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Driving smart inclusive cities

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Abstract. As smart communities, cities of the future use information and communication technologies to drive innovation and promote sustainable and inclusive urban growth, improving the quality of life, and developing the city as inclusive community. Sustainable and inclusive urban development relies on smart cities and communities. Cities select a smart city view to support collaborative and inclusive urban spaces. Smart cities shape the city as sustainable and inclusive community.

Keywords: inclusive cities, smart cities, smart communities, urban sustainability.

1. Introduction

Cities of tomorrow will be smart and inclusive communities. Cities contribute to continuous urban change, constructing a sustainable and wealthy urban future, using technologies to drive innovation-led and sustainable urban growth, improving the quality of life [1, 2, 3]. Intelligent cities promote multi-actor and collaborative processes, bringing together technology and people in order to drive inclusive and sustainable urban growth [4, 5]. As nodes of innovation smart cities help make inclusive cities, empowering citizens as co-designers and co-producers of services [6, 7]. As smart communities, cities develop cooperative and collaborative processes for innovation [8]. As engines of innovation, cities improve the urban competitiveness and contribute to ensuring better quality of life of communities in long-term horizon [6, 9]. Smart cities as communities drive sustainable-inclusive growth, empowering citizens as co-producers of social and urban value [10], strengthening productivity, economic growth, human capital, service systems and capabilities [11, 12].

As smart city is an interconnected and sustainable community [13], and engine of social and inclusive innovation [14], providing solutions for sustainable urban, social and economic development [15]. A smart city supports social quality of life improvement [13]. Smart urbanism opens to more inclusive cities [16]. As smart inclusive communities, cities put people first, and foster human and social capital at the heart of sustainable smart urban development [2]. Smart inclusive urban development relies on aligning human, social, cultural, economic and environmental factors by strengthening stakeholder engagement [17]. Cities adopt a smart city vision to support

sustainable urban growth [18]. Cities need to be intelligent communities in order to continue to live [19], and become spaces for social and inclusive innovation [20].

Smart inclusive cities enable technology and digital applications in order to solve urban problems and improve quality of life, focusing on citizens [21]. Inclusive cities support sustainable urban development, strengthening a collaborative and participatory space of action and strategy among public/private actors and urban stakeholders who support city continuity with change, stressing urban citizenship [22, 23].

Open, bottom up and inclusive cities promote sustainable growth, providing social and economic opportunities, strengthening community participation [24]. Smart cities focus on citizens and drive the city as smart community [25]. Smart cities contribute to shaping sustainable and inclusive urban communities [2, 26, 27]. The city is viewed as information, organizational and interactive space [28]. The city is viewed as a net action and inclusive space [29]. Cities contribute to collaborative processes that involve citizens, companies, and public authorities through digital spaces, adopting a human-centric view to sustainable development [30, 31]. As citizen-centered, co-production-led platforms, collaboration-oriented and innovation-led communities that improve quality of life, smart cities engage the wider community and transform management and services within smart sustainable urban ecosystems [5, 6, 32, 33].

The future of urban development relies on smart cities and smart communities. Cities are rethinking urban planning, following a sustainability-oriented and smart strategy, involving the stakeholders and the citizens, strengthening participation and multi-actor decision-making, and driving inclusive urban growth through collaboration among urban stakeholders for smart city/community innovation [34, 35]. The research gap relies on identifying smart cities and communities as drivers of innovation and social inclusion within urban communities. There are still few studies that focus on the smart city as a driver of innovative and inclusive cities and urban communities. The smart city view supports the city as an engine of social innovation and inclusion within urban communities. The research question refers to how cities are rethinking the urban future, adopting a smart vision by designing smart inclusive communities as engines of sustainable urban development. The aim of this study is to elucidate how a smart city vision helps drive smart inclusive cities and communities. The contribution of the study is to elucidate that smart city planning and strategy help shape the city as a community that drives urban innovation and social inclusion. Smart inclusive cities construct a wealthy future for urban communities. The paper is articulated in the following way. After introduction and methodological section, in the third paragraph cities are presented as inclusive communities. In the fourth paragraph, the smart inclusive city vision helps drive the city to support future development. In the fifth paragraph, three case studies (Paris, Wien and Florence) refer to a smart city vision and planning that is driving smart inclusive cities. Finally, discussion and conclusions are outlined.

2. Methodological section

The study analyses how cities are rethinking future development as inclusive, smart and sustainable community. This study is qualitative, descriptive and exploratory. While cities are planning to transform urban environments in smart city as urban policy priority, they are rediscovering the smart city as an opportunity to drive the city as inclusive community. The research relates to documents analysis. Some European smart strategy frameworks related to Florence [36], Paris [37] and Wien [38] are identified. The study relies on considering three case studies (Paris, Florence and Wien) that refer to cities which are rethinking the urban future, redesigning the urban development planning, by adopting a smart strategy as a vision for driving the city as sustainable urban community. The cities' sample has been selected by considering how some European, historically and culturally relevant and different cities are dealing with addressing a smart urban development in virtue of diversity of approach and following common pathways of social growth. The phenomenon of cities adopting a smart view to urban development to shape inclusive and sustainable communities is emerging and still in progress in contemporary times. These illustrative cases are used to explore a phenomenon that is still happening. The smart city frameworks reported shed light on the attempt to shape a smart inclusive city as innovative and emerging phenomenon, and enable cities to evolve as inclusive communities. The study refers to a multiple case study methodology. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly evident [39]. The research methods involved case selection and data collection from policy documents. In particular, smart city frameworks adopted by municipalities of Paris, Florence and Wien as policy documents are considered as information sources to collect in order to analyze data and information, and to investigate how some European cities are rethinking and planning the urban future development coherently with a smart city view by designing a smart and inclusive community as an engine of urban innovation and social growth. Descriptive case study research has employed for the qualitative analysis of smart city strategy adopted by municipalities to make the city as smart city and community [15, 40, 41, 42]. Following Yin's guidelines that ensure the regularity of the construct, planning, and execution of the case study, this methodology aims to provide a comprehensive understanding of the phenomenon at hand without the rigidity of a predefined structure for observations and analysis. Specifically, the methodology based on case studies refers to research concerning the relationships between the issues drawn by smart city framework planning and the impact on urban development and benefits for communities.

3. Cities as inclusive communities

Following the *UN 2030 Agenda for Sustainable Development* [43] cities need to be inclusive, safe, resilient, and sustainable urban communities. In the *New Urban Agenda* inclusive and sustainable cities and communities support economic, social and healthy growth [44]. As inclusive and socially sustainable urban communities, cities improve the quality of life, promoting social inclusion and integration, and developing

the well-being of the whole community, enabling cooperation and interactivity among public and private sectors [45]. Pathways to social inclusion develop through social change and rely on social and community-driven innovations and collaboration [46].

The future of cities relies on sustainable and inclusive urban communities. Cities are planning their urban development, integrating social, economic, environmental and territorial dimensions [47]. As inclusive spaces and platforms for collaborative innovations, cities support private, public, no profit actors, and citizens in interactive arenas for engendering new solutions that benefit urban communities [48]. Socially inclusive, sustainable and prosperous cities contribute to urban development and innovation [49], strengthening the community and social capital [50]. An inclusive city shapes human-oriented inclusive urban communities and supports sustainable urban development, by strengthening collaborative, participatory and multi-actor urban innovation, promoting the wellbeing of people, avoiding to enter into decline [22]. As social incubators of urban change and innovation, open and bottom up cities are engines of economic and social growth and belong to people [20, 24]. The primary focus of the city is its people and refers to urban spaces for social interaction [51]. Urban sustainability refers to social interaction and networks, participation within the community [52]. Supporting community initiatives and fostering inclusive and multi-level governance contribute to urban resilience implementation [53].

4. Smart inclusive cities

In the information age, smart cities and communities support social and community inclusion, shaping open, innovative and sustainable cities [4, 30]. The idea underlying the vision of smart cities is to design inclusive and sustainable urban communities, achieving social and technological issues [2]. Smart and truly inclusive cities improve quality of life and focus on citizen empowerment to drive long-term urban sustainability and inclusive growth [6]. The smart city model helps to provide a social response to urban growth [14]. Smart cities are progressive, socially-inclusive and sustainable urban communities [4, 6]. Smart cities contribute to urban sustainability, developing the social pillar for quality of life improvement [54]. Sustainable urban development relies on smart cities as engines of public value creation [55]. A smart city is a smart community that promotes inclusive growth, developing a healthy mixture of smart people, policies and technologies [56], and promoting the wellbeing for all members of the community, enabling collaborative processes within urban spaces [27, 57]. A smart city view supports community development for urban change and open innovation [6, 58]. Cities develop smart and sustainable solutions, fostering collaboration among all the urban stakeholders to drive urban innovation and achieve sustainability [3, 45]. Smart cities employ strategically and extensively information technology in order to improve the quality of life within urban communities [25, 59], meeting the needs of the future without compromising the rights of future generations [60]. As smart and inclusive communities, cities connect human, institutional and technological components of urban environments [61], making sustainable as well as inclusive and people-centered communities [21]. Cities will be smart communities,

sustainable, healthy, and exciting places to live and work, and open collaborative spaces to the active participation of all urban stakeholders [2]. Smart cities support a collaboration-led and human-centered view to urban development [8, 48]. Smart city initiatives help community engagement and enhance citizen participation in urban governance [62]. The smart community develops collaboration, cooperation and partnership among voluntary, education, private and public organizations, and citizens [63]. Cities adopt a smart vision in order to drive sustainable and inclusive growth and support innovation [34]. As engines of inclusive urban growth, smart cities and communities enable multi-level and multi-sectoral interactions, fostering co-designed innovative solutions [49]. Cities employ information technology in order to shape socially innovative and inclusive communities [64], and support sustainable urban growth by managing efficiently resources for knowledge and innovation assets [65]. Cities adopt and implement a smart strategy by developing community, technology and policy for sustainable and inclusive urban growth by empowering the citizen [10, 56]. As intelligent communities, smart inclusive cities use technology to design human-centered and digital social urban spaces in order to encourage diverse stakeholder participation in urban growth, to foster collaboration and social networking [66, 67]. Smart city visions focus on human and social capital, and stakeholder engagement [68]. Smart cities contribute to driving sustainable urban development, improving and extending the wealth of people within a community [69, 70, 71]. Technology helps empower users and citizens for more informed and intelligent behavior [72].

5. Planning smart inclusive cities of the future

In this research three case studies are considered and presented. The smart vision planning of some European cities helps us understand how cities are rethinking their urban future in terms of sustainable and inclusive growth. Smart inclusive cities put the people as the first actor of human and civil progress. Cities adopt a smart vision in order to drive collaborative processes and spaces, to improve the quality of life of citizens, and shape inclusive and sustainable cities of the future.

In the *Firenze Smart City Plan* [36] cities are living organisms made up of people within the context of digital urban transformation that enables intelligent communities. Citizens play a proactive role in identifying the pathway of urban development by improving the quality of life for each and every citizen living in an urban metropolitan environment. In particular, planning a smart urban vision helps drive the city as a community of people and engine of meanings creation, culture production, creativity, and thinking. Promoting smartness relies on using technology to make cities more intelligent, sustainable, capable to drive innovation, and reinforce social relationships within the urban community. A smart city refers to a city that is changing and constructing new social, urban, and economic responses to environmental and historical pressures. The smart city plan is an open space for debate, confrontation, collaboration, exchange of information, and knowledge among all urban stakeholders (public administration, research centers, cultural institutions, businesses, associations,

groups, citizens) involved to support urban, social, and economic development. A smart city master plan helps the city to drive continuous urban innovation, to improve the quality of life within community and to develop sustainable urban planning that relies on clear and strong distributed and collective leadership and vision. Information technology is a critical successful factor and facilitator of all smart city actions and initiatives. A smart city strategy develops by promoting open innovation to ensure the stakeholder involvement by embracing the four *Is*: *integration* of all possible aspects and sectors in charge of municipality's competences and background; *innovation* means development of innovative services and approaches, and relies on the potential offered by digital and interactive information technology; *involvement* is conceived as a means to urge stakeholders to identify, plan, share, and implement strategic, long-term vision and goals more ambitious than the present situation; *information* is related to the use of information technology as a way to reinforce the relationships between municipality and citizens with regards to the monitoring of the implementation of smart urban strategy and policies.

In the *Smart City Wien Framework Strategy* [37] the 2050 vision relies on some key concepts: quality of living, sustainability, prosperity, opportunities for education and workplaces. The role of information and communication technology is to simplify the life of people and contribute to better quality of life. Promoting smartness supports urban change processes. As smart communities, cities do not let anybody down and integrate the social component in the development process, focus on initiatives for social inclusion and ensure quality of living, enabling people participation. A smart and sustainable city strategy relies on rethinking urban governance models, strengthening co-ordination and cooperation as ways for constructing shared, collaborative and multi-actor processes that involve all the stakeholders within the urban community, strengthening the cooperation on smart city issues with universities and research centers and institutions in order to stimulate social innovation vision and engender opportunities for experimenting new opportunities for urban value creation. Developing a smart strategy relies on strengthening the participation possibilities of citizens and experts, on promoting co-determination and management by taking account of the needs of all residents, meeting the needs of many different population groups, recognizing this diversity, maintaining both high levels of safety and social security, leisure quality and culture, openness, diversity, and maintaining high standards of public services, healthcare system, strengthening co-determination and participation to ensure democratically modes of governance that support the urban development and drive social innovations. Wien smart city supports social inclusion, stimulating social innovations and sustaining both social and technological developments more strongly inspired by the needs of citizens, and taking particular account of the interaction between individuals and organizations.

In *Paris Smart and Sustainable looking ahead to 2020 and beyond* [38] the role of a city using technology for becoming a smart and sustainable community is to improve the quality of life. Smart and sustainable city acts as a platform that is open, innovation-oriented and future-driven. Smartness is a means to drive the city towards a sustainable future related to quality of life improvement. Developing the city of the future means to bring together social, technological and organizational aspects and

relies on three pillars: the *connected city* (the tool) relies on constantly changing infrastructures such as communication networks and continually integrating technological advances; the *open city* (the method) relies on stimulating citizen participation and collaborative projects, exchanging, sharing and co-creating with researchers, scientist and academics, strengthening innovation ecosystem and promoting public innovation by transforming public administration, simplifying processes, and improving public services through city employees who contribute to reinventing the administration with their ideas and practices; the *sustainable city* (the goal) is a place where the technology serves people, improving their inclusion in city life by allowing them to be involved in creating public services and policy decision-making processes. Smart cities are places where technologies support people and help include them in the city life, bridging the gap between new public services and policymaking. In particular, a smart and sustainable city relies on the intelligent work of citizens and enables people to face global challenges and play a proactive role in building the urban future.

6. Discussion and conclusions

Smart inclusive cities contribute to achieving urban sustainability and ensuring high quality of life, making wealthy urban communities as collaborative spaces and *loci* of innovation, empowering citizens as co-producers of policies and services. Inclusive cities use the potential of information technology to develop smart urban communities and drive inclusive social growth, identifying a pathway to future urban development. Smart city applications contribute to shaping sustainable urban future development. Smart, open and inclusive cities contribute to continuous urban development and innovation, ensuring better quality of life within urban communities. Cities are planning a smart urban vision in order to support social inclusion within urban spaces and enable technology-enabled communities that support urban collaborative spaces. The smart city planning of three European cities supports processes of social innovation and inclusion, shaping urban collaborative spaces where private and public actors, and citizens contribute to services co-production, innovative and creative solutions for sustainability and value creation within urban communities.

The Paris sustainable city vision enables the role of technology as a means to make the city as connected and inclusive community, as organizational and informational space by engaging citizens and developing the open city as an engine of collaborative processes, strengthening participatory policy-making processes and services to drive social and inclusive growth. In the Wien smart city framework, the use of technology supports the community development and helps drive the city as inclusive community, opening up to collaborative processes that support urban value creation and innovation processes. Technology is a means to enhance co-participation, co-decision-making and support social inclusion as strategic and organizational view to sustainable urban development. In the Florence's smart city planning the focus relies on using information technology to ensure information and improve integration, to support citizen and community involvement in order to drive urban innovation. Developing smart city relies on fostering stakeholder participation and engagement, shaping inclusive and innovative urban communities. Technology enables citizen participation

and community development in urban value creation processes, innovation and sustainability.

As smart inclusive communities, cities drive continuous social innovation, strengthening stakeholder involvement and participation. Smart inclusive cities contribute to future urban development, identifying a community-oriented vision, adopting a human-centered view and promoting collaborative processes for co-construction and co-innovation of smart and sustainable urban pathways. Smart inclusive cities and communities adopt a human-centered and participation-oriented view to urban growth, dealing with technology, so making the city as a better place for engendering collaborative and open processes that empower citizens and support services co-production, social innovation and inclusion within urban environments.

In the study there are theoretical, organizational, managerial and social implications. Smart inclusive cities contribute to human-led and community-centered cooperative processes that drive open and socially innovative urban communities. Smart solutions support social inclusion and enable the city as a collaborative space for urban innovation and value creation. A smart inclusive city stresses the city as open organizational space and engine of social and economic growth and innovation, and relies on citizen empowerment and developing managerial skills and competences.

There are some limitations. The study is exploratory. Only three illustrative case studies are considered. In the analysis the adoption of a smart city vision and planning supports inclusive urban communities. As smart communities, cities adopt a smart vision to support socially inclusive and collaborative spaces and shape a sustainable urban future in long-term horizon. Future research perspectives imply to investigate how the discourse about planning and designing the smart city vision is leading to designing and developing inclusive and sustainable cities and communities within the context of Italian cities.

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