pathway leading to smart and sustainable development that is still in the initial stage. A smart city view helps to support urban change and innovation.*

Keywords: *smart city, urban sustainability, smart city projects, smart communities.*

Introduction

Cities of the future are rethinking a smart vision for urban change and growth, developing and implementing smart city projects. A smart city view should enable the city to improve the quality of life of people living within sustainable urban communities.

Smart city-based development is emerging as a potential model for cities within the information and knowledge era (Yigitcanlar, 2015). Making a smart city without embracing a smart vision leading to sustainable urban development is not simple (Neirotti et al., 2014).

While designing a smart approach to urban development is well documented in the literature, few studies elucidate how cities develop the smart city as a project for urban community development, combining social, economic, institutional, technological, and environmental aspects (Camboin et al., 2019).

The aim of this study is to elucidate how Romanian and Italian cities are rethinking the future of urban communities, embracing smartness as a project-oriented vision for urban growth. Cities are rethinking a smart and project-oriented approach (Gil-Garcia, Nam, and Pardo, 2015). Smart cities rely on using information technology to improve human capital and increase urban sustainability and the future (Angelidou, 2016), and

optimize all city functions (Baltac, 2019) in order to support local growth (Bătăgan, 2012). Smart city projects and vision help construct a people-centered approach to urban development. Building smart cities involve promoting urban governance and bringing together human collaboration and technological systems (Meijer et al., 2016). Cities aim to achieve sustainable development by using information technology to support urban growth, knowledge, and an innovation-led economy, improving living conditions for citizens (Angelidou, 2015; Bătăgan, 2011).

Smart city initiatives help explore future scenarios of contemporary cities (Andreani, Kalchschmidt, Pinto, and Sayegh, 2019), fostering urban innovation through multi-level public-private partnerships and cooperation (European Commission, 2017).

A smart city project is an effective urban management model to help cities progress toward long-term urban development (Yigitcanlar, 2015). Cities plan a smart future, promoting the smart city and community projects (Camboin et al., 2019). Cities design a pathway to design organizational processes that enable cities to evolve as smart-driven inclusive urban communities (Kummitha & Crutzen, 2017; Ahad et al., 2020).

The paper is structured in the following way. After an introduction, understanding smart and sustainable cities for driving urban development is presented in the second section. In the third section, smart city projects and strategies aim to shape the urban future. In the fourth section, the issues of Florence's smart city planning and Brasov's smart city projects are described in order to define a future-oriented landscape. Finally, the discussion and conclusions are outlined.

Smart cities as drivers of sustainable urban human development

Cities embrace a smart vision to rethink and plan urban futures, providing human capital development to foster knowledge and creativity to improve citizens' and communities' quality of life (Camboin et al., 2019). Smart cities contribute to socio-technical urban development (Gil-Garcia et al., 2015). Smart cities promise the ideal future for urban communities and support sustainability-oriented pathways that open up to knowledge and innovation (Angelidou, 2015; Angelidou, 2016). Smart city solutions as a conscious choice help to support sustainable urban development (Bătăgan, 2011; Alberti & Susskind, 1996).

Community, technology, and policy drive smart cities, enabling productivity, sustainability, well-being, and liveability (Yigitcanlar *et al.*, 2018). A smart city view shapes guidelines for transforming the city, stressing the human features of city life (D'Auria et al., 2019). Cities promote smartness as a vision that enables the city to modernize urban services and infrastructures (Giffinger *et al.*, 2007), shaping a smart change-driven community (Deakin, 2014). Sustaining smart growth relies on designing smart cities and communities promoting innovation processes (European Commission, 2012), enabling the city to develop the potential of their knowledge sources to drive sustainable urban development (Knight, 1995). Smart city solutions support community innovation and improve urban functions and contexts (Allwinckle and Cruickshank, 2011; Stratigea , 2015).

Technology helps cities as social systems to improve the quality of life and contribute to sustainable development (Bătăgan, 2011). A smart city strategy combines global trends

and local aspects related to local culture and citizen involvement (Dameri et al., 2019). Cities adopt a smart strategy for engendering continuous urban development (Nam and Pardo, 2011a). According to Gil-Garcia et al. (2016) «a smart city should be seen as a continuum in which local government officials, citizens, and other stakeholders could think about the initiatives that attempt to make the city a better place to live» (p. 5). In particular, smart cities develop innovation, technology, and knowledge to promote effective services and growth policies (Komninos, 2013; Paskaleva, 2011).

Cities follow a smart approach to shape collaborative processes between people, business, and governments within urban communities as organizational spaces that enable urban public value and innovation by involving all the urban stakeholders (Hollands, 2008; Paskaleva, 2011). Cities select a smart approach using the potential of information technology in order to enhance systems, services, and capabilities in an organic network (Albino et al., 2015).

Smart cities contribute to sustainable innovation (Cocchia, 2014), enabling the urban stakeholders. Smart cities ensure technological excellence and provide a better urban space for a sustainable economy and society (Yigitcanlar, 2015). Developing a smart city vision relies on long-term urban planning and helps design truly smart cities and communities that improve the quality of life, promoting urban innovation in management, governance, and policy (Yigitcanlar *et al.* 2018, Chang et al., 2018; Nam & Pardo, 2011b).

Driving cities of the future through smart city projects

It is difficult to rethink the city as a smart community becoming smart without considering a planning and project view of urban design and strategy. Designing a smart city relies on a long-term process that concerns local contexts and views of urban sustainability (Ibrahim et al., 2017).

Cities need to have a long-term mindset to make a smart city (Camboin et al., 2019), following a project-driven view to transforming the city in favorable ways for supporting initiatives of urban sustainability (Eger, 2005), shaping inclusive urban communities (Osborne et al., 2013), developing the city's technological potential to support urban innovation and growth (Kollar et al., 2018).

Smart and community city projects challenge the ideas and visions of urban development (Baltac, 2019), by enhancing both collaborative and organizational dimensions of the city of the future (Camboin et al., 2019).

Smart city projects train the cities to identify a smart-oriented pathway, mobilizing the urban stakeholders to develop human-centered, collaborative, and technology-enabled processes for urban innovation (Angelidou, 2014; Andreani et al., 2019).

Developing smart city projects helps support smart urban innovation and entrepreneurial ecosystems (Ardito et al., 2019), enabling the citizens as key stakeholders and drivers of urban growth (Engelbert et al., 2019), and placing the city as a smart and inclusive community that drives urban regeneration and development (Allam & Newman, 2018). Smart cities and communities empower citizens and urban

stakeholders to promote social and technological advancements (Kummitha & Crutzen, 2017).

The role of technology is to support user-driven innovation, and collaborative and citizen-centered projects (Schaffers et al., 2011). Cities become smart communities improving some urban areas (Angelidou, 2014). Designing a smart strategy relies on technological infrastructures and connectivity platforms for new digital services and systems (European Economic & Social Committee, 2015). A smart city strategy relies on promoting technological and social innovations and infrastructures to improve urban quality of life sustainably (Angelidou, 2016; Bifulco et al., 2016). Citizens' quality of life is the main issue of smart cities and communities. Planning human and intelligence-driven smart cities relies on some elements: technological advancements, knowledge, and innovation networks (Angelidou, 2015). Smart city strategies tend to enhance the role of information technology in advancing knowledge transfer and innovation processes, failing to stress both bottom-up vision and citizen awareness (Angelidou, 2017). Driving smart city projects helps cities to face urban uncertainty and complexity, developing urban innovation for improving urban environments, following an integrated public and private governance (Meijer & Thaens, 2018, Camboin et al., 2019).

Methodological section

The study employed a qualitative, descriptive, and exploratory methodology to analyze how cities rethink their future development as inclusive, smart, sustainable communities. While cities are planning to transform urban environments into smart cities as an urban policy priority, they are rediscovering the smart city as an inclusive community. Some European smart strategy frameworks are reported and described below. Within European documents and reports, the need to drive sustainable growth relies on cities developing information technology to build smart, inclusive, and sustainable cities and communities as engines of urban innovation and socially inclusive growth. The study focuses on two case studies, Florence and Brasov, which refer to cities rethinking their urban future and redesigning the urban development planning by adopting a smart strategy to drive the city as a sustainable urban community. The cities' sample was selected by considering how certain historically and culturally different European cities address smart urban development. Two smart cities and their development planning for the urban future were selected to make illustrative and exploratory examples concerning a smart and human-driven framework to improve urban competitiveness, quality of life, and prosperity of urban communities. The study follows a multiple-case study methodology (Yin, 2009). The research methods involved case selection and data collection from policy documents in order to investigate how some European cities are rethinking and planning their urban future development. A descriptive case study research was employed to qualitatively analyze the smart city strategy adopted by municipalities (Angelidou, 2017; Angelidou, 2014; Mora & Bolici, 2017; Sancino & Hudson, 2020). Investigating strategic choices regarding smart city strategy design helps understand the pathway cities follow in building their urban future (Angelidou, 2014).

Promoting smart city projects and view for sustainable future and urban growth

Planning Florence as a smart inclusive and integrated city

In the document *Firenze Smart City Plan* (2015), the city of the future is will be a smart, intelligent, and sustainable community that answers to contemporary and future challenges to urban growth, by identifying cooperative and collaborative frameworks for urban governance, thus shaping a smart and sustainable future. The city of the future is a smart community that supports technological and social infrastructures to ensure a high quality of life within urban environments, putting the citizen first, and searching for inclusive spaces of collaboration, dialogue, and co-design that involve all urban stakeholders.

In the *Firenze Smart City Plan*, cities are living organisms made of people within the context of urban transformation through intelligent communities. Citizens play a proactive role in identifying the pathway of urban development by improving the quality of life for citizens living in an urban metropolitan environment. In particular, planning a smart urban vision helps the city as a community of people create meanings and produce culture, supporting creativity and thinking by putting the people as the first drivers of civil and social growth.

Promoting Smartness relies on using technology to make more innovative and sustainable cities. A smart city is changing and constructing new social, urban, and economic responses to environmental and historical pressures, reinforcing social relationships within the urban community. A smart city strategy develops an open innovation view to ensure the stakeholders' involvement by embracing the four *Is*.

A smart city master plan helps the city to drive continuous urban innovation, promoting the *integration* of competencies and background in charge of a municipality, *innovation* by developing innovative services, the *involvement* of stakeholders to identify a long-term vision, and providing *information* as a way to reinforce the relationships between municipality and citizens. The smart city plan is an open space for debate, confrontation, and exchange of information and knowledge among all urban stakeholders who contribute to urban, social, and economic development.

Planning the future of a Romanian smart city. Brasov

In Romania, a smart city is still planning for the future and is not yet implemented in reality. Smart city design is still in its infancy stage. Romanian cities are still in the first step of social and technological evolution and innovation (Bătăgan, 2012). Romanian cities believe in embracing a smart approach to promote the urban development of communities. Smart and intelligent solutions help cities to go into the future.

Technology's use has three possibilities for smart city implementation (Bătăgan, 2012): the use of facilities, and open data in areas that individuals have identified as basic (administration, education, health, and transport). This variant is aimed at an integrated operations center. This can facilitate access and sharing of information, coordinate city resources, and predict and solve problems faster. The use of efficient solutions for producing electricity using wind power and photovoltaic solar panels capture solar energy, free energy, clean and green. In this variant, monitoring and reducing carbon dioxide emissions and the efficient use of natural resources are important results. The

investments are made in a number of elements that create a high standard of quality of life for citizens and visitors, and tourist areas - parks, museums, and historical centers.

Brasov's smart city view develops the city as a social ecosystem by using the potential of information technology and focusing on community development. Smart governance's aim is relived in the future of high-efficiency services, a leadership community, using a wide range of mobile applications, and continuous evolution through innovation. Smart governance involves the use of technologies for streamlining decision-making and administrative processes. The "Smart City" strategy must be adopted in the context of an ecosystem, by a partnership that includes citizens, the business environment, organizations, and public authorities, which must share a common vision, starting from the community's needs and its active participation. A "Smart City" is a city that uses society's technological tools to provide community services at higher standards, for the benefit of its inhabitants - a "system of systems" operating in an integrated way.

Brasov smart city – projects concern: smart lighting; municipal Wi-Fi network; Intelligent public transport system: e-ticketing; Public safety: video surveillance in the municipality and educational institutes; Integrated technical dispatch; Geographic information system. SMART strategies concern: sustainable development strategy; integrated urban development strategy; sustainable Development Strategy 2030; sustainable urban mobility plan; an action plan for sustainable energy 2010 – 2020.

E-Administrative services concern: electronic portal services; geoportal; CRM platform; the e-learning platform. Smart lighting. Brasov Smart city – public illumination - inteliLIGHT® . There were installed 11500 lighting poles with 200 transformation posts. Their advantages are: rapid intervention. Announce any dysfunction by issuing app warning alarms; streamlining the intervention in the case of a dysfunction; monitoring and controlling from a distance.

Future projects concern: the purchase of 238 modern means of transport (buses); the construction of a Park & Ride; the creation of an integrated infrastructure for cycling and pedestrian traffic; the realization of special lanes dedicated to public transport in the entire city; Brasov Railway Station transport terminal; extend the Electric vehicle charging system in the entire city.

Conclusions

Driving smart city projects rely on a long-term horizon to support initiatives that open up to urban change. Promoting smart city projects helps identify potential urban development trajectories for social growth. Building smart, inclusive, and sustainable cities and communities rely on planning and developing technological and social innovations within urban spaces.

Florence's smart city planning focuses on the potential of information technology to improve the information needs of urban stakeholders and ensure integration within the urban community, to support citizen and community involvement to drive urban innovation. Developing smart inclusive cities relies on fostering stakeholders' participation and engagement, thereby shaping an inclusive urban community. Smart inclusive cities bring together integration, innovation, involvement, and information.

Technology enables citizens and the community to participate in processes that drive urban value creation, innovation, and sustainability.

In Romania, the smart approach helps modernize urban spaces and environments to improve citizens' quality of life. A smart strategy design is still in its infancy age. In particular, rethinking a smart city vision relies on promoting a top-down and techno-centric orientation that fails in driving social and economic urban growth. A smart city view should contribute to building urban intelligence and inclusive and sustainable communities, opening up to participatory and collaborative-oriented frameworks between city governments and urban stakeholders.

Cities are experimenting with new ways to develop urban innovation in services and functionalities. Following a smart urban development cities redesign urban planning coherently with a long-term horizon within livable urban environments.

Limitations emerge in the study. The Romanian case study shows how smart solutions help drive urban growth and development. This study sheds light on cities that aim to plan a smart-driven urban future. Further research would focus on smart city projects that enable both citizen participation and social innovation as issues of smart city strategies that open up smart urban environments as collaborative and organizational spaces for urban value creation and innovation.

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