Smart Governance: Using a Literature Review and Empirical Analysis to Build a Research Model

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Abstract

The attention for Smart governance, a key aspect of Smart cities, is growing, but our conceptual understanding of it is still limited. This article fills this gap in our understanding by exploring the concept of Smart governance both theoretically and empirically and developing a research model of Smart governance. On the basis of a systematic review of the literature defining elements, aspired outcomes and implementation strategies are identified as key dimensions of Smart governance. Inductively, we identify various categories within these variables. The key dimensions were presented to a sample of representatives of European local governments to investigate the dominant perceptions of practitioners and to refine the categories. Our study results in a model for research into the implementation strategies, Smart governance arrangements, and outcomes of Smart governance.

Keywords

Smart governance, research model, literature review, empirical analysis

Introduction

Cities face the enormous challenge of ensuring prosperity, sustainability, social inclusion, public health, and safety (Barber, 2013; Landry, 2006). Especially, in times of financial crisis, traditional approaches fall short and innovative solutions to tackle these challenges are needed. For this reason, the idea of transforming cities into "Smart cities" has gained much popularity among urban politicians and professionals around the world (Giffinger, Fertner, Kramar, Meijers, & Pichler-Milanović, 2007; Tranos & Gertner, 2012).

Prior research has focused mainly on business-led urban development, on the social inclusion agenda (Caragliu, Del Bo, & Nijkamp, 2009; Kourtit, Nijkamp, & Arribas, 2012), on the role of

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creative industries in urban growth (Hoon Lee, Phaal, & Lee, 2013; Lombardi, Giordano, Farouh, & Yousef, 2012; Shapiro, 2006), on the importance of social capital in urban development, and on the urban sustainability (Caragliu et al., 2009). The fact that the use of information technology helps governments to improve political participation, implement public policies, or provide public sector services has received far less attention. Hollands (2008) has recognized this and highlights the need for technologies to be smarter is not just in the way they make it possible for cities to be intelligent (as an institutional agent) in generating capital and creating wealth, but in the ways they operate their governments. In fact, using the triple-helix model proposed by Leydesdorff and Deakin (2011), it can be recognized that urban development is not a spontaneous product of market economics but a product of the policies that need to be carefully constructed by a governing authority.

The growing role of technologies in the functioning of urban systems is making governments rethink the role they must have in a knowledge-based society. This role has been referred to as "Smart governance" in prior research (Giffinger et al., 2007). In spite of its importance, there is no general agreement on the definition of this concept. While some prior research has put emphasis on political participation as well as the functioning of the administration (Giffinger et al., 2007), others have focused on the process of collecting all sort of data and information concerning public management by sensor or sensor networks (Schuurman, Baccarne, De Marez, & Mechant, 2012) or on the achievement of the social inclusion of urban residents in public services (Caragliu et al., 2009).

The purpose of this study is to inductively develop a model of Smart governance through a systematic review of the literature and a survey among smart city practitioners. Strong conceptualizations of new phenomena have two features: They build on broader theoretical notions and they catch all the relevant empirical aspects of the new phenomena (cf. Flyvbjerg, 2001). This means that a rough framework can be developed on the basis of a study of the existing literature, but the specific value needs to be tested through empirical research. The empirical findings can be used to enrich the theoretical conceptualization and adjust it to make it useful for building a research model. For this reason, the following three questions have been formulated to guide our research:

1. *How is Smart governance conceptualized in the literature?* This exploration will not result in one definition but rather in a systematic overview of the different components of Smart governance. We will analyze the literature on Smart cities to identify defining elements, aspired outcomes, and implementation strategies of Smart governance.
2. *How do smart city practitioners conceptualize Smart governance?* The different dimensions of Smart governance are presented to representatives of European local governments with an interest in Smart cities to measure what they see as key elements of Smart governance.
3. *How can we use the conceptualizations in the literature and among practitioners to develop a research model for Smart governance*? The conceptual elements from both explorations will be combined to develop a revised model that can form the basis for empirical research into Smart governance.

The overall aim of this theoretical and empirical article is to provide a basis for academic research into Smart governance. Further research into the role of governance in smart city development requires a firm conceptual understanding of the various dimensions of this concept. This article contributes to the literature by providing a systematic model of Smart governance. As such, it provides a basis for empirical research into the relation between forms of smart city governance.

Research Design and Method

In order to answer the research questions of this paper, a systematic review of the literature and a survey among smart city practitioners have been conducted.

The literature review consisted of a three phases. In the first phase, in order to analyze the concept of Smart governance in the literature, an advance search query was performed on ISI Web of Knowledge, ScienceDirect, Scopus EBSCO Host (Business Source, Library, Information Science & Technology Abstracts, SocINDEX with Full Text and ebook Collection), and ABI/ INFORM (ProQuest) databases. These databases are widely used in order to undertake sciento-metrics analysis (Andersen & Hammarfelt, 2011; Jacso, 2013; Murad & Tomov, 2012; Pickett, 2013). In each one of the database, the word ''smart city'' and ''Smart governance'' were searched in all fields in order to retrieve the greater number of related articles and other outlets, such as proceeding papers, books, book chapters or doctoral theses. It became apparent that articles on Smart cities and Smart governance have been published in a variety of journals and that no journal has dedicated itself to these subjects. The search query entered in ISI Web of Knowledge, ScienceDirect, Scopus EBSCO Host and ABI/INFORM (ProQuest) databases let us to obtain, respectively, a total of 171, 226, 128, and 212 outlets on Smart cities and Smart governance, and it covered all papers published up to December 2014.

In the second phase, all the papers from the broad literature search were analyzed for their relevance for conceptualizing Smart governance. The papers of specific technical nature without examining the operationalized concepts were eliminated from the sample. These papers analyze or propose technologies for governance but present no information on what Smart governance entails. In addition, double counting of papers was avoided by counting only the papers that were different across the databases. These processes let us to obtain a first valid sample of 80 papers.

The third phase consisted of a thorough reading of the papers selected in the second phase to select only the papers that were relevant to our research question. The 57 papers that used the conceptualization of Smart governance from other papers did not make a new contribution on the operationalized concepts, and the 8 papers that did not provide a working definition were removed from the sample. As a result, we obtained a final corpus composed of 15 papers published in international journals, books, proceedings, or research studies with different operationalized concepts of Smart governance (see Table 1).

To determine these operational concepts of Smart governance, we initially based on the perspectives of smart city governance identified by Meijer and Rodríguez (2013). We also carried out an exploratory content analysis of each of the articles in the sample to widen these operational attributes (Krippendorff, 1980). During this phase of the study, we developed categories for these different dimensions inductively and applied these categories to the set of publications. In this encoding phase, the researchers checked these categories to decide the labels to be assigned and the topics to be included (see Tables 1 and 2). Subsequently, each of the articles incorporated in the study sample was encoded separately (Lan & Anders, 2000) and was analyzed for variation and similarities per domain to map the conceptual fragmentation of approaches to smart city governance. Any disagreements concerning the definition of the categories to be analyzed were discussed and resolved.

An explorative reading of these papers let us to identify the following three dimensions as key to the concept of Smart governance: (1) the defining elements of Smart governance, (2) the aspired outcomes, and (3) the implementation strategies. We subsequently analyzed all paper on these three dimensions. The aim of the analysis was to generate a broad understanding of the variation in conceptions of Smart governance rather than identifying the dominant conceptualization.

Regarding the survey methodology, we aimed to develop the concept of Smart governance further by exploring the perceptions of urban practitioners with an interest in Smart cities. The values for the three dimensions that we had identified in the literature review formed the starting point, but we also asked the practitioners to present their own definitions.

The survey targeted all representatives of local governments that are members of the EUROCI-TIES network. EUROCITIES is the network of the elected local and municipal governments of major European cities and bring together the local governments of over 130 of Europe's largest cities

Table 1. Characterization of smart governance Concept in Prior Research.

Author	Definition (Objects)	Based on ICT	Based on External Collaboration and Participation	Based on Internal Coordination	Based on Decision-Making Processes	Based on e-Administration	Based on the Outcomes
(Giffinger et al., 2007, p. 11)	Smart governance comprises aspects of political participation, services for citizens as well as the functioning of the administration		—			—	
(Nam, 2012, p. 193)	Smart governance is the promotion of smart city initiatives					—	
(UNESCAP, 2007; Walravens, 2012, p. 125)	Smart governance is the process of decision-making and the process by which decisions are implemented (or not implemented) using the network technologies				—		
(Schuurman, Baccarne, De Marez, & Mechant, 2012, p. 51)	Smart governance is the process of collecting all sort of data and information concerning public management by sensor or sensor networks	—					
(Bătăgan, 2011, p. 85)	Smart governance means collaborating across departments and with communities, helping to promote economic growth and at the most important level making operations and services truly citizen-centric		—	—			
(Batty et al., 2012, p. 497)	Smart governance is a much stronger intelligence function for coordinating the many different components that comprise the smart city. It is a structure that brings together traditional functions of government and business			—			—

Table 1. (continued)

Author	Definition (Objects)	Attributes of Smart Governance Systems					
		Based on ICT	Based on External Collaboration and Participation	Based on Internal Coordination	Based on Decision-Making Processes	Based on e-Administration	Based on the Outcomes
(Batty et al., 2012, p. 505)	Smart governance is only an attribute that is associated to a governmental management of a city whenever the city is badging itself as smart					—	
(Giffinger et al., 2007, p. 10; Giuffrè, Marco Siniscalchia, & Tesorierea, 2012, p. 16)	Good governance or smart governance is often referred to as the use of new channels of communication for the citizens, e.g. "e-governance" or "e-democracy"	—				—	
(Caragliu, Del Bo, & Nijkamp, 2009, p. 48)	The overall aim of Smart Governance could be to achieve the social inclusion of urban residents in public services						—
(Kourtit, Nijkamp, & Arribas, 2012, p. 232)	Smart governance is the pro-active and open-minded governance structures, with all actors involved, in order to maximize the socio-economic and ecological performance of cities, and to cope with negative externalities and historically grown path dependencies		—				—
(Tapscott & Agnew, 1999, p. 37)	Smart governance is a widespread adoption of a more community-based model of governance with greater connectivity being facilitated by new technologies	—	—				

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Table 1. (continued)

Author	Definition (Objects)	Attributes of Smart Governance Systems					
		Based on ICT	Based on External Collaboration and Participation	Based on Internal Coordination	Based on Decision-Making Processes	Based on e-Administration	Based on the Outcomes
(Barrionuevo, Berrone, & Ricart, 2012, p. 52)	Smart cities need to develop smart governance systems that take all key factors into account. A three step process is proposed, beginning by diagnosing the situation, then developing a strategic plan and finally taking action				—	—	
(Willke, 2007, p. 165)	Smart governance is (. . .) the ensemble of principles, factors and capacities that constitute a form of governance able to cope with the conditions and exigencies of the knowledge society			—	—	—	
(Willke, 2007, p. 10)	Smart governance is the activity of coordinating communications in order to achieve collective goals through collaboration		—	—			
(Odendaal, 2003, p. 586)	E-governance refers to the ability of government agencies to interact with the public on-line in the delivery of services and in fulfilling their pre-designated mandates					—	
(Gil-García, 2012, p. 274)	Smart State is a new form of electronic governance that use sophisticated information technologies to interconnect and integrate information, processes, institutions, and physical infrastructure to better serve citizens and communities	—		—			

Note. Adapted from own elaboration.

Table 2. Identification of Dimensions of smart governance in the Literature.

Component	Categories	Values
Defining elements of smart governance	Use of technology	Smart use of ICTs
	Organizational processes	Smart collaboration and participation
		Smart internal coordination
		Smart decision-making
		Smart administration
	Outcomes	Smart outcomes
Aspired outcomes of smart governance	First-order outcomes: changes to the government organization	Efficient government
		Readiness for disaster management
	Second-order outcomes: changes in the position of government vis-à-vis other urban actors	Citizen-centric services
		Interaction with citizens
		Strong city brand
	Third-order outcomes: improvements to the city	Economic growth
		Social inclusion
		Ecological performance
		Highly educated citizens
Implementation strategies for smart governance	Ideas	Vision
	Actions	Legislation
		Policies
		Use of ICTs
		Collaboration

Note. Adapted from own elaboration.

and 40 partner cities, which between them govern 130 million citizens across 35 countries. The EUROCITIES network acts as either coordinator or partner in a range of European Union (EU)-funded projects that touch upon the policy areas it focuses on and involve its members. In this regard, the great challenge for the EUROCITIES network nowadays is the translation of Smart cities into the broad political area (EUROCITIES, 2011). In addition, members of the EUROCITIES network are actually involved in two EU projects focused on Smart cities[1] and in a forum and a working group that have been created into the network (see http://www.eurocities.eu/eurocities/activities/working_groups/Smart-Cities&tpl=home).

We designed a questionnaire with the aim of collecting the perception of the representatives of local governments that are members of the EUROCITIES network about this concept (see Appendix). As operationalized in this study, this consists of (1) the elements of Smart governance definition, (2) what outcomes they think that Smart governance can produce, and (3) what strategies are needed to realize Smart governance. In addition, participants were encouraged to express their definition of Smart governance in an open-ended question.

The questionnaire was translated into different languages and distributed to members of the EUROCITIES network. The survey instrument was administered through a follow-up online questionnaire. In this regard, a web link to the questionnaire was sent out to our sample selection, and an e-mail was provided to ask for doubts about the questionnaire. The questionnaire was sent to 70 leading Smart cities in Europe in order to achieve the aim of our research. Sixty-four responses were received (91.42% of sample Smart cities).

Sample urban practitioners were asked to describe their degree of agreement with each statement on a 5-point Likert-type scale (ranging from *not at all important* "−2" to *extremely important* "2"). Although the Likert-type scale has some limitations (Hodge & Gillespie, 2003; Orvik, 1972; Russell

& Bobko, 1992), the measures of Likert-type scales are simple to administer, quantify, and code (Spector, 1992), and the results obtained have proven to be reliable and valid (Li, 2013; Matell & Jacoby, 1971). In addition, Likert-type scale allows obtaining numerical measurement results directly used for statistical inference and has been proved to be "robust" when this scale is used for parametric statistics (Norman, 2010).

In addition, due to the perception of the differences between adjacent levels in Likert-type scales (Bertram, 2007), the mean is not the best measure to be used to comparing results between questions due to scale problems. In this milieu, the analysis of the central tendency summarized by median and the mode of the responses has been proved to be useful in order to analyze data obtained using Likert-type scale (Bertram, 2007). In order to understand the results in our article, high median scores (those close to 2 points) mean that sample urban practitioners agree with the statement included in the questionnaire.

Once the answers to the survey were received, data were compiled to find whether differences between theoretical and social shared constructions of the Smart governance concept exist. As Parthemore and Morse (2010) indicate, the concepts can be used systematically across many contexts of application. In addition, they are, like other representations, discrete (they can be distinguished from one another) and generally if not always simplified from what they are representing (Parthemore & Morse, 2010).

Analysis of Reviewing the Literature on Smart Governance

Defining Elements of Smart Governance

This first dimension presents answers to the question: When do we call government action Smart governance? Some authors presented explicit definitions but most referred implicitly to different defining elements. Some authors did not explicitly write about Smart governance but, in the context of work on Smart cities, they referred to electronic governance or even governance in general. Six defining elements were identified that cover the various aspects of governance and highlight how they are key to Smart governance:

- The first defining element we identified is *the use of Information and Communication Technologies (ICTs)*. Giffinger, Fertner, Kramar, Meijers, and Pichler-Milanović (2007, p. 10), for example, refer to Smart governance as the use of new channels of communication for the citizens, for example, "e-governance" or "e-democracy."
- The second defining element is *external collaboration and participation*. Bătăgan (2011, p. 85), for example, provides the following definition: "Smart governance means collaborating across departments and with communities, helping to promote economic growth and at the most important level making operations and services truly citizen-centric."
- The third defining element is *internal coordination*. A clear example is Willke's (2007, p. 10) conceptualization of governance as "the activity of coordinating communications in order to achieve collective goals through collaboration."
- The fourth defining element of Smart governance is the *decision-making process*. Barrionuevo, Berrone, and Ricart (2012, p. 52), for example, highlight that Smart cities need to develop Smart governance systems that take all key factors into account. A three-step process is proposed, beginning by diagnosing the situation, then developing a strategic plan, and finally taking action.
- The fifth defining element is *e-administration*. Odendaal (2003, p. 586) stresses that Smart governance refers to the ability of government agencies to interact with the public online in the delivery of services and in fulfilling their predesignated mandates.

- The sixth and final defining element is *outcomes*. Caragliu, Del Bo, and Nijkamp (2009, p. 48), for example, stress that the overall aim of Smart governance could be to achieve the social inclusion of urban residents in public services.

Most papers presented a combination of various defining elements. An overview of the various definitions and the defining elements that they contain is presented in Table 1. This overview highlights the variation in concepts of Smart governance and indicates that the variation can be mapped fairly well on the basis of these six defining elements. These six defining elements can be categorized into three groups: (1) the use of a technology (smart ICT); (2) organizational processes (smart collaboration and participation, smart internal administration, smart decision making, and smart administration); and (3) aspired outcomes (smart outcomes).

Aspired Outcomes of Smart Governance

The second dimension presents answers to the question: What does Smart governance aim to achieve? The aspired outcomes are conceptualized as something that is produced as a result or consequence of the implementation of Smart governance into a smart city. We analyzed the literature for the aspired outcomes of Smart governance, and this qualitative analysis let us to identify the following nine aspired outcomes:

- First, some authors highlight the effect of Smart governance on the *economic performance* of cities. Kourtit, Nijkamp, and Arribas (2012, p. 232) and Bătăgan (2011, p. 85), for example, indicate that Smart governance helps to promote economic growth performance of cities due to the expected improved efficiency of public sector services in Smart cities.
- Second, some authors identified *citizen-centric services* as a key ambition of Smart governance. Bătăgan (2011, p. 85), for example, indicates that Smart governance means collaborating across departments and with communities to make services truly citizen centric. Also, Giffinger et al. (2007, p. 11) focus their comments regarding Smart governance systems on services for citizens and the functioning of the administration.
- Third, *social exclusion* is almost entirely an urban problem (Power, 1999, p. 1) and has lead governments to come under pressure to develop policies for offering equal access to the benefits of rising standards of living (Deakin, 2012, p. 117). These policies have been undertaken under the heading of "Smart governance" with the aim of achieving of the social inclusion of urban residents in public services (Caragliu et al., 2009, p. 48).
- Fourth, *ecological performance* is another expected outcome derived from Smart governance (Kourtit et al., 2012, p. 232). In this regard, Bătăgan (2011, p. 83) points out that "the smart system represents a real support for an urban development, which will generate a sustainable development of our cities."
- Fifth, some authors indicate that "e-governance refers to the ability of government agencies to *interact with the public* online in the delivery of services and in fulfilling their predesignated mandates" (Odendaal, 2003, p. 586). Indeed, Smart governance is often referred to as the use of new channels for "e-democracy" (Giffinger et al., 2007, p. 10; Giuffrè, Marco Siniscalchia, & Tesorierea, 2012, p. 16).
- Sixth, some authors indicate that *city branding* is a main outcome sought of Smart governance. In this regard, Batty et al. (2012, p. 505) point out that the concept "Smart governance" is only a label "associated to a governmental management of a city whenever the city is badging itself as smart." Giffinger and Gufrun (2010, pp. 7–8) indicate that "local governments only aim to gain a better position in city rankings neglecting its purpose and effectiveness for strategic planning." Therefore, boosting the city's image is another expected outcome of Smart governance.

- Seventh, a key ambition of Smart governance is making better use of available resources: *efficient government* (Batty et al., 2012, p. 482). Smart governance systems help to organize and deliver services in a much more efficient way (Batty et al., 2012, p. 482). So authors indicate that Smart governance has positive effects on the functioning of the administration (Giffinger et al., 2007, p. 11).
- Eighth, Smart governance aims to boost the number of *highly educated citizens* in cities. Smart cities aim to become centers of higher education (Winters, 2011, p. 255). Indeed, persons moving to pursue higher education are hypothesized to play an important role in the growth of Smart cities, and therefore Smart governance aims to strengthen this process (Winters, 2011, p. 268).
- Ninth, a final expected outcome is the *readiness for disaster management*. Smart systems must provide services anywhere and anytime. In disaster management, cities need quick response to emergency situations as well as balanced risk management (Alkandari, Alnasheet, & Alshekhly, 2012, p. 84).

In brief, the overview shows a variation in outcomes. These outcomes can be categorized into (1) first-order outcomes or changes to the government organization (efficient government and readiness for disaster management); (2) second-order outcomes or changes in the position of government vis-à-vis other urban actors (citizen-centric services, interactions with citizens, and strong citizen brand); and (3) third-order outcomes or improvements to the city (economic growth, social inclusion, ecological performance, and highly educated citizens).

Implementation Strategies for Realizing Smart Governance

The third dimension provides answers to the question: How can a city realize Smart governance? To realize a comprehensive conceptualization of Smart governance, we identified the different implementation strategies for realizing Smart governance. On the basis of our analysis of the literature, we identified the following implementation strategies:

- *Legislation* is a key aspect for Smart cities. In this regard, "what is required not only for cities but for government and governance at every level are new frameworks that take account of the extensive access to information that contemporary citizenship now makes possible" (Batty et al., 2012, pp. 511–512). In Smart cities, "ICT will be central but so will issues of responsibility, openness, transparency, access to public data and the regulations that extra national government agencies may impose on what and how and where and why citizens are able to influence the governance of their cities" (Batty et al., 2012, p. 512).
- *Policies* for promoting smart city initiatives and projects are seen as crucial to smart city implementation. Some authors indicate that Smart governance is the promotion of smart city initiatives (Nam, 2012, p. 193). Government in Smart cities must promote policies oriented toward strengthening innovation systems, specially focused on knowledge that might be more basic, fundamental (Yigitcanlar, Velibeyoglu, & Martinez-Fernandez, 2008, p. 17), and on cultural development, which need to be carefully constructed by a governing authority (Leydesdorff & Deakin, 2011, p. 60).
- Various authors emphasize *the use of ICTs* for urban governance. According to Batty et al. (2012, p. 513), the first major shift in the context of Smart cities is the development of information infrastructure that underpins the city through distributed computing and networks available to everyone with devices that can access such infrastructure. The fact that such infrastructure is now available requires coordination so that services can be delivered most effectively (Batty et al., 2012, p. 513). Under this framework, the government plays a dual

role in driving the Smart cities. On one hand, municipal governments have to undertake trans-formation projects of city services (AMETIC, 2013, p. 85), which must operate in reaching certain policy goals (the implementation process) and organizational goals (decision making; Walravens, 2012, p. 125). To achieve these aims, Smart governance systems must allow the collection of all sorts of data and information concerning public management by sensor or sensor networks (based on Schuurman et al., 2012, p. 51). On the other hand, governments also have to support the development of technologies and models of services in the Smart City (AMETIC, 2013, p. 85).

- An *integral vision for a smart city* is seen as crucial to its proper realization. Prior research indicates that Smart governance is a much stronger intelligence function for coordinating the many different components that comprise the smart city. Smart governance is the ensemble of principles, factors, and capacities that constitute a form of governance able to cope with the conditions and exigencies of the knowledge society (Willke, 2007, p. 165). In fact, "it is a structure that brings together traditional functions of government and business" (Batty et al., 2012, p. 497). In Smart governance systems, government remains a mechanism for col-lective action, but often, as "a convener and enabler rather than the first mover of civic action" (Linders, 2012, p. 451).
- The final aspect of implementation is *collaborative governance*. Smart cities need smart sys-tems to improve the collaboration across departments and with communities. "Smart govern-ance is a widespread adoption of a more community-based model of governance with greater connectivity being facilitated by new technologies" (Tapscott & Agnew, 1999, p. 37). There-fore, Smart governance is the activity of coordinating communications in order to achieve collective goals through collaboration (Willke, 2007, p. 10).

This overview highlights two main aspects of implementation strategies for realizing Smart gov-ernance: ideas and actions. An integral vision of the city is the guiding idea, and this is translated in legal, technological, policy and collaborative actions. According to the publications in our sample, implementation this requires actions in different but interrelated domains guided by an overarching perspective on Smart governance.

A preliminary Model of Smart Governance

The first question we set out to answer was: How is Smart governance conceptualized in the liter-ature? On the basis of an explorative reading of the literature we identified (1) defining elements, (2) aspired outcomes, and (3) implementation strategies as the three dimensions of the concept of Smart governance. The values for these three dimensions were analyzed for the corpus of 15 publications. On the basis of our systematic literature review, we have developed the following preliminary con-cept of Smart governance (see Table 2):

The three dimensions serve to show the variety in concepts and help to map this variety. Our inductive analysis has resulted in the identification of categories within each dimension, and these categories contain different values. A problem with these three dimensions is that they are not independent:

- The outcomes form one of the defining elements but they are also the second dimension.
- The use of ICTs and collaboration are identified as both defining elements and implementa-tion strategies.

These problems will be solved in the revised model that we will develop in the fourth section. We will, however, first explore the match between theoretical concepts and the concepts of urban practitioners.

The Concept of Smart Governance: Perceptions of Practitioners

Perceptions of Smart Governance

The findings of our research are summarized in Table 3. We will discuss the three dimensions of the concept of Smart governance.

Defining elements of Smart governance. The table shows that most respondents think that the Smart governance is based on external collaboration and participation, the decision-making processes, and internal coordination (all mean scores 1.6 and median 2). Smart ICT scores somewhat lower (mean score 1.4 and median 2), smart administration considerably lower (mean score 1.3 and median 1), and smart outcomes very low (mean score 0.2 and median 1).

Hence, the respondents emphasize that Smart governance is predominantly about what we have labeled as the organizational processes. The three of the values connected with this category score highest, and only smart administration receives a lower score. It is interesting to note that the opinions about smart administration vary most with an *SD* of 0.8. The emphasis on the organizational processes underlines that the respondents view Smart governance as a *social change* rather than a technological change.

Still, the respondents assign considerable importance to the use of ICTs for characterizing Smart governance. Technological change may not be as important as social change, but many respondents still consider it to be a vital element of Smart cities.

The respondents share our analytical conclusion that outcomes are important but should not be considered as an element of the definition of Smart cities. We will discuss the desirable outcomes subsequently, and we'll see that the respondents certainly find these important. However, the answers here confirm that smart outcomes do not form an element in the definition of Smart governance. To check these findings, we also analyzed the definitions that the respondents had formulated themselves. These findings are presented in Table 4.

These answers confirm the emphasis on external collaboration and participation but also challenge some of the findings on the basis of the closed question. The smart administration now scores third and smart decision making and smart internal processes score lower. Smart ICT scores second in this list, and this indicates that the respondents do attach considerable relevance to technology. Smart outcomes scores high as well and this shows that, when asked to present their own definitions, the outcomes are indeed often mentioned.

The most important finding on the basis of this open question was that innovation is identified as a new defining element. This element was not identified on the basis of our analysis of the literature. Innovation is often mentioned in relation to Smart cities but not as a defining element of Smart governance. The representatives of European local governments differ in this respect with academics and do mention innovation as a defining element.

Aspired Outcomes of Smart Governance

Several outcomes, economic growth (1.7), citizen-centric services (1.7), more efficient government (1.6), and interaction with citizens (1.6), score fairly high. These are values from first-order outcomes or changes to government (more efficient government), second-order outcomes or changes in the position of government vis-à-vis other urban actors (citizen-centric services and interaction with citizens), and third-order outcomes or improvements to the city (economic growth). This underlines the idea that Smart governance aspires to realize outcomes at these three levels. One can observe that the second-order outcomes—changes in the position of government vis-à-vis other urban actors—have two answers in this top list and seem to be regarded as most important.

Table 3. Descriptive Statistics Of The Empirical Results.

Question	Mean	Median	SD
Q1. Smart governance is governance based on . . .			
. . . smart ICT	1,4688	2	0,689346366
. . . smart external collaboration and participation.	1,5781	2	0,685558225
. . . smart internal coordination.	1,5625	2	0,587569651
. . . smart decision-making processes.	1,6406	2	0,515388203
. . . smart e-administration.	1,2813	1	0,825558974
. . . smart outcomes.	0,1518	1	0,528875642
Q2. The main outcome that smart governance is to achieve is . . .			
. . . economic growth.	1,6875	2	0,530797543
. . . citizen-centric services.	1,7188	2	0,486932413
. . . social inclusion.	1,4375	2	0,687184271
. . . ecological performance.	1,4844	2	0,689885831
. . . interaction with citizens.	1,6094	2	0,632886747
. . . strong city brand	1,1094	1	0,779034557
. . . more efficient government	1,6406	2	0,651425482
. . . highly educated citizens	1,2500	1	0,734630887
. . . readiness for disaster management	0,8750	1	0,967733402
Q3. How important are the following strategies for realizing a smart city?			
Legislation for stimulating smart city	0,9688	1	0,991531603
Policies for promoting smart city initiatives and projects	1,6094	2	0,632886747
Use of ICTs to strengthen smart cities	1,5156	2	0,563216035
An integral vision for a smart city	1,7188	2	0,548265664
Collaborative governance for a smart city	1,7500	2	0,534522484

Note. Adapted from own elaboration. The 5-point Likert-type scale has been scored as follows: *Not at all important* (−2 points), *Low importance* (−1 point), *Neutral* (0 point), *Moderately important* (1 point), and *Extremely important* (2 points). N = 64.

Table 4. Defining Elements in Definitions Formulated by Respondents.

Defining element	n
. . . smart ICT	19
. . . smart external collaboration and participation	35
. . . smart internal coordination	9
. . . smart decision-making processes	10
. . . smart e-administration	15
. . . smart outcomes	14
. . . innovation	9
No element mentioned	3

Note. Adapted from own elaboration. N = 64.

Readiness for disaster management scores lowest. This is not surprising as this element is only mentioned in specific publications and seems to be a niche issue. In specific conditions, for example, when it comes to the earthquakes in New Zealand or Japan, this outcome may be crucial, but in most cities, it scores much lower than economy, ecological performance, and social inclusion.

Another outcome that also scores rather low is the strong city brand (1.1). The respondents value substantial outcomes such as citizen-centric services and economic growth higher than this more symbolic one. At the same time, there may be a social desirability bias here: Respondents may strive for a stronger city brand, but they will indicate that the objective outcomes such as a better connected

government and more sustainability are what aim for, since this is what they think the outside world expects from them.

The final element that we would like to discuss is educated citizens. This element is often mentioned in the literature (for an overview: Meijer & Rodríguez Bolívar, 2013), but it is given less importance by the respondents than other outcomes (1.25). This may indicate that smart citizens are seen as a different discourse—the creative class discourse (Florida, 2002)—which is separate from the smart city discourse.

Implementation Strategies for Smart Governance

In the answers to our questions about implementation strategies, we found that most of the strategies we had distinguished score quite high. The highest scoring implementation strategy is collaborative governance (1.75), but this one is closely followed by vision (1.72), policies (1.61), and use of ICTs (1.52). This confirms the idea that cities cannot choose one implementation strategy but need to apply all these elements to be successful.

The empirical research indicates that the legislation is not a key strategy to promoting Smart cities development. In this regard, it seems clear that Smart cities are frameworks in which smart initiatives are implemented, but they are not necessary built on legal rules. Surprisingly, there seems to be little attention for the legal questions concerning privacy that are bound to play a role in Smart governance and that are currently already the topic of public debate.

Confirmation, Patterns, and Small Addition to the Model of Smart Governance

This section presented the findings from a survey about the meaning of Smart governance among the representatives of European local governments. On the basis of these findings, we can now answer the second research question: How do smart city practitioners conceptualize Smart governance?

By and large the conceptualizations of practitioners are in line with the conceptualizations in the literature. The three dimensions—defining elements, aspired outcomes, and implementation strategies—were all recognized and received fairly high scores. This general finding confirms the relevance of the preliminary model that we developed on the basis of the literature.

The findings also provided some insights into what practitioners see as key elements. The empirical findings show that the main attributes in the Smart governance were the external participation and collaboration, smart decision-making processes, and internal coordination. Technology scored lower, but then it was a bit more prominent in the open definitions provided by the respondents. In addition to the literature, an important finding was that innovation was identified as an element of the concept of Smart governance.

The overview of aspired outcomes confirmed the idea of first-, second-, and third-order outcomes of Smart governance. As aspired outcomes produced by the Smart governance systems, our findings seem to indicate that the main one is an efficient public administration, focusing their opinion on the e-administration, understood as the need of more efficient government and citizen-centric services. These outcomes could promote the economic growth of the city, a more participatory government, and a citizenry increasingly aware of the need of environmental protection.

As for the implementation strategies to be used in the Smart governance system, our findings indicate that respondents think that the most strategic elements—a policy, a vision, use of ICTs, and collaboration—are needed for a successful implementation of Smart governance. By contrast, informal collaboration also seems to be accepted by the respondents because the legal framework is not relevant for them.
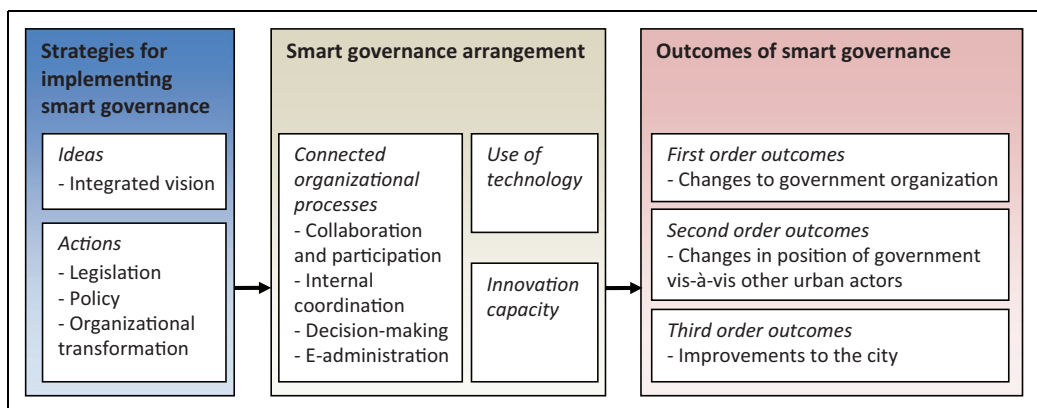
A Model of Smart Governance

The results of the theoretical and empirical explorations have been presented and analyzed. On the basis of these results, we can now revise the preliminary model of Smart governance and answer the third research question: How can we use the conceptualizations in the literature and among practitioners to develop a model for Smart governance? To develop this model of Smart governance, we need to do two things: (1) eliminate the observed overlap in the dimensions from the literature review and (2) bring in the new elements that we identified in the empirical research.

To eliminate the overlap, we take the smart outcomes from the defining elements of Smart governance. Presenting the outcomes as a defining element generates problems for empirical research, since it conceptualizes the dependent variable (outcomes) as an aspect of the independent variable (Smart governance). This is a frequent problem in the literature: Stating the desirable outcomes in the definition of a concept makes it attractive for practitioners but reduces its value for empirical research. For this reason, it is not surprising that this element scored rather low in the empirical survey.

A second overlap in the theoretical model concerned the fact that use of ICT and collaboration were regarded as both key elements of Smart governance and also implementation strategies. This, again, often happens with concepts in social science: The strategies for realizing something is confused with the actual phenomenon. To reduce this overlap, we chose to see use of technology as an element of Smart governance and collaboration as well (in the category organizational processes). We added the category ''organizational action'' to the implementation strategies to stress the relevance of the actions that are needed to *transform* the organization toward forms of Smart governance.

The empirical research mostly confirmed the relevance of the dimensions, categories, and values in the literature. It provided interesting insights into the prominence of certain values. It addition, one extra defining element of Smart governance was identified: innovation. This element is often mentioned in the literature on Smart cities but was not highlighted as a constitutive element of Smart governance in the literature. The fact that it was frequently mentioned by practitioners prompted us to add this element to the definition of Smart governance.

On the basis of our theoretical and empirical exploration we have now developed the following model of Smart governance (Figure 1).

Figure 1. A model of smart governance. Adapted from own elaboration.

This model can be used for the following types of research:

- *Identifying Smart governance configurations*. The definition of Smart governance as organizational processes, use of technology, and innovation provides a basis for the empirical study of different forms of Smart governance varying along these three categories. The configurations serve to map the variation in approaches to Smart governance in different cities. This variation forms the basis for understanding the different outcomes and impact of Smart governance.
- *Analyzing the impact of Smart governance*. The impacts of Smart governance configurations can be analyzed by studying the first-, second-, and third-generation outcomes. Smart governance configurations are the explanans that (partly) explain changes in the efficiency of government, readiness for disaster management, interaction with citizens, level of citizen-centricness of services, strength of the city brand, economic growth, social inclusion, ecological performance, and level of education of citizens.
- *Explaining differences in configurations*. The ideas about Smart governance and the actions (legislation, policy, and organizational transformation) can explain why certain smart governance configurations come about. Smart governance configurations are the explanandum, and ideas and actions are proposed as explanations for the variation in Smart governance configurations.

In short, Smart governance can be studied as both the explanans and the explanandum. The resulting model highlights the various dimensions of (1) strategies for implementing Smart governance, the Smart governance arrangement, and outcomes of Smart governance. This model forms the basis for research into the (inter)relations between implementation strategies, Smart governance arrangements, and outcomes. The models also has predictive value, since much of the literature suggests that all dimensions need to be adequately dealt with to generate not only first-order outcomes (changes in government organizations) but also second-order effects (changes in the relations between government and external actors), and, most importantly, third-order outcomes (improvements to the city). Future research should also analyze how Smart governance is influenced by contextual factors such as administrative cultures, political or demographic factors, technological factors, and so on.

Appendix

Methodology of Research

The following questionnaire should be answered based on your experience according to the current situation of the each one of the topic of the questions displayed in the current public management of your city.

Question 1: General attributes of smart governance This question is about the key elements of smart governance. Six main attributes have been highlighted based on prior research. We ask you to express your perception on the relevance of these domains in a 5-point Likert-type scale. Only one answer for each one of the attributes is allowed.					
	Level of importance of the attributes				
Smart governance is governance based on ...	Not at all important	Low importance	Neutral	Moderately important	Extremely important
. . . .smart ICT					
. . . .smart external collaboration and participation					
. . . .smart internal coordination.					

(continued)

Appendix (continued)

. . . .smart decision-making processes					
. . . .smart e-administration					
. . . .based on the smart outcomes					

Question 2: Outcomes of smart governance
This question is about the key outcomes of smart governance. Seven main outcomes have been highlighted based on prior research. We ask you to express your perception on the relevance of these domains in a 5-points Likert scale. Only one answer for each one of the outcomes is allowed.

The main outcome that the smart governance is to achieve is	Level of importance of the outcomes				
	Not at all important	Low importance	Neutral	Moderately important	Extremely important
. . . .economic growth					
. . . .citizen-centric services					
. . . .social inclusion					
. . . .ecological performance					
. . . .interaction with citizens					
. . . .strong city brand					
. . . .more efficient government					

Question 3: Dimensions of smart governance
This question is about the dimensions of smart governance. Five dimensions have identified based on prior research. We ask you to express your perception on the relevance of these dimensions in a 5-points Likert scale. Only one answer for each one of the domains is allowed.

How important are the following strategies for realizing a smart city?	Level of importance of the dimensions				
	Not at all important	Low importance	Neutral	Moderately important	Extremely important
Legislation for stimulating smart city					
Policies for promoting smart city initiatives and projects					
Use of ICTs to strengthen smart cities					
An integral vision for a smart city					
Collaborative governance for a smart city					

Question 4: How would you define smart governance?
This question is about the definition of smart governance. It is a free text question.

Note. Adapted from own elaboration.

Declaration of Conflicting Interests

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Note

1. The three projects are named "Smartspaces" (from January 01, 2012, to December 31, 2014) and "NiCE—Networking intelligent Cities for Energy Efficiency" (from September 01, 2011, to February 28, 2014). In addition, the members of the network have been involved in the EU/project named "SMARTiP—Smart Metropolitan Areas Realised Through Innovation and People" (from 01-11-2010 to 30-04-2013) that have just finished.

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