

## GUEST EDITORIAL PREFACE

# Smart Cities, Smart Governments and Smart Citizens: A Brief Introduction

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Although the field of study surrounding the “smart city” is in an embryonic phase, the use of information and communication technologies (ICT) in urban settings is not new (Dameri and Rosenthal-Sabroux, 2014; Toh and Low, 1993; Tokmakoff and Billington, 1994). Since ancient times, cities and metropolitan areas have propelled social transformation and economic prosperity in many societies (Katz and Bradley, 2013). Many modern urban sites and metros have leveraged the success and competitiveness of ICTs (Caragliu, Del Bo and Nijkamp, 2011). At least in part, the recent growth of smart city initiatives can be attributed to the rapid adoption of mobile and sensor technologies, as well as the diversity of available Internet applications (Nam and Pardo, 2011; Oberti and Pavesi, 2013).

The effective use of technological innovations in urban sites has been embraced by the emergent term “smart city”, with a strong focus on improving living conditions, safeguarding

the sustainability of the natural environment, and engaging with citizens more effectively and actively (Dameri and Rosenthal-Sabroux, 2014). Also known as smart city, digital city, or intelligent city, many of these initiatives have been introduced as strategies to improve the utilization of physical infrastructure (e.g., roads and utility grids), engage citizens in active local governance and decision making, foster sustainable growth, and help government officials learn and innovate as the environment changes.

In spite of the excitement surrounding the technological innovations of a smart city, this field is still in its early development. A few authors are in the process of defining and conceptualizing the smart city (Chourabi, H. et al., 2012; Cocchia, 2014; Hollands, 2008; Nam and Pardo, 2011); while others are exploring the implications of smart city initiatives in theory and in practice (Alwadhhi et al., 2012; Caragliu, Del Bo and Nijkamp, 2011; Nam and Pardo,

2011). Several studies are underway to define and conceptualize the smart city, but there are also case studies of smart city initiatives in action and a longer tradition of case studies of e-Government in urban or metropolitan settings (what could be called smart government) (Cocchia, 2014; Nam and Pardo, 2011). Studies have focused not only on the technological means and channels of city ICT initiatives, but also the impacts in terms of urban competitiveness, welfare, growth, education, health, transportation, communications, and the use of technology innovations to foster citizen participation and the governance of cities (Center on Governance, 2003; Giffinger et al., 2007).

Today, the smart city research field has grown in size and quality to form a more robust scientific community dedicated to studying a lengthy list of research categories, as identified by Dameri and Rosenthal-Sabroux (2014). These include emerging technological innovations for smart cities (e.g. big data, open data, social media & networks), decision-making tools for smart city projects, security and smart cities, knowledge management and smart cities, evaluation and performance measurement models for smart city projects, barriers and enabling conditions of smart city initiatives, critical success factors for smart city initiatives, assessment of the impact of smart city initiatives, smart cities and open innovations, e-participation and e-ruling in urban space, data infrastructure and integration for the smart city, and managing the smart city, among other emergent areas of research.

Smart city projects require collaborative efforts among governments and citizens to cope with the challenging and often competing demands for maintaining environmental sustainability, improving public services, accelerating economic growth and employment, and harmonizing multiple levels of authority, among other efforts to improve the quality of life of the city's inhabitants (Anthopoulos and Tsoukalas, 2005; Yovanof and Hazapis, 2009). To deal with these challenges, a holistic approach is necessary (Kanter and Litow, 2009; Lindskog, 2004; Nam and Pardo, 2011). At the

very least, the existing information and technology infrastructures need to be adequate for the rising demands for services and resources, and growing interdependencies among different systems (Giffinger et al., 2007; Hollands, 2008). To truly achieve their potential, smart city initiatives need to go beyond basic capabilities, allowing governments and citizens to use information and technology in innovative ways to improve not only the operational efficiencies and organization of public administrations, but also the quality of institutions and the quality of life within communities (Mauher and Smokvina, 2006; Odendaal, 2003).

The present special issue attempts to stimulate relevant theoretical, empirical, and technical discussions about smart cities and the governments and citizens that enable them. This special issue features a collection of four articles from the *15th International Conference on Digital Government Research (dg.o 2014)* dedicated to research that connects electronic government to the emergent topic of smart cities.

The first article written by Na Liu, Alex Ishiwata Gavino, and Sandeep Puroo and entitled "Extracting Citizen Values as Inputs for Designing Citizen-Responsive Urban e-Planning Services: The VOICE Approach and a Demonstration in the Healthcare Context" presents an interesting new approach to the design and development of services in the context of smart city projects. This new approach has the objective to develop services that adequately addresses citizens' values. The approach is a step toward improving service quality that needs future research in order to test, validate, and generalize the authors' initial findings. In general, this piece has the potential to become a method for services design and implementation that accounts for the values of different stakeholders across smart city initiatives.

Nili Steinfeld and Azi Lev-On's article "Well-Done, Mr. Mayor! Linguistic Analysis of Municipal Facebook Pages" focuses on analyzing local governance using the inputs from social media applications such as Facebook. In particular, the study analyzes the discourse between citizens and local administrators in

municipal governments by applying automated digital tools. This topic of citizen-government interaction represents an interesting direction for the field of smart cities and the use of computer-mediated tools to analyze social media data shows the promise of this type of methodology.

The third article, “Limits and Potential for e-Government and Smart Cities in Local Government: A Cluster Analysis Concerning ICT Infrastructure and Use” by Erico Przeybilovicz, Wesley Vieira da Silva, and Maria Alexandra Cunha, represents a useful contribution to the field of smart city and e-government literature through the creation of city typologies. The authors create profiles of local governments in the state of Paraná in Brazil that developed and applied smart city projects. The methodological tool applied in this study was cluster analysis, which focuses on identifying data patterns. The result was an analytical tool that groups towns together in relation to their technology infrastructure and their use of ICT. The article advances our understanding of the use of ICTs and investments in technology infrastructure within Brazilian local governments to develop into smart cities.

The fourth article, titled “Is Brazilian Open Government Data Actually Open Data? An Analysis of the Current Scenario”, is a collaborative effort from a group of Brazilian researchers: Kellyton dos Santos Brito, Marcos Antônio da Silva Costa, Vinicius Cardoso Garcia, and Silvio Romero de Lemos Meira. The article contributes to the field by evaluating the challenges of open data initiatives in the context of smart city initiatives, relying on data from two smart city initiatives in Brazil. The authors first applied factor analysis to evaluate open data initiatives and clarify the most critical components of smart city implementation in Brazilian municipalities, then conducted in-depth interviews with developers to understand the challenges of implementing these projects.

Each of these papers discusses different technical, managerial, governance, social, and policy issues to understand and evaluate

smart city initiatives. The text from Na Liu, Alex Ishiwata Gavino, and Sandeep Puroo is a model for developing technological tools for smart city initiatives from the basis of user needs and values. The piece from Nili Steinfeld and Azi Lev-On offers a window into the analytical opportunities to investigate data from social media tools, which governments currently use to facilitate government-citizen interaction, within the new context of smart cities. The last two articles from Brazilian researchers represent alternative methodological mechanisms to analyze smart city initiatives by using the statistical techniques of factor and cluster analysis, complemented by interviews.

These four studies are the start of future development in the study of smart cities in theoretical, practical, and policy domains. As these authors have made important contributions to state-of-the-art research in this field, researchers at future d.g.o conferences and other forums across the globe will certainly provide new insights with a greater level of breath and depth to help us understand the role and dynamics among smart cities, smart governments, and smart citizens. By the time this special issue is published, there will be new contributions to the field of smart cities that will hopefully fill the current knowledge gaps to meet the emerging needs in the nascent field of smart city research.

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