

# AN INSIGHT INTO GOVERNANCE AND POLICY-MAKING DIMENSIONS OF THE SMART CITY CONCEPT FROM THE CEE PERSPECTIVE

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## **Abstract**

The concept of smart city has become increasingly popular, both when addressed in scientific literature as well as from the perspective of contemporary urban policy-making. This concept has been popularized for the purpose of solving complex urban problems, for marketing purposes, and is also politically promoted for local electoral purposes. Although this concept does not have single definition and it has rather fuzzy nature, with somewhat blurred line with »alternative« concepts, it has become the prevailing city label, and neutral connotation might be of help. Based on the review of the literature, three main focuses and developmental areas of the smart city concept exist, that is technologies, human resources and governance, although the literature mostly, but still not exclusively, concentrates around the technological aspects. Moreover, the paper also presents the policy-making evidence on the utilization and proclamation of this concept in practice, adding also the CEE perspective. Namely, often the smartness is taken as a goal of policy-making, but it should be rather considered as a strategy. Policy-makers often neglect strategies or their focus is rather narrow, including also problematic implementation and omitted participation of relevant stakeholders. An issue is also transformation of the existing administrative structures and cultures. The level of economic development and associated financial power of cities strongly determines the volume and intensity of smart city efforts, and thus cities from the CEE region have a comparative disadvantage in this context. Furthermore, cities from CEE region have become involved in smart city initiatives much later than other cities, so this potentially further explains prevailing focus on the technology and technological solutions of smart city initiatives.

## **Points for practitioners**

The paper is relevant to practitioners, as it focuses on strategic and policy-making issues when considering the proclamation of smart city. It presents the potential value added (in political, economic, and administrative dimensions) when utilizing this approach in urban policy-making and it also focuses on potential pitfalls and limitations when creating and implementing such policies, mainly based on the review of the existing practical evidence. Thus, this would enable practitioners to understand what is actually behind the concept of smart city and which cities might be more eligible to utilize this labelling in more realistic terms.

## **Keywords**

Smart City, Sustainable City, City Labels, City Branding, Smart City Governance.

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## 1. Introduction

Smart city concept has become increasingly popular in literature as well as in urban policy-making, if we make judgement based on the appearance of this label. This concept has been popularized for the purpose of solving complex urban problems (like, e.g., social cohesion, environmental sustainability, economic recovery etc.) and is also often politically promoted for local electoral purposes (Nesti, 2018). The problem lies in the understanding of this concept, as there are multiple definitions, concept tends to have a rather fuzzy nature, and is also multi-dimensional. It also has a blurry line to similar concepts, like digital city, creative city, intelligent city, knowledge city, sustainable city etc., and thus intensive debate exists in the literature on the suitability of terminology utilized (see, e.g., de Jong et al., 2015). Namely, some of these labels might focus on technology, some on the development of human capital, some on the development of infrastructure, etc. They share the commonality that they attempt to design and describe some roadmap for the development of the cities in the future (see Gil-Garcia et al., 2015).

In order to cope with the challenges and also to increase competitiveness and visibility, cities started to proclaim the above mentioned labels and implementing related initiatives. It has become relatively common that cities, whether larger or smaller ones, make a proclamation that they either are, or would at least like to become, smart, sustainable, digital, creative, intelligent, etc., a trend sometimes referred to as “urban labelling” phenomenon (see Hollands, 2008). One of the reasons for this lies in the increasing urbanization, where cities around the globe are growing rapidly, thus creating large environmental, sustainability and governance challenges that cities need to cope with (see World Cities Report, 2016). Namely, more than half of world’s population now live in urban areas, and we can observe growth of cities, which generates economic, social and physical problems, stemming also from multiple and diverse stakeholders and socio-political complexity of this large units (see, e.g., Chourabi et al., 2012).

The recognition of this trend and accompanying problems requires from city administration to develop new tools and ways to manage related challenges, including also innovative and more efficient services, increased productivity, transparency and sustainability (Albino et al., 2013; Gil-Garcia et al., 2015). This means that smartness, intelligence, digitalization etc. are needed, when doing urban planning and policy-making, so cities responded with initiatives in this manner. Moreover, these initiatives are not limited solely to city administrations, but we can observe an increased global attention to building and improving capabilities for solving new emerging problems, and this is reflected also in the scientific literature.

The research in this study builds upon providing the answers on the following questions. First, what are the relationship among those labels – are they synonyms or do they describe something else. Second, what is the frequency of appearance of those labels in the literature, and why some of them are more often used than others. Third, are there any potential patterns related to the frequency of appearance of specific labels in different academic fields. And finally, in relation to the concept of smart city, which dimensions in the analysis of this concept prevail in the literature and what is the practical evidence on the outcomes of the implementation practice of this concept.

## 2. Methodology

The research in the paper is based on a mixed method approach, although it builds mainly on the content analysis approach. In the first stage, the so-called manifest content analysis approach (Berelson, 1952) is utilized, where the source of review data is Web of Science Core Collection (2019), which often serves as a database for scrutinizing the development of certain scientific field. The manifest type of approach has become increasingly popular in content analysis research due to the advances in methods and technology, offering higher reliability of research outputs, although it has certain limitations related to validity issues (see Dooley, 2016). In the second stage, also latent content analysis is performed, mainly with the purpose to answer the fourth research question.

As already noted, there is often a blurry line between concepts of smart city, digital city, creative city, intelligent city, knowledge city, sustainable city etc., and we could continue, since we could identify many more similar city labels. Albino et al. (2013) have provided a list of more than 20 different definitions of the concept smart city, and they argue about the confusion that exists when defining other similar concepts. Thus, it is evident that there is a problem with obtaining the uniform definitions of specific labels, and also with marking distinctions among them. Moreover, the list of labels has increased in time, often reflecting the developments in academic fields and the installment of the so-called buzzwords, that sporadically become popularized.

For instance, some authors (see, e.g., Swarnalakshmi and Thanga, 2017) argue that actually smart city has numerous similar annotations, such as intelligent city, digital city, clean city, green city etc., and can thus be taken as synonyms. Similarly, Cocchia (2014) even argues that labels mean pretty much the same, as all relate to »smartness« of the city, and this might arise in the form of sustainability, digitality, intelligence, thus depending only on the meanings and understandings of different words.

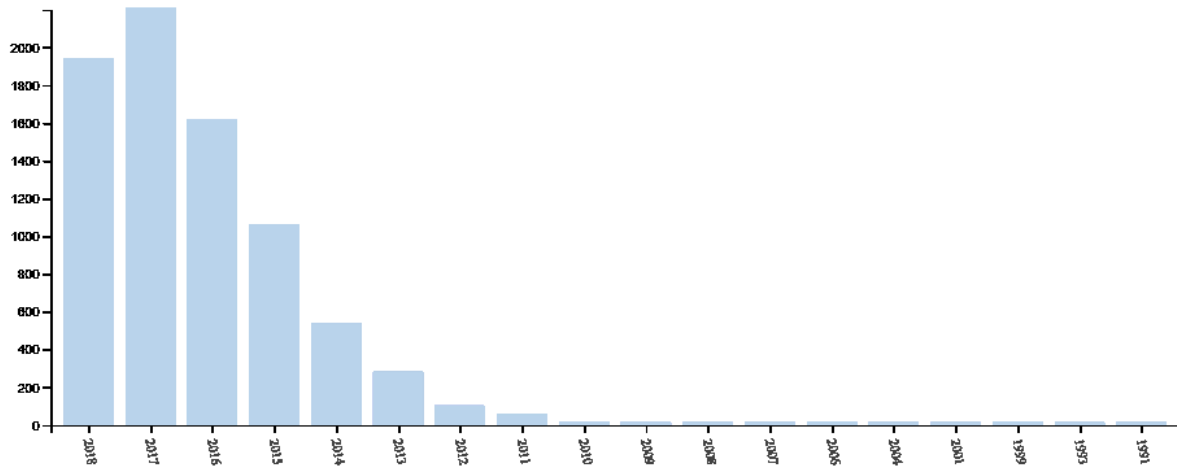
In contrast, some authors (e.g., de Jong et.al., 2015), argue that those categories are actually not conceptually interchangeable and that some labels or concepts are more dominant in the literature. Some concepts are narrower under what they encompass in comparison to others. Some other authors (see e.g. Ben Letaifa, 2015) have developed a hierarchy of labels and have stated that, for instance, the concept of smart city builds upon both intelligent and creative city, where the former is “historically” the oldest one deriving from top-down perspective and focusing on technology, whereas the later derives from bottom-up perspective, thus community-based and private sector initiatives form its core. Subsequently, smart city concept should be, for instance, a combination of both intelligent and creative city, representing balanced relationship among technology, institutions and people.

Slightly differently, Silva et al. (2018) argue that smart city concept represents an agglomerate of other various concepts that utilize ICT, like aforementioned digital city, intelligent city, sustainable city, but it is more holistic in nature. Carta (2015), in contrast, develops slightly different trajectory, where smart city concept is an upgraded version of the creative city (it could be labeled also Creative City 3.0). Interestingly, Chourabi et.al. (2012) have argued that smart city concept builds mostly on intelligent and digital city concepts, which were created prior to the smart city label. Thus, the portrayed discussion suggests that these city labels are sometimes used as synonyms, also due to the fact that there is no uniform definition for the majority of labels, but sometimes they are describing and referring to different things. Moreover, the utilization of terminology is often inconsistent.

### **3. Results**

To follow up, it is evident that smart city has been a relatively new concept, and has become the most popular label if we compared its utilization in the scientific literature compared to other similar labels. For instance, figure 1 below shows the hits in the topic category of Web of Science Core Collection, where we have utilized manifest content analysis approach for labels smart city and its plural version smart cities. The topic category searches the appearance of those words in either title of the paper, abstract or among keywords. In total, 7,727 hits (until 2018) can be found in this database for the label smart city (and its plural version). This label obviously appeared very lately in this database, i.e. in 1991, but the real increase of appearance occurred only after 2013. This suggest that smart city appears to be relatively recently popularized label or concept – i.e., among similar concepts, actually the label sustainable city actually prevailed in the literature till 2012, however the gap between the two labels has substantially increased after 2014 (see Web of Science, 2019).

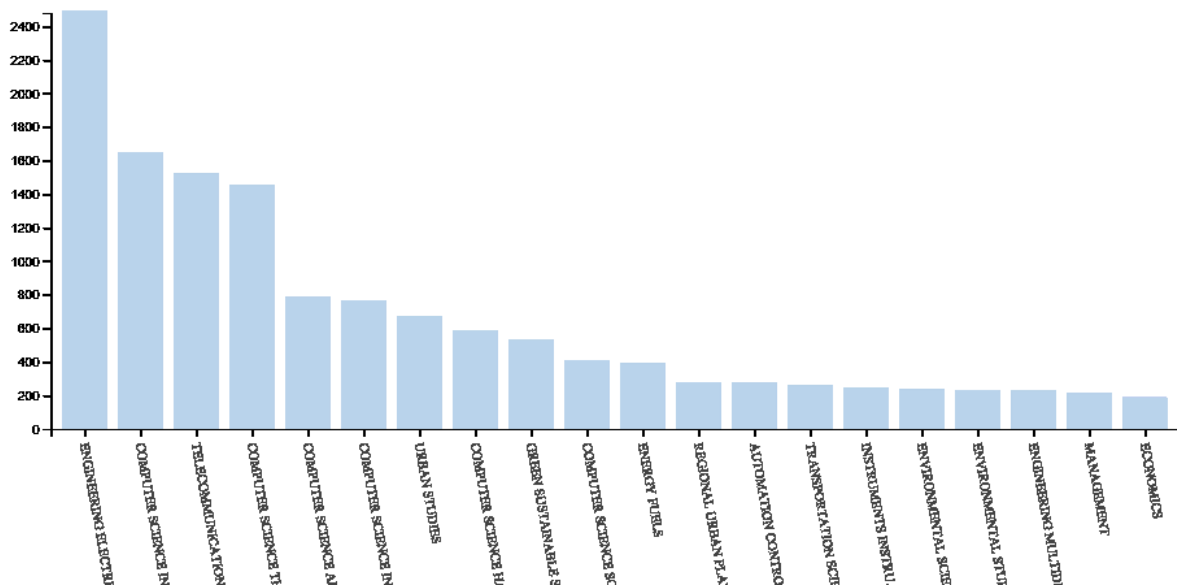
Figure 1: Smart city coverage in Web of Science – number of hits in the topic category till 2018



Source: Web of Science Core Collection (2019).

Furthermore, it is evident that a technological issues prevail when smart city concept is researched, if we make a judgement on the appearance of the label in the above referred hits in the Web of Science categories. Namely, figure 2 below suggests that the six categories to which the majority of hits refer are belonging to the electrical and electronic engineering, various categories related to computer sciences, and to telecommunications. Pretty much the same goes if we extend the list to 20 categories with the most hits – much less reference is namely given to categories of urban studies and planning, environmental sciences, economics or management, etc.

Figure 2: Smart city concept appearance in WoS categories of academic disciplines – number of hits till 2018



Source: Web of Science Core Collection (2019).

The question remains, why the label smart city has become so popular also within the scientific literature. One possible explanation has been provided by Eremia et.al. (2017), who have re-labelling in recent years occurred because more focus was given to sustainability and social inclusion, and the label smart is much more politically neutral than the term sustainability, as sustainability has strong progressivists connotation which voters might not prefer. This suggests that smart city actually denotes sustainable city, but word smart itself is politically more acceptable. In addition, the word smart refers to more instrumental concept that looks for the desired outcome, and smartness is often centered on a user perspective, and entailing strategic directions (Al-Nasrawi et.al., 2015), which gives a concept a rather wise connotation, whereas sustainability refers to a more normative concept.

However, if we relate hits to the Web of Science categories, where they appear, we can observe that variations exists, in which academic fields particular label is utilized more often. For instance, label smart city has the majority of associated hits in the categories related to electrical and electronic engineering and computer sciences, whereas the label sustainable city is more often associated with the academic fields of urban studies and environment related sciences and technologies (see table 1 below). Thus, this offers also one potential explanation for the rising popularity of the label smart in urban self-proclamations, as the technical and technological aspects of smart cities as often portrayed as »technological utopia«, and the flow of research funds has followed this agenda (see Nesti, 2018).

Table 1: City labels and academic fields

Label	Number of hits, topic (since 2015, singular form only)	Two WoS categories with largest number of hits (number of hits in brackets)	
		First	Second
Sustainable city	449	Urban Studies (189)	Green & Sustainable Science & Technology (169)
Smart city	4,136	Engineering, Electrical & Electronic (1388)	Computer Science Information Systems (977)

Source: Web of Science Core Collection (2019).

Moreover, the relative lack of the address of governance and strategic aspects of smart city concept in the literature can also be observed in the Web of Science (2019) database, and this has been further supported also by Nesti (2018), who state that the governance aspects of smart city analysis are lacking in the literature, in particular in comparison to technological aspects. Meijer and Bolivar (2016) also emphasize that technological focus and the role of new technologies prevails when analyzing smart cities, and smart city is considered to be either technical or managerial issue, but consideration of smart city as political issue is missing. Some authors (see e.g. Ahvenniemi et.al., 2017) argue that in practice smart city (evaluation) frameworks lack in particular environmental indicators.

## 4. Discussion

### 4.1 On the governance and policy-making of smart city initiatives

Following, smart city concept or label has become increasingly popular within the literature and policy-making, although this concept also has a critique, as well as some barriers to its practical implementation exist. Moreover, concept itself bears some limitations. We can summarize these into four major points.

Grossi and Pianezzi (2017) argue within the framework of the so-called critical school of thought on smart city concept that smart city represents a form of technological neo-liberal utopia, where business-led technological

solutions are favored in comparison to political and long-term urban planning solutions. Namely, this critical school portrays the concept as problematic, because it is based mainly on self-proclamation and represents a cross sectional neoliberal project of influential corporations and political elite (see Kummitha and Crutzen, 2017). Similarly, Castelnovo et.al. (2016) have argued that smart city concept should not be about the evaluation of the ICT and its contribution to smartness, but about generating and managing public value. However, as the technological dimensions are so heavily addressed in the literature, and this has its own volume, rebranding of the words (like e.g. digital) has enabled growing popularization and presence of the label also in the scientific literature. Thus, the first issue relates to the too extensive focus on the technological dimension of what should be understood under smart city.

RolandBerger (2017) has argued that smart city strategizing usually utilizes partial approaches, as either one dimension of “smartness” is targeted or the sector focus is narrow, where predominantly smart mobility issues are being at focus, and other »sectors« are neglected. Moreover, practical evidence even shows that the factors like the presence of ICT industry or economic attractiveness of particular city tends to represent one of the main drivers of smart city initiatives, since this requires, for example, either smart services or smart mobility (Ben Letaifa, 2015). However, there is often too much focus given to technology instead to service provision and there is a lack of coordination and planning observed, i.e. end-to-end thinking is missing. In addition, problem is often related to the narrowness of the suppliers of ICT-based solutions and insufficient understanding of the needs of the target group (RolandBerger, 2017). Thus, the second issue relates to the problems associated with lack of planning and incomplete strategies in practice when smart city initiatives are being implemented.

The evidence also suggests that smart city is often taken as a static concept, i.e. a goal, but it should be instead considered as a process, where cities are becoming more livable and resilient in order to be able to respond better to existing and upcoming challenges. Smart city concept should not simply represent the transactional relationship between citizens and service providers, but active participation of residents should be encouraged. Besides, leadership is also crucial, since we are bringing together hard infrastructure, human capital, institutions, and digital technologies (DBIS, 2013). Thus, it is important that citizens and other relevant stakeholders are involved into these initiatives, although such involvement might be particularly hard to achieve due to the bureaucratic reasons in less developed societies (see, e.g., Nemeč et.al., 2017). So, the third issue relates to the problems associated with missing feedbacks and lack of co-creation and/or co-production initiatives in practice of smart city implementation.

Finally, practical evidence on the limitations of implementation of smart city concepts indicates a very close connection to the evidence on missing literature. Namely, smart city governance literature usually tends to address issues like citizen participation, partnership, co-production of services, etc., as a backbone of governance concept, targeting value creation for society and citizens. Thus, smart city is not about technologies, but about applying new and innovative forms of governance on them to improve outcomes and processes (Pereira et.al., 2018). In this context, strategy preparation and adoption are greatest challenges to effective smart city implementation, a problem further exacerbated since the governance of smart cities usually works in parallel with the existing administrative structures (Nesti, 2018). Thus, the fourth issue relates to the necessity to create new administrative culture and new administrative structures if we want to implement smart city concept in practice.

To further support the last challenge, discussion needs to be extended. As already noted, cities as making self-proclamations also for electoral and marketing purposes. With this in mind, also various benchmarking methods have been developed to compare and evaluate smart city initiatives, their levels and impacts. These benchmarking comparisons show the diversity of dimensions that are taken into account and looked at (see Anthopoulos et.al., 2015). Nonetheless, these benchmarks and rankings tend to have a very important influence on the decisions of potential investors as well on city administrations to be able to judge their weaknesses and strengths, and thus form the fundamentals of the city marketing strategy (Giffinger and Haindlmaier, 2010). Since city rankings attract attention, represent a competitive instrument, and have positive learning effects, numerous such rankings have

been developed, like e.g. European Smart Cities (TU Vienna), CIMI – IESE Cities in Motion Index, Smart Cities Index, etc., just to name a few. Furthermore, it is not just the cities that are scrutinized, but also their government, like e.g. in the Top 50 Smart City Governments classification.

City rankings and benchmarking addresses several dimensions of the level of smartness of particular cities. Interestingly, some patterns could be found, which could be of particular relevance also to the cities in the CEE region. According to the Smart Cities Study (2017) 85% of the cities have specific projects to promote smart and digital physical infrastructure, but only 60% of cities have formalized smart strategy, and the main barrier observed lies in the complexity of the existing bureaucratic processes at the various administrative levels combined with the lack of alignment between the different actors, i.e. missing coordination. This problem has also been pointed out by Meijer and Bolivar (2016), who stress the role of smart city governance, which requires smart urban collaboration between the actors in the city based upon institutional transformation. Thus, transformation of existing governmental structures is required, in the form of innovative ways of decision-making, innovative administration and innovative forms of collaboration. However, in practice, traditional governance of smart city existing in the form of institutional conservation can mainly be observed.

#### 4.2 On the smart city initiatives from the CEE perspective

The context of cities in the CEE region slightly differentiates in comparison to the cities in the old industrialized regions of the world. This is evident also from the international benchmarking and ranking reviews, where these cities are not hitting the top scores. Not just the institutional and historical reasons are causing that, but also the relative disadvantage regarding the technological advancement and the lagging back in the level of economic development and existing financial and other resources. This is evident also from the table below, when in the European Smart Cities (2014) rankings for smaller cities the ones coming from the CEE region are not taking the lead in the rankings, as shown by the position in the group according to the figures in the last column.

Table 2: City rankings, smaller cities from CEE region

State	City	Smart City Dimensions						Rank
		<i>Economy</i>	<i>People</i>	<i>Governance</i>	<i>Mobility</i>	<i>Environment</i>	<i>Living</i>	
SI	LJUBLJANA	6	7	34	33	21	21	15
SI	MARIBOR	42	22	43	49	15	51	40
EE	TARTU	55	16	35	52	26	55	41
CZ	PLZEN	51	43	73	38	63	23	50
CZ	USTI NAD LABEM	53	53	69	25	50	54	51
SK	BANSKA BYSTRICA	73	51	48	58	33	48	54
PL	RZESZOW	63	64	49	56	56	50	55
PL	SZCZECIN	64	62	50	55	47	65	56
LV	LIEPAJA	56	49	71	21	40	75	58
SK	NITRA	77	60	60	51	23	57	59
SK	KOSICE	76	59	58	37	38	66	60
PL	BYDGOSZCZ	60	68	54	50	64	64	62
HU	GYOR	66	72	53	48	46	69	63
HU	PECS	65	69	40	70	60	59	64
PL	BIALYSTOK	68	67	45	61	72	61	66
LT	KAUNAS	45	46	67	43	76	67	67
PL	KIELCE	71	65	51	65	68	58	68
HU	MISKOLC	69	71	39	63	69	70	69
PL	SUWALKI	67	70	55	57	71	68	70
BG	RUSE	61	74	70	69	62	72	72
RO	SIBIU	74	76	62	73	74	56	73

BG	PLEVEN	62	73	64	76	70	73	75
RO	TIMISOARA	70	75	63	72	75	71	76
RO	CRAIOVA	75	77	59	75	77	76	77

Source: European Smart Cities (2014).

The same can be observed if we scrutinize the CIMI (2018) index, which analyses 165 global cities. From the CEE region, Prague is the highest ranked city, occupying 40th place, followed by Riga, Tallinn and Budapest on 49th, 50th and 53rd place, respectively. For the cities coming from the CEE region, in general, two dimensions that tend to be the weakest, are economy and governance, but also technology and urban planning are usually not taking the lead. In particular, if we inspect the focus of the smart initiatives in the cities of region, transportation, energy and environmental initiatives are prevailing, but these tend to be mostly technologically dominated and also financially very demanding. In this context, it is obvious that the level of economic development and the gap those cities have to the cities in the more developed regions causes that these services cannot be so extensive, and to some extent also they cannot be so advanced (Serbanica and Constantin, 2017).

Besides, Kola-Bezka et.al. (2016) have pointed that cities from CEE region have become involved in the smart initiatives much later than the others. This creates also different incentives for those cities, where a specific advantage of the implementation of the smart city concept may be the creation of the image of a modern and functional city, thus branding the city to encourage the inflow of new residents, investors and tourists, for which these cities are usually struggling the most. This however creates an interesting nexus. As the technology and technological solutions are prevailing usually in the initial stages of city branding, we would expect that human resources dimension and governance dimension will yet to be addressed in theory and in practice of smart city initiatives in those cities. Thus, technology is obviously the first step, but latter on the talents, people centricity, vision, policies and leadership would become much more important in the practice of CEE smart city concepts and initiatives. Hence, this explains current focus on technological solutions and challenges.

## 5. Conclusion

Smart city has been a relatively new concept, and has become the most popular city label just recently, potentially due to being more politically neutral label in comparison to the sustainable city label. The literature is still keeping up with synchronizing the definition of this concept, and lines are often blurred with similar “sister” concepts. Technological dimension of the smart city concept prevails both in theory as well as in urban policy-making, where technology-based initiatives are clearly having a lead. However, practical implementation of the concept generates often problems associated with lack of planning and incomplete strategies, as well as missing feedbacks of relevant actor and stakeholders. Moreover, smartness also necessitates the creation of the new administrative culture, and upgraded levels of smart city governance based upon institutional transformation.

Specifically, it is evident that the level of economic development and associated financial power of cities strongly determines the volume and intensity of smart city efforts, and thus cities from the CEE region have a comparative disadvantage in this regard. Furthermore, cities from CEE region have become involved in smart city initiatives much later than the other cities, which generates variations also in the incentives. In this case, a specific advantage of the implementation of the smart city concept may be the creation of the image of a modern and functional city, so clearly more visible technological solutions are preferred, and less visible human resources and governance dimensions should be at focus later on.



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