

Chapter 15

Community Mesh Networks: Citizens' Participation in the Deployment of Smart Cities

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ABSTRACT

Smart cities embed information and communication technologies (ICT) to create interactive milieus that constitute a bridge between the physical and the digital world. In their attempt to improve citizens' quality of life through a more efficient use and sustainability of resources, smart cities might, however, also raise important concerns as regards the privacy and confidentiality of personal data flows. Insofar as the design of a city's telecommunication infrastructure is likely to affect the nature of social dynamics and human interactions, it should, ideally, be achieved through a coordinated, citizen-centric approach combining integrated ICTs with active citizen participation and intelligent physical, digital and informational resource management. This chapter analyzes the case of community mesh networks as an example of grassroots decentralized communication infrastructures, whose architecture design has important implications for the deployment and configuration of smart cities.

INTRODUCTION

Smart cities aim to promote economic development, sustainability, efficiency and greater quality of life (QoL) by using modern digital assets and mobile communication technologies to provide new and innovative services directed towards fulfilling existing and emergent citizens' needs by encouraging participatory action and civil engagement (Caragliu et al., 2009). As such, the deployment of smart cities is a complicated task that involves many multi-faceted issues, comprising questions such as environmental and infrastructural design, community living, and individual mobility. Many different stakeholders are involved in the process of turning a city into a smart city, yet the ultimate beneficiary is (or should be) the citizen. Thus, in order to succeed, this process should, ideally, put citizens at the center of the analysis, considering them an agent rather than a mere target (Nam & Pardo, 2011).

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After providing a general overview of the traditional approach to smart city deployment, this chapter analyses the arguments behind the severe criticism which smart cities have recently been subject to. On the one hand, there is growing mistrust towards a purely technologically-driven approach to smart cities, which tend to be treated as an end *per se*, rather than as a means of providing better services and greater QoL for their citizens. Rather than looking at the consequences that technology might have on the social dynamics and perceived interests of people inhabiting the city, the focus is often excessively geared towards improving the technical infrastructure of the city, whose inhabitants are mainly treated as passive users rather than pro-active citizens (Humphries, 2013). On the other hand, the data-driven character of many smart cities – collecting personal information about citizens’ habits, lifestyles, and keeping track of their daily behaviors – raises important concerns as regards the privacy and confidentiality of personal data. To the extent that such data is collected, stored and processed by third party operators, citizens lose control over their own personal data, which may be used for secondary purposes without the consent of the data subject (Martinez-Balleste et al., 2013).

In this context, the first run of experiments with smart city deployment (for example, see the various initiatives in Tokyo, London, New York and Barcelona, Singapore’s Intelligent Transport System, Dubai’s Internet City project, and more recently, South Korea’s Ubiquitous-City project turning the city of Incheon into the world’s largest and most hi-tech smart city) has shown that a socially-oriented design for urban development is a critical requirement that could lead to dangerous outcomes if not properly implemented. Indeed, if the needs of citizens are not properly taken into account in the development of smart cities, the outcome is likely to be an environment that actually alienates citizens who do not recognize or understand (and sometimes simply do not agree with) the new value propositions that are being offered to them through the smart city infrastructure. Given the growing impact that technology is having on our everyday life, there is today a growing need to implement smart cities through a more grassroots, citizen-centric approach.

Emerging technologies may provide a solution to this need by facilitating the development of tools for promoting social inclusion and participation in the design of tomorrow’s smart cities. This chapter focuses specifically on the use of mesh networking technology as an example of grassroots decentralized communication infrastructures that might play an important role in the deployment of smart cities. The objective is to understand whether, and how, can citizens become active participants in improving their own city’s infrastructure, without giving up their individual autonomy or foregoing their rights to privacy and data protection. Ultimately, the success and long-term sustainability of smart cities might depend more on their ability to deploy new and innovative instruments for the empowerment of communities, rather than on the deployment of sophisticated technologies which are deployed and controlled by third party operators, and subsequently imposed in a top-down fashion to the city’s inhabitants, without giving them the opportunity to participate in the design and management of these technologies. If the goal is, ultimately, to improve the quality of citizens’ lives, it is not enough to supply more personalized and customized services. It is also important – if not essential – to provide citizens with new opportunities for social interactions within the urban environment, along with a higher degree of freedom and autonomy.

BACKGROUND

Smart cities embed information and communication technologies (ICT) to create interactive environments that constitute a bridge between the physical and the digital world. Technological advances are pushing

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