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Key Elements of Innovative Administration to Build Smart Cities

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Abstract: Innovation in public administration as a "mode" of functioning may greatly contribute to creating new avenues of development for entire local communities that can be transformed into more inclusive, better equipped to respond to citizens' needs and resilient communities. The article also pursues the objective of emphasizing the links (and the complexities of these links) between local government or local public administration, innovation and the specific elements or aspects that are fundamental in creating or transforming cities into smart ones. As already established by the scientific literature of the last decade, innovation *does* take place in the public sector and embraces several specific forms or categories which can become instruments of great improvement of the quality of government, at both national and local level.

Keywords: innovation; smart city; e-government

1. Introduction: Current Context, Innovative Administration and the 'Smart City'

Innovation in public administration is a topic of real interest as it offers so many potential ways of finding solutions to various challenges posed by the environment in which public administration is working daily. At the same time innovation as a "mode" of functioning may greatly contribute to creating new avenues of

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development for entire local communities that can be transformed into more inclusive, better equipped to respond to citizens' needs and resilient communities.

In the past decade, public administration has rapidly transformed to integrate electronic devices as well as the newest technologies, evolving into a new form of government or administration most usually referred to as e-government or e-administration. This new model represents now the prevalent type of administration, being, in fact, one of the most significant evolutions of public administration.

Public administration in its classic acceptance and due to its multi-disciplinary nature defies any universal definition, as it is so much dependent on the context and 'time-space' characteristics that influence its organization and development. There is also the wide variety of perspectives to be taken into consideration when trying to select a definition of public administration, such as the legal perspective, the sociological perspective, managerial perspective, psychological perspective, to name only a few, or maybe the fundamental ones, from which a multitude of possible combinations of scientific research branches may result. From the legal perspective, public administration, in its most known definition, is the activity of the execution of the law, and as such 'public administration involves the activities of government including implementing policies, overseeing distribution of benefits, collecting taxes and overseeing programs' (Beckett, 2007, p. 698).

Nevertheless, the current events and phenomena taking place in the environment in which public administration has to function have exerted a great pressure on public sector organizations, public services, public managers and political figures, forcing public administration to transform and adapt. E-government, in its essence, has to be seen as an adaptation of the 'classic' public administration to better adjust to contemporary social life, by combining traditional means and processes with the use of the newest technologies and other innovative processes to carry out all the specific activities of organization, coordination and public service delivery. E-government is defined by the European Commission as 'the use of information and communication technologies in public administration combined with organizational change and new skills in order to improve public services and democratic processes and strengthen support to public policies' (Communication of the Commission, 567 final, 2003, p. 7). In a simplified version, e-government is 'about using the tools and systems made possible by information and communication technologies (ICTs) to provide better public services to citizens and businesses' (European Commission, 2010, p. 31).

All around the world, public administration needs innovative perspectives, ideas and leadership to make sure e-government reaches its maximum potential. Several facets of e-government, mainly citizen-centred services, information as a public resource, new skills and collaborative connections as common practice, new models of management and accountability, are likely to have long-lasting effects on public administration (Brown, 2005, p. 241).

At the level of local public administration, the concept of e-government is very closely related to that of 'smart city'. One of its main features, namely using technology and innovation, is also expressed by the concept of 'smart city'. Smart city as a notion has evolved over time and expanded to make room for a new one – 'smart communities' – to comprise both urban, especially cities, and rural communities.

Holding the promise for a better future, the 'smart city' has been explored and highlighted by a wide range of scholars, whereas the depth and variety of research in the field keeps growing. As already established by the scientific literature of the last decade, innovation *does* take place in the public sector and embraces several specific forms or categories which can become instruments of great improvement of the quality of government, at both national and local level. The present paper pursues the objective of analysing the links (and the complexities of these links) between local government or local public administration, innovation and the specific elements or aspects that are fundamental in creating or transforming cities into smart ones.

The article also investigates the scientific literature on the concept of 'smart city' to establish and clarify the main characteristics of such community and favours an integrative or 'hybrid' framework (Appio, Lima, Paroutis, 2019) that goes beyond the 'technological determinism' (Engelbert, van Zoonen & Hirzalla, 2019). As such, it emphasizes the importance of a citizen-centric perspective for a continuous transformation of cities in order to offer the most appropriate solutions for the wellbeing of citizens, enabling them to organize and carry out their daily activities, with maximum benefits.

2. Smart City: The Complexities of its Definition and Real Life Existence

Many authors have called attention to the lack of a *universally acknowledged* definition of a smart city, emphasizing the fact that there are so many definitions of a smart city, but not a „one-size-fits-all" definition of it (O'Grady, O'Hare, 2012; Albino, Berardi, Dangelico, 2015), whereas others have pointed out that „theoretical literature is inconclusive… including the very essence of what a "smart" city actually is" (Wolfram, 2012; Hollands, 2008, 2015; Mora, Bolici & Deakin, 2017; Angelidou, 2017). "Smart city" has even been labeled "a fuzzy concept" by several scholars (Albino, Berardi & Dangelico, 2015, p. 4; Nastjuk, Trang & Papagiorgiou, 2022; Desdemoustier, Crutzen & Giffinger, 2019).

Even if there are so many definitions that seem to not capture exactly the fundamental features of what a smart city is, the scientific research shows also a great recognition of the importance of establishing as clearly as possible the characteristics to be taken into account for a community to be considered a smart one. In order to select a definition of the smart city, the present research has analyzed

various resources, acknowledging the fact that there are various streams of conceptualizing the smart city, based on various criteria. Within the current study, in order to explore and present an accurate definition of the concept, two of the many perspectives from which the smart city may be defined have been chosen, namely the technical and the holistic one. The holistic approach is promoted by European scientific publications that have contributed to a comprehensive understanding of the complexities of the smart city, incorporating concepts such as human and social capital, governance, sustainable development, the environment, and so on. The more technical view, in its turn, is proposed and sustained by the American corporate world's grey literature on technology and data-driven knowledge (Desdemoustier, Crutzen & Giffinger, 2019).

Whereas the technocentric view of the smart city emphasizes the role of technology and the use of ICT in urban infrastructure to ensure more efficiency, almost without taking into consideration the human factor, the holistic one considers that technology in itself is not enough to transform a community into a smart one, as there are so many other factors that have to play their role in the ecosystem of a smart city. According to this view the human element, in its complex aspects, such as human capital, human resource, known to be as a driving force of transformation of the workplace culture in any organization and human infrastructure, occupies a central position. The attentive evaluation of this perspective has caused that the focus of our study to have been placed on the holistic approach, since this perspective embraces a greater variety of features for the smart city and allows for more flexibility in defining, adapting and updating the concept of the smart city. In our opinion, a community cannot be considered smart only because of the use of technology, simply because a community represents a unique juxtaposition of several layers, such as people, territory and political-administrative power, which in their turn have their own components and specificities that form the very texture of the reality or realities of that community. Technology is important, but technology has to be managed by the people and for the people, not instead (or worse) against the people, no matter how advanced that technology may be. This is why, the main theme of our study refers to key innovative elements of administration, as it intends to explore and present the complex combination of aspects of administrative and political power and the innovative ways in which this power can use, set in place and develop various forms of innovation, technological one included, to ensure that their city (or any other local collectivity) functions efficiently and offers all the benefits of a smart community. The transformation of public administration generates new management styles and places great attention on the role of innovative elements to be introduced at the level of local government, especially in the cities.

3. 'Hard' and 'Soft' Elements of Innovative Administration in Smart Cities

At the beginning of the twenty-first century, city governments are confronted with a growing number of intricate socio-technical issues as well as unusual difficulties pertaining to important domains like public services, education, safety, sustainable development, energy and the environment. As a result of these difficulties, cities have devised various policies that, in an effort to increase wealth and public value in the city, make innovative and creative use of modern information technology (IT). It is believed that the use of new technology will have the power to change organizational problems and governance and will improve and make government more adaptive and responsive (Rodriguez-Bolivar & Alcaide-Munoz, 2019).

Against the background of growing societal, economic, environmental issues, along with political and military tensions and all related phenomena, new forms of city management have emerged in order to find solutions to these challenges. It is understood that the current challenges are also present and impact local communities. City governments have created IT-based strategies to transform urban governance, making it more transparent and responsive to citizen needs. This has been reported as a primary goal within the context of smart cities and the smart cities movement (Rodríguez-Bolívar, 2016).

A very useful synthesis of the three main facets or dimensions of a smart city may be found in the study of Nam and Pardo (2011) who present them as being: technology, human and institutional. The technological one refers to the use of ICT solutions and newest technologies, whereas the 'human dimension' takes into consideration the role of people or the citizens and their 'capital', in terms of knowledge, education, solidarity, agents of change and innovation, collaborating with the institutions and other structures of the local administrative power. The interplay between these three main components being a unique one generates a multitude of possible scenarios that will influence the ways in which that community will be able to forge (or not) its own path towards development.

It is interesting to see how the evolving scientific literature in the field has established, analysed and expanded on these three dimensions. For instance, according to several scholars (Caragliu, Del Bo & Nijkamp, 2011; Zhilin, Klievink & de Jong, 2019) there are six fundamental elements for a smart city framework, namely: 'the wide use of infrastructure', 'a business-driven urban development', 'the significant role of high-tech and creative industries', 'social and environmental sustainability as a crucial aspect' and two other very significant aspects like 'the role of social and relational capital' and the 'goal of inclusion of all social classes in service provision'. We consider that the relational capital and the social inclusion goal are mandatory elements to be included in any strategy designed to create a smart community. Along very similar lines, other scholars (Lee, Hancock, Hu, 2014)

identified, in their turn, six features: urban openness, service innovation, partnership creation, urban proactiveness, infrastructure integration, and smart city governance, acting as six main facilitators of smart city development.

These 'facilitators' were also classified as 'hard' and 'soft' (Angelidou, 2015). Thus, all the information technology (like sensors and connected devices, or fiber optic networks or ICT-based frameworks, among many others) and its strategies are labelled as the 'hard' smart city component, whereas the human component (human capital and its efforts in domains like research, innovation, education, etc.) are the 'soft' component (Angelidou, 2015; Appio, Lima & Paroutis, 2019). Although useful for adding a sense of clarity, the classification into 'hard' and 'soft' is by no means reductive, the author herself (Angelidou, 2014) calling attention to the necessity to "see" the 'transboundary nature' of the smart city model that goes beyond a simple dichotomy, to include other relevant aspects, such as the 'national' and the 'local' levels, the 'new green field' and the 'existing brownfields' approaches of urban development (Appio, Lima & Paroutis, 2019, p. 1).

A bold and original perspective, like the 'Triple Helix' framework (Leydesdorff and Deakin, 2011), updated as 'Quadruple Helix' (Leydesdorff, 2012) sustain the view that the smart city initiatives offer a distinctive platform for innovation for businesses, governmental organizations, and scholars. According to this viewpoint, smart cities are primarily seen as 'intelligent communities' which are cooperative ecosystems that foster innovation by establishing connections between the people, the government, private enterprises, and academic institutions. These creative clusters support the growth of the 'knowledge economy'. In addition, Bill Hutchison (Hutchison et al.; 2011) developed a five-level pyramid structure known as 'Intelligent Community Open Architecture or i-COA', to encompass the majority of these components and to generate a new model of governance appropriate for the smart city.

What has been dubbed 'smart governance' (Giffinger, Fertner, Kramar, Kalasek, Milanović & Meijers, 2007) is a new governance model for smart cities that focuses on building interactive, participatory, and information-based urban environments. This new model is conceived as multifaceted, rather than solely technocratic, including a plurality of aspects related to governance, and discarding the technocentric conception which is viewed by many scholars and professionals alike as extremely narrow in scope and reductionist in approach (Kitchin, 2014). There is also great attention given to the improvement and transformation of public services as they form an important element that ensures a higher quality of citizens' lives.

According to this model of governance, the definition and existence itself of a smart city now centers on citizens' involvement in city management. The implementation of this concept raises citizens' democratic participation in city government, which fosters greater social consensus and improves their quality of life (Dameri 2012,

2017). Thus, the two main tools to be used by modern smart cities are innovation and the application of smart technology to municipal administration. As a consequence, the main goal of this article is to analyse and highlight the imperative of mixing together innovation in technology and innovation in organization and various other processes of administration, including e-participation and other creative ways in which citizens have to be made co-creators of their own services. In order to reach individuals and encourage their involvement in public affairs, IT is intended to assist governments in smart cities in improving e-participation and inducing a greater sense of responsibility for their own living within the community for all the citizens.

An important additional element which is more and more referred to and included within the set of features associated with the smart city and its governance is sustainability. This focus on sustainability as a fundamental dimension of the cities of the future is actually very significant, given the drastic changes occurring in the environment and the irreversible and massive consumption of resources, mainly by cities themselves, which has only accelerated in recent decades. It seems that this evolution has raised much concern on the part of various international organizations, institutions and political representatives. Numerous times, several senior EU officials, in agreement with the UN experts, reiterated and emphasized the urgent need for action. For example, at the 'Fit for 55' package acceptance ceremony, European Commission President Ursula von der Leyen declared the EU's intention to leave a 'healthy planet', 'good jobs' and increased wellbeing to the generations that come after us and have the right to enjoy their life on the planet (Pătrașcu, 2022). This type of political statement proves the urgency of combating climate change and serve as an example of the European Commission's vision and policy plans in this area. The EU's institutions inscribed on their political agenda the goal of reversing climate changes and resources consumption. The ongoing political and legislative activity that picked up steam in the last years demonstrated once again the crucial importance of this goal. Even more, to support these initiatives, the EU linked the 'green transition' with the 'digital' process, creating a new political commitment that became known as the 'twin transition'. In this way, the two significant movements are combined to increase their effectiveness and benefit from one another's knowledge, resources, and results (Pătrașcu, 2022).

4. Conclusion: Are Citizens Co-Creators of their Smart City?

Scientific literature in the field has emphasized that a smart city may be defined or considered as such when it makes widespread intelligent use of ICT and possesses the 'social infrastructure' which ensures 'sustainability and active engagement of citizens' (Caragliu, Del Bo & Nijkamp, 2009). At the same time, an important stream of scientific research called attention to the paradox of citizens' participation in

building their own smart communities. Despite the relatively widespread opinion that citizens should play and are actually playing an active part in the co-creation of the smart city, various scholars have even talked about the exclusion of citizens from the European smart city (Engelbert, van Zoonen & Hirzalla, 2019). Along these lines, we sustain the principle that the most suitable way towards smart living and smart democracy could only be by acknowledging and granting citizens' smartness its due place and voice at the decision-making table.

To maintain a necessary balance between the technology, or the (so-called) 'hard' component of a smart city, and its human dimension, or 'soft' element, it is vital to take into account end users' viewpoints and their unique contexts and needs. This will allow the smart city to become more than just the ambitious project of 'urban technocrats' (Kitchin, Colette, Evans, Heaphy & Mac Donncha, 2017; Engelbert, van Zoonen & Hirzalla, 2019). It is interesting to notice that in newer ICT studies, as well as in urban and various social studies, terms like 'participatory design', 'urban living labs' and 'co-creation' are frequently used to describe the idea that smart city technologies should be developed and tested in partnership with city residents rather than being implemented in a top-down style (Engelbert, van Zoonen & Hirzalla, 2019, pp. 347-48). Scientific research promotes a model of smart city built in a 'bottom-up' style of governance which allows citizens to co-participate in the transformation of their communities. Within this model, the key components are the wide public participation in the planning and execution of interventions, as well as constant commons circulation, which fosters ongoing innovation and information dissemination. In this instance, the worldwide creation of 'commons' will result in a more sustainable city model that might outperform the current prevalent model and address a number of systemic issues (Kostakis, Bauwens & Niaros, 2015, p. 123). To create and sustain such type of smart community, the development of a distinctive culture is essential for improving user participation. This can be achieved by putting into practice modest, low-budget initiatives that have few regulatory constraints and encourage people to recover public open spaces in metropolitan areas. Local authorities of public administration could make their contribution by supplying the necessary infrastructure to support the implementation of participatory working methods, which will aid in generating social innovation results. This might be accomplished by encouraging the construction of various collaborative spaces across the city, the creation of social entreprises, as well as by setting up networks that will improve cooperation and communication among city residents. Innovative business models could undoubtedly result from this, and social enterprises will be more concerned with long-term development and sustainability than with quick financial advantages (Kostakis, Bauwens & Niaros, 2015, p.123).

Ignoring people's needs and aspirations seems to be a discernible trend in political discourse and actions related to the smart city development. Only by including the human dimension as a mandatory component of the smart city model, local

administration will be able to create the sustainable, innovative and resilient smart community capable to solve the rapid and distressing issues of contemporary society and gain more public value and wellbeing for all.

Acknowledgmet

References

Albino, V.; Berardi, U. & Dangelico, R. M. (2015). Smart Cities: Definitions, Dimensions, Performance, and Initiatives. *Journal of Urban Technology*, *22*(1), pp. 3–21.

Angelidou, M. (2014). Smart city policies: A spatial approach. *Cities*, Volume 41, Supplement 1, pp. S3-S11.

Angelidou, M. (2015). Smart cities: A conjuncture of four forces. *Cities*, Volume 47, pp. 95-106.

Angelidou, M. (2017). The Role of Smart City Characteristics in the Plans of Fifteen Cities. *Journal of Urban Technology*, *24*(4), pp. 3–28.

Appio, F. P.; Lima, M. & Paroutis, S. (2019). Understanding Smart Cities: Innovation ecosystems, technological advancements, and societal challenges. *Technological Forecasting and Social Change*, Volume 142, pp. 1-14.

Beckett, J. (2007). Chapter 18. Five Great Issues in Public Law and Public Administration. In Rabin, J.; Bartley Hildreth, W. & Miller, J. G. (eds.) (2007). *Handbook of Public Administration. Third Edition*. Boca Raton: Taylor& Francis Group, pp. 697-719.

Brown, D. (2005). Electronic government and public administration. *International Review of Administrative Sciences*, 71(2), pp. 241-254. Available at http://ras.sagepub.com/cgi/content/abstract/71/2/241.

Caragliu, A.; Del Bo, C. & Nijkamp, P. (2009). Smart Cities in Europe. *Journal of Urban Technology*, 18(0048).

Dameri, R.P. & Ricciardi, F. (2017). Leveraging Smart City Projects for Benefitting Citizens: The Role of ICTs. In: Rassia, S. & Pardalos, P. (eds.). *Smart City Networks. Springer Optimization and Its Applications*, vol. 125, Cham: Springer.

Dameri, R.P. (2012). Defining an evaluation framework for digital city implementation. *IEEE International Conference on Information Society*. London.

Desdemoustier, J.; Crutzen, N. & Giffinger, R. (2019). Municipalities' understanding of the Smart City concept: An exploratory analysis in Belgium. *Technological Forecasting and Social Change*, Volume 142, pp. 129-141.

Engelbert, J.; van Zoonen, L.; Hirzalla, F. (2019). Excluding citizens from the European smart city: the discourse practices of pursuing and granting smartness. *Technological Forecasting & Social Change*, 142, pp. 347–353.

European Commission (2003). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. The Role of eGovernment for Europe's Future, COM 567 final, Brussels.

European Commission (2010). *Annex 2* to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Towards Interoperability for European Public Services. COM 744 final. Bruxelles.

Giffinger, R.; Fertner, C.; Kramar, H.; Kalasek, R.; Milanović, N. & Meijers, E. (2007). *Smart cities - Ranking of European medium-sized cities.* (SRF), Vienna University of Technology, Vienna, Austria. https://www.researchgate.net/publication/261367640_Smart_cities__Ranking_of_European_medium-sized_cities.

Kitchin, R. (2014). The real-time city? Big data and smart urbanism. *GeoJournal* 79(1), pp. 1–14.

Kitchin, R.; Colette, C.; Evans, L.; Heaphy, L. & Mac Donncha, D. (2017). Smart cities, urban technocrats, epistemic communities and advocacy coalitions. *The Programmable City Working Paper* 26. Accessed 2.08.2024 at: https://osf.io/preprints/socarxiv/rxk4r.

Kostakis, V.; Bauwens, M. & Niaros, V. (2015). Urban Reconfiguration after the emergence of peer-to-peer infrastructure: Four future scenarios with an impact on smart cities. In: Arya, D. (ed.) (2015). *Smart Cities as Democratic Ecologies*. Basingstoke: Palgrave Macmillan, pp. 116–124. Accessed 2.08.2024, https://www.p2plab.gr/en/wp-content/uploads/2015/10/Palgrave-Macmillan-Chapter.pdf.

Lee, J.H.; Hancock, M.G. & Hu, M.-C. (2014). Towards an effective framework for building smart cities: lessons from Seoul and San Francisco. *Technological Forecasting and Social Change*. Volume 89, November 2014, pp. 80-99.

Leydesdorff, L. & Deakin, M. (2011). The Triple-Helix Model of Smart Cities: A Neo-Evolutionary Perspective. *Journal of Urban Technology*, Volume 18, 2011, Issue (2), pp. 53–63.

Leydesdorff, L. (2012). The Triple Helix, Quadruple Helix, …, and an *N*-Tuple of Helices: Explanatory Models for Analyzing the Knowledge-Based Economy? *Journal of the Knowledge Economy*, Volume 3, pp. 25–35.

Nam, T. & Pardo, T. (12-15 June, 2011). Conceptualizing smart city with dimensions of technology, people, and institutions. *Conference: Proceedings of the 12th Annual International Conference on Digital Government Research*, DG.O 2011, College Park, MD, USA.

Pătrașcu, C. (2022). EU's Innovative "Missions" and Convergence Tools to ensure the "Twin Transition" towards Smart Cities and Communities. *Bulletin of the Transilvania University of Brașov, Series VII: Social Sciences and Law,* Vol. 14(63) Special Issue, http://webbut.unitbv.ro/index.php/Series_VII/article/view/1035.

Rodriguez Bolivar, M. P. & Alcaide Munoz, L. (eds.) (2019). *E-Participation in Smart Cities: Technologies and Models of Governance for Citizen Engagement*. Springer Nature.

Rodriguez Bolivar, M.P. & Meijer, A. (2016). Governing the smart city: a review of the literature on smart urban governance. *International Review of Administrative Sciences*, 82(2), pp. 392-408.

Zhilin, S.; Klievink, B. & de Jong, M. (2019). Community Self-Governance in the Smart City: Towards a Typology. E-Participation in Smart Cities: Technologies and Models of Governance for Citizen Engagement. *Public Administration and Information Technology*, vol. 34. Springer, Cham.