



A Sociotechnical Framework for Smart Urban Governance: Urban Technological Innovation and Urban Governance in the Realm of Smart Cities

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ABSTRACT

Over the past decade, the dominant entrepreneurial form of urban governance has seriously hindered the transformation of cities by neglecting the role of urban contexts in shaping governance structures and outcomes. To promote alternatives, this article presents a sociotechnical framework for smart urban governance. This framework explicitly examines the impacts of urban contexts on the sociotechnical interaction between urban technological innovation and urban governance in the realm of smart cities. Three real-world cases were used to demonstrate how the framework can be applied in different urban contexts. The results show that the alleged smartness in smart urban governance by no means implies the simple acceptance, adoption, and use of technology; instead, it needs to be conditionate. For successful smart urban governance, urban technological innovation should be effectively attuned to the wider urban actors and preexisting urban challenges (i.e., the urban governance process), with a special focus on the urban context.

KEYWORDS

Smart City, Sociotechnical Approach, Transformation of Cities, Urban Governance, Urban Technological Innovation

INTRODUCTION

Over the past decade, the notion of “smart cities” has been proposed as a way to deal with dramatically increasing urban issues (housing, crime, air pollution, traffic congestion, etc.). However, according to several authors (e.g., Grossi and Pianezzi, 2017; Hollands, 2015; Shelton et al., 2015; Lee et al., 2013), the governance of smart cities is largely in conjunction with an entrepreneurial form of urban governance. In practice, the notion of smart city is promoted by local governments to attract global capital and boost local economic growth (Shwayri, 2013). Some of

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the most extensively elaborated examples of these initiatives—for example, Songdo Ubiquitous Eco-City (South Korea), Genoa Smart City (Italy), and Masdar (United Arab Emirates)—are places where large high-tech companies and real estate companies have dominated the planning, design, and construction of facilities and entities (Grossi and Pianezzi, 2017; Hollands, 2015; Kitchin, 2015; Shwayri, 2013). Consequently, the application of various electronic and digital technologies to cities is largely promoted by “the profit motive of global high-technology companies” (Hollands, 2015). High-tech companies typically emphasize that the adoption and implementation of new technologies will bring benefits to cities; however, this corporate vision of smartness has caused an emergence of “business-led technological solutionism” (Kitchin, 2014). In practice, various information and communication technologies (ICTs) are packaged and promoted by private sectors, whereas their substantive added value for augmenting urban operation and urban governance is far less considered.

Meijer (2016) claims that any successful smart city governance is closely related to our perception and use of technologies across the entire city. The idea is that the usefulness of technology for augmenting urban governance in the realm of smart cities can only be enhanced by studying the interaction between urban technological innovations and governance processes in specific urban contexts (Bolívar and Meijer, 2016; Meijer, 2016; Meijer and Bolívar, 2013). In this paper, urban technological innovation refers to the creation, diffusion, adoption, and utilization of new technologies. According to Cels et al. (2012), it is the social dimension that determines the meaning and function of technologies and makes them work. Hollands (2008) argues that the governance of smart cities should consider the input and contribution of various groups of people in the production of knowledge, techniques, and new technologies. It is argued that the opportunities only arise when technological solutions are developed and implemented in close collaboration with research institutes, businesses, and citizens (Chesbrough, 2006). So far, little attention has been paid to this connection. In fact, new technologies developed in smart cities have often been criticized for their negligence of the embedded governance processes (Capra, 2016; Shelton et al., 2015; Meijer and Bolívar, 2013).

The aim of the present research was to connect the two and investigate the extent to which urban technological innovations interact with urban governance in specific urban contexts and produce alternatives for the governance of smart cities. Special emphasis was put on the impacts of urban contexts on the sociotechnical interaction between urban technological innovations and urban governance. In this paper, these alternatives driven by technology interaction with urban governance are called “smart urban governance.” Thus, our attention shifted from a focus on the entrepreneurial form of urban governance, to a sociotechnical process of smart urban governance. Here, a sociotechnical method indicates that a system that is intended to be optimal should only be situated in a particular setting, and that the optimum is always the result of the sharing of the views and knowledge of people in a social process (Vonk and Ligtenberg, 2010). Thus, the usefulness of urban technological innovations in the realm of smart cities should only be integrated into an urban governance process, enabling participants or urban actors and the context specificities to determine its added value.

The following section discusses the scientific literature on urban technological innovation and urban governance in the realm of smart cities and shows how the two research areas can converge and offer new opportunities. The developed sociotechnical framework is then presented to illustrate how alternatives for the governance of smart cities (i.e., smart urban governance) can be produced. Section 3 explains the research methodology and steps. In Section 4, three real-world smart city projects are presented to account for the dynamics of technology interaction with urban governance and to reveal the resulting meanings of smart urban governance. In Section 5, the findings of the case analysis are presented. Section 6 presents the conclusion.

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