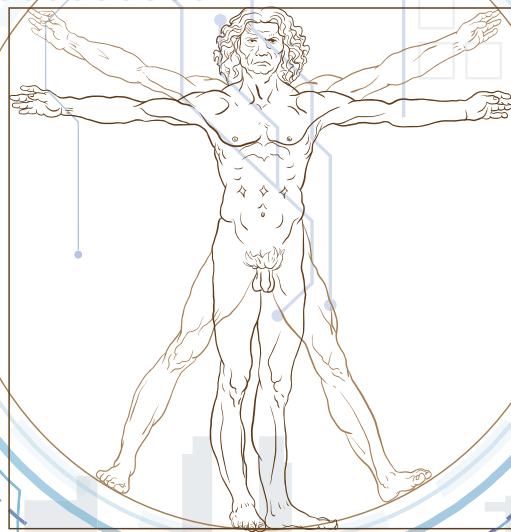# e-FoC

ACADEMY OF ENGINEERING SCIENCES OF SERBIA
UNIVERSITY OF BELGRADE - FACULTY OF GEOGRAPHY

THE e-FUTURE OF CITIES

BETWEEN TEMPTATIONS OF EXPONENTIAL TECHNOLOGY GROWTH AND THE CONCEPT OF HUMAN CITY

EDITOR:
BORISLAV STOJKOV

BELGRADE, 2019

THE INTERNATIONAL SCIENTIFIC CONFERENCE

e-FoC

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(THE BOOK OF PROCEEDINGS)

EDITOR:

PROF. DR. BORISLAV STOJKOV

Belgrade 2019

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THE e-FUTURE OF CITIES

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GROWTH AND THE CONCEPT OF HUMAN CITY

(THE BOOK OF PROCEEDINGS)

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Smart city and opportunity of sustainable city

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THE EDITOR'S NOTE

Cities in the future will be faced with serious trajectory of their development – the transition from traditional mode of construction and functioning to the extremely new mode of electronic functioning by implementing the new generations of ICT. With all positive advantages already known some attention has to be paid to possible, still unknown social or ecological outcomes. Therefore, some facts and a set of dilemmas today, and even more in the future, require great attention of engineering and social sciences, professions and policy making. Even more, the mutual intersection between them will be something that will have substantial impact to the electronic future of cities.

The increase and the concentration of population in urban areas, especially in the big cities and their metropolitan areas, will rapidly grow to dimensions of enormous conurbations and social stratification. The dilemma is to what extent the more or less controlled growth of large cities, especially with the inevitable development of metropolitan areas, can endanger their real capacity (water, energy, transport, land, etc.). Does the new technology can substantially contribute to enhancing rationality, efficiency and reliability of public services, or, if not properly implemented, regulated and controlled (in less developed countries in particular), endanger sustainability of the complex urban system?

The amazing speed of exponential growth of technological advancements will, if it continues as today: (A) completely change the behavior and relationships among the residents of the city, accelerate the mobility and regulate environment, rationalize services, enhance governance or to (B) take control and authority over the people by Internet of Things, with the formula "help people" in cities, sterilize urban natural element ("the Green City concept"), concentrate information by artificial intelligence (AI) at the single point ("singularity"), and generally implement the idea of the "Brave New World". The dilemma will be overwhelming, whether and to what extent the growth and development of new technologies, the AI in particular, can significantly help urban sustainability and resilience (greater safety, efficiency and rationality, taking over manual labor in industry). Or, to what extent could possibly jeopardize it by technocratic community governance, reducing privacy, social segregation, power elite that manages technology, etc.?

The relationship between people and technology is approaching the level where the technology is evolving drastically faster than the possibilities of its application, often with no available proper information on its

progress. The development of know-how on the meaning and application of new technologies within a large proportion of urban population is threatening their privacy with increasing isolation and dependence on those who control technology development even today. The dilemma will be whether the relationship between faster urbanization and rapid development of new technology and applications (Smart City, Smart Metropolitan Area, Smart Mobility, Smart Environment, etc.), based in a large proportion on commercial interests of business, can lead to the human dimension of the city? Whether the rapid development of new technology generates increasing number of non-smart people, and whether their uncontrolled application without a clear and integrally observed needs (strategy, analyses, study), can contribute to the sustainable quality of urban life or not? Whether and to what extent smart technologies enhance the quality of urban life and natural humanity, making it easier for one part of city residents only? Does new technology increase urban cohesion or technological segregation? Finally, does the exponential growth of new technologies with increasing percentage of non-smart people, can produce some uncertain outcomes in the humanity of city, transforming it into mechanical, electronic and digital machine, and raising the query of city ethics and human cognition to follow it, if no regulation exists. The dilemma of city humanity asks for the new concept of human city and it also asks for debate between IT and other engineers with sociologists, culturologists and, probably, even philosophers.

These facts and dilemmas, as observed synergistic, have caused the need to review the current concepts of smart and human city, according to which the human quality and smartness of each city is being measured. At the same time, these facts require an answer to the question of direction, purpose and extent of exponential technology development and its application around the World, usually developed for particular sectors (transport, energy, water supply, tourism, climate change, energy efficiency, etc.), since the large number of cities apply it without clearly glimpsed diverse impacts and mutual influencing other sectors. The question is also, whether the application of new technology under the concept of smart city, but without a clearly scoped integral needs of the city and its citizens, probably defined with the additional human city criteria, may or may not lead to unnecessary investments, and possibly threaten the sustainability of the city.

Finally, these facts and dilemmas are expected to be subject of deep scrutiny in the following years. The International Scientific Conference "The e-Future of City - Between Temptations of Technological Exponential Growth and the Human City Concept" with this book as its output, thematically is covering a number of issues relevant for some of the mentioned dilemmas, exhibiting possible opportunities and threats of cities in their e- future.

Editor:
Prof. Dr. Borislav Stojkov
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KEYNOTES

**BETWEEN TEMPTATIONS OF
EXPONENTIAL TECHNOLOGY GROWTH
AND THE CONCEPT OF HUMAN CITY**

THE CITIES AS INNOVATION HUBS – CHALLENGE FOR PLANNING

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Abrstract: *The role of cities as innovation cores has been broadly discussed in academic, as well as popular press stressing that the urbanity, as the core quality of cities, offers proper creative environment for innovative ideas. They are not just containers for innovative activities but actively involved in the generation of new ideas, new organisational forms and new enterprise (Florida, 2017).*

This fact is reflected in current EU urban development policies. One in four urban strategies supported by the EU Cohesion Funds in current programming period addresses social innovations; almost 40% of them address research and development, digital transformation and innovative forms of entrepreneurship. This trend demonstrates the wide use of EU funds to foster innovation in the territories of the cities and urban regions. (see as well: (EC, 2019)

Keywords: *cities, innovations, smart city*

The innovations in current cities in Europe reach their core quality. Recently urbanity as the generic quality of the cities and main attractor of cities and urban areas shiftes from the freedom of choise "to use" based on density of resources to the freedom "to join and share" based on density of networks where proximity to variety of resources was substituted by proximity to knowledge (see as well: Landry, 2015).

In paralel, majority of papers and concepts deals with the cities as innovation hubs reducing the focuse on innovations just in the production sectors. Even the smart city development strategies are mainly determined by the technology-based concepts of smart city, forgetting that "smart" is not only linked to advanced technologies, but in opposite, with very simple but very efficient approaches and solutions among them nature based.

Much less attention is paid to the cities as the places, where different innovations in productive sectors meet different kinds of other innovations in synergies, mutually influencing each other, creating the multiplication effects, creative environment and deriving tensions accelerating the development. The precondition for sustainability of urban development is exactly the interplay between this whole scale of different innovations, allowing on one side to exclude or to minimize negative side effects and on other side to create preconditions or to increase positive effects of particular innovations or their efficiency.

Moreover, speaking about sustainability the innovations linked to the quality of "urban resilience" have to be addressed. The two main pillars of resilience of the systems are their robustness to sustain and ability to adapt to the shocks. This adaptability is directly linked to the system innovations, it means positive

development changes allowing to the system to sustain to the shocks by its quality development. The shocks can affect the cities form external environment but can be caused by internal elements and their development.
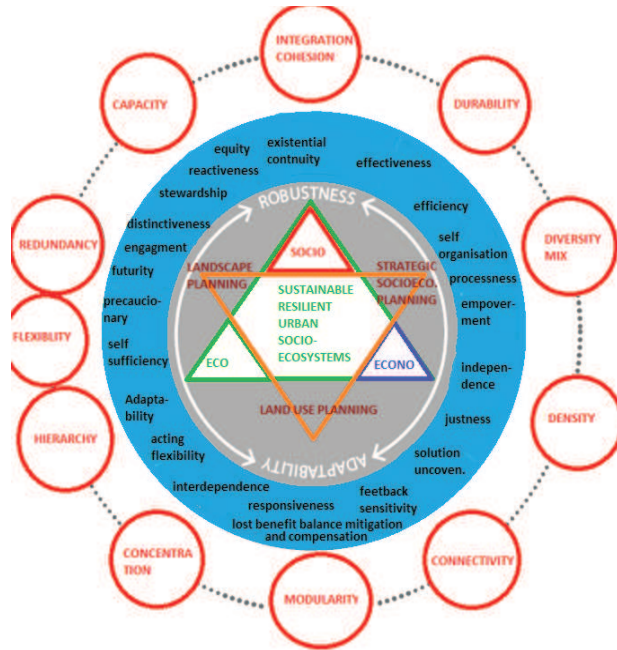
FIGURE 1: Robustness and adaptability as the pillars of urban resilience and sustainability (source: author)

Current cities represent very complex social ecosystems with high diversity of their functional and structural elements, with high intensity of interactions and interdependences between them. They are increasingly dynamic in their development, as well as everyday processes including urban metabolism. Increasing development dynamics of urban social ecosystems is closely connected with growing tension between innovation cycles in their different subsystems. The gap behind this tension, characterized mainly as the gap between high societal dynamics and low dynamics of material urban structures, seems to extend into the gap between the high dynamics of technology development and lower social dynamics especially speaking about social innovations linked to proper societal absorption of technology changes. The results in form of new social exclusion, electronic crime, growing vulnerability of existential infrastructure, destruction of social relationships via their virtualization, pathologic dependences on internet, and destruction of justness of current territorial government system due the growing mobility and fuzzification of the city borders are only some of the examples of lagging social innovations.

Policy documents at different levels, starting with the UN Habitat III New Urban Agenda, through Territorial Agenda 2030, UNDP documents, up to the national implementation documents of Agenda 2030 across Europe identified the need to close the gap between the state of art of the knowledge and societal practice, to use accumulated know-how and available technologies for sustainable quality of life and to learn from positive and negative examples from practice in order to foster transitions towards sustainable resilient urban socio-ecosystems represented by the cities, their agglomerations and urban regions.

Similarly to the brownfields, abandoned urban areas not being (from different reasons) able to continue natural circular evolutionary innovation processes building up on their endogenous potentials and to adapt themselves to the new requirements (innovations) of society, there does exist real danger of appearance of

social groups and communities negatively affected by the combination of rapid technology development not having internal capacities to respond properly by developing and/or introducing adequate social Innovations.

In this context, the harmonization of different development dynamics as one of most important tasks for public governance interventions into urban development, including the planning interventions, seems to get new dimension. The common denominator for this harmonization can be sustainable development of the quality of life in the cities.
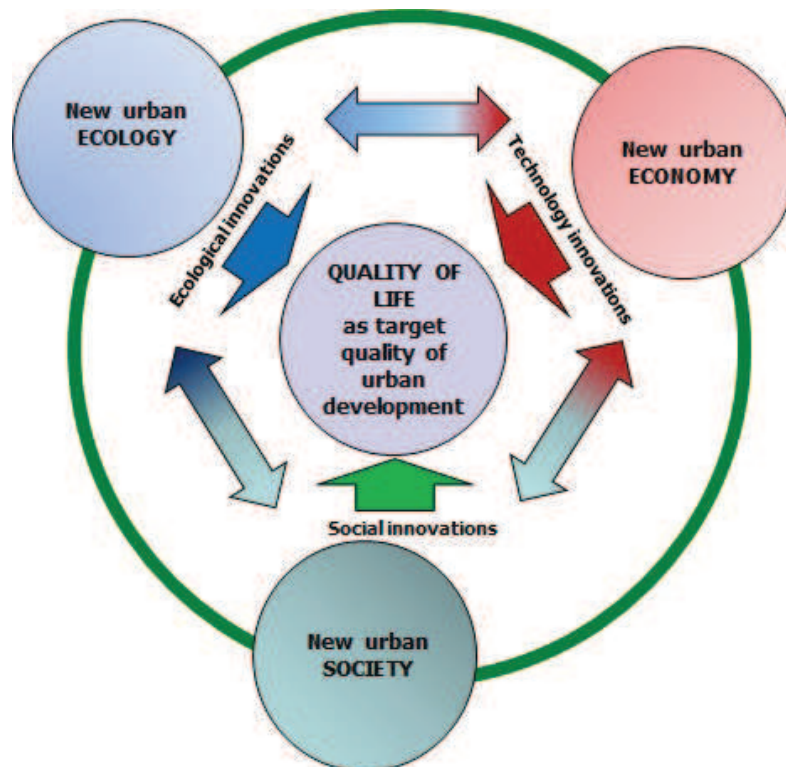
FIGURE 2: Quality of life in the cities as the common denominator for harmonizing
different types of urban innovations (source: author)

Current development in social, environmental and economic pillars of sustainability tends to the creation of common interface of new quality of urban economy, urban ecology and urban society in which they play, mutually supporting, new roles. In this interface the leading innovations are derived. The development of this new quality is researched and conceptually covered by joint research centre of the Alliance for Smart Sustainable Development and Innovations of European and Chinese Universities (SSDIA) in Shanghai and Bratislava as the basis of new type of urbanization processes contextually interlinked with the new content of the quality "urbanity" as stated above.

To harmonise the interplay between the innovations representing the development of new type of urbanity determined by synergies between new urban economy, new urban ecology and new urban society an innovative system of management tools is needed since new urban economy is no longer only about capitalisation of resources, new urban ecology is not only about protection of natural values and new urban society is not only about satisfaction of the growing demands. It is about an interplay of different actors and their changing role in the economy, ecology and societal development, it is about the public sector as active actor of economy, about economic activities contributing to social wellbeing and environmental sustainability including mitigation of climate change effects.

New positions, functions and involvement forms of different actors from public as well as private sector in the management of urban development built on the triangle new urban economy – new urban ecosystems – new urban society should be mirrored in the architecture of the system of innovative management tools optimizing the interactions in this triangle. This system should be able to support the development of new innovation-based urban economy efficiently capitalizing potential of urban ecosystems to provide ecosystem services using the synergies between nature based solutions and innovative technologies.

Proper capacities to guide nature-society interactions toward more sustainable urban development should be developed following the concept of triple helix (interlinking public sector, economic players and academia/R&D framing the circle of urban innovations created by ecological, technological and technical (incl. urban functional and structural), product oriented and social (institutional, behavioural, organisational) innovations.
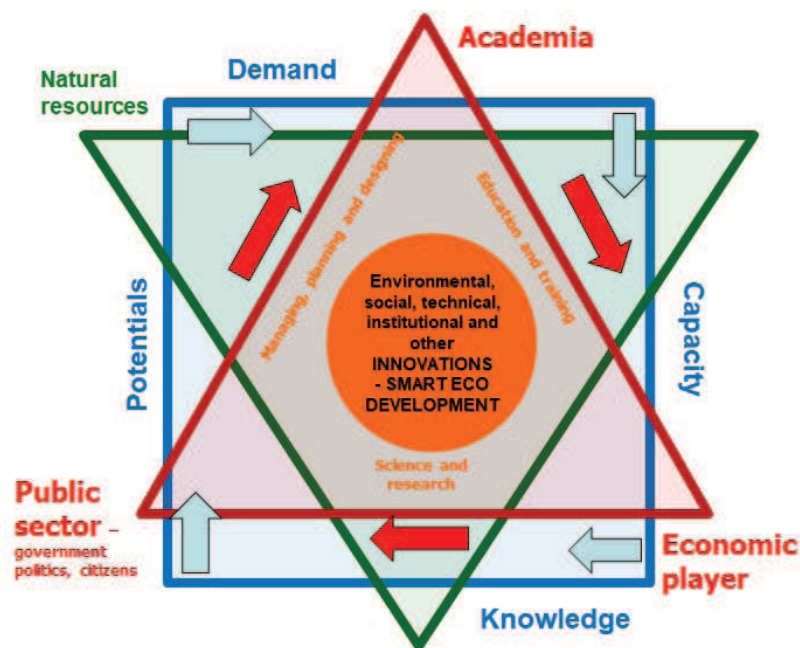
FIGURE 3: Triple helix as the bases for innovative management system (source: author)

The conceptual framework for new type of urbanisation processes can be build up on integration of 3 main innovation domains led by new concept urbanity as follows:

1. The innovations in the domain "development and use of resources" are widening the concept of eco-city as defined by the Eco-city concept extending the concept of ecosystem architecture and ecosystem services (see e.g. Millennium Ecosystem Assessment (2005), Ecosystems and Human Well-Being: Synthesis (2005), *D. Aberley, ed. (1994), Futures By Design: The Practice of Ecological Planning. Gabriola Island, B.C.: New Society Publishers*) to the sphere of others than only natural resources including human resources and knowledge. This innovative approach bases on the idea of the use of synergy effects of technical/technological, social (behavioural, institutional, organizational) and product-oriented innovations towards sustainable effective and efficient use of all resources including nature-based solutions for development, restoration and rehabilitation of urban social ecosystems for the safeguarding of sustainable urbanization. The idea behind is to develop a "model of smart eco-city as the material reality and social construct of smart eco-society" to be a self-learning open community to meet the shared human challenges of the environment and de-

velopment with the aim to emphasize the well-being of citizens and urban community, promoting social equity, economic sustainability and respect for ecosystems; Inherent part of this model is the concept of urban ecosystem services, the benefits humans generate from ecosystem functions in urban areas and which are important for improving resilience and quality of life in cities (food supply, water supply, microclimate regulation, air purification, pollination, recreation and biodiversity). One important aspect reflected in the model is to navigate interconnection between landscape pattern and urban ecosystem processes (destruction of habitats, biodiversity loss, the degradation of ecosystems, unsustainable, non-resilient urbanization…).

2. The innovations domain "capitalisation of resources" is widening the concept of Smart city towards new quality of urbanity as freedom „to share" based on density of networks the crucial quality and the main factor of attractiveness is creative environment determined by proximity to knowledge resource (see e.g. (M. Deakin, 2012)) beyond just implementation of technology innovations

3. The "social innovation" domain builds up on domain concept of Smart governance concept reflecting multilevel architecture and multi-actors involvement build on institutional and social innovations for smart eco-regions governance (see e.g. (Ostrom, E, 2010; Finka, M., Kluvánková, T., 2015)).

The platform for the integration of these 3 innovations domains is the synergetic interpretation of the urban systems as integrated social ecosystems of functional urban areas (FUAs). They include the cities and their surrounded areas in permanent dynamic transformation including instabilities, internal bifurcations, responses to external interventions and shocks. (see e.g. (Adger, W.N., 2000)) In the transformation process the interplay between self-organising processes and target oriented control interventions of the management systems including the planning interventions plays specific role. The use of synergetic platform allows to the model to focus on effectiveness as well as efficiency of the management intervention in multi-stakeholders environment under high level of uncertainty in the decision making.
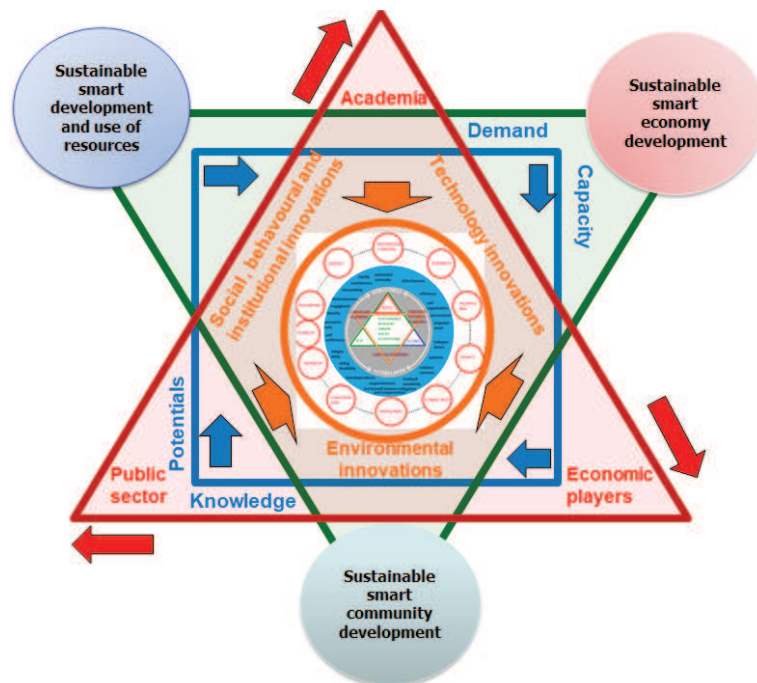
Figure 4: The concept of 3 interlinked innovations domains

The synergetic approach supposes innovative use of knowledge on ecosystems, on their functioning, their sustainable management, restoration and rehabilitation for novel forms of governance models to foster transformation of the cities towards resilient urban social ecosystems.

To achieve this, social innovations linked to the novel forms of governance have to be focused on:

- enhancing social interactions towards self-learning and self-regulating communities as the units of civil society;
- Innovations in work systems: including teleworking, high mobility of entrepreneurs, co-working spaces, open office areas
- Culture-led innovation, typically stemming from the creative knowledge of the arts and cultural domains and inspiring many city-relevant sectors and areas, including cultural tourism, consumer electronics and urban regeneration.

For knowledge-based organizations and societies to be constructed there is a need for a social change, in which the values of innovation and entrepreneurship are benchmarks, generating a culture open to changes and capable of producing change itself. A key task is to explore the role of social culture in its bid to encourage innovative attitudes and skills held and wielded by people, organizations and territories, and to investigate potential systems and mechanisms that would facilitate

As stated above, the complex problem of the cities as innovation hubs is not the problem of technologic development and economy. It is a complex problem addressing the whole scale of urban life phenomena which require integrated approach, the platform of which creates spatial planning interlinking technology innovation with the environmental, social (institutional, legal, behavioural, organisational) innovations with common denominator of sustainable quality of life.

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PRACTICE MAKES SMARTER? A FOCUS ON TURKISH AND SLOVAK SMART CITY PRACTICES

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Abstract: The idea of creating smart cities or making the existing cities 'smarter' is a popular concept on both international and national levels. Although, there has not been yet an international consensus on the requirements on what actually a smart city is, IESE offers a rough categorization of human capital, social cohesion, economy, governance, environment, mobility and transportation, urban planning, international outreach and technology (IESE, 2018). Additionally, a UN report by Economic and Social Council indicates the increasing "need to localize smart infrastructure" (UN, 2016). On local level, governments aim to implement smart city projects with a wide array of different perspectives. Creating smart cities is not an easy task due to the fact that emerging problems might not be purely technological. Besides global smart city ideal, interested parties have to implement this ideal to the local "spatial and social context" (Husár et al, 2017). An evident sparsity of "critical social or political analyses" on smart urbanism approach (Marvin et al, 2015) creates a need to research more on how project decisions are made and their social impacts.

The aim of the research is to focus more on Turkish and Slovak smart city practices and to evaluate its capacity to create inclusiveness during the decision-making processes of smart city interventions. There are number of case studies on both countries' sides. The special focus of this study is on Turkish side on 8 leading smart cities of, which are İstanbul, Bursa, Ankara, Eskişehir, İzmir, Denizli, Antalya and Adana, expected to reach "sustainable city level", according to Frost and Sullivan consulting company report by the year 2025. Different scales of projects are made from national to local levels such as "National Smart Cities Strategy and Action Plan" for the period of 2019-2022 and individual EU funded municipality projects etc. On the Slovak side, we focus on 2 cities which prepared and are implementing the smart city strategies and evaluate how the idea of smart city is understood and what are the implemented solutions. This research discusses the Turkish and Slovak cases according to the theoretical knowledge on smart city concept with the help of the content analysis of written documents on selected cities. It is aimed to provide an additional perspective for whole smart city discourse from the Turkish and Slovak context.

Keywords: *smart city, local government, municipality projects, Turkey, Slovakia, inclusiveness*

1. INTRODUCTION

Rapid urbanization at the beginning of the 21st century is a continuation of rapid expansion of cities and urban areas from the late 20th century. The notions of guiding and softening the growth of the cities towards the environment and the society have been in place late 19th century (e.g. the Garden city movement) and was occurring during the past 20th century in terms of city development concepts and planning ideas up until more recent ideas of green cities or sustainable cities aiming at making the cities better, healthier places to live in for its current and future users. In this light, the idea of making cities smart is a natural continuation of these efforts to make cities more liveable, vibrant, socially just and environmentally friendly, reflecting the advancement of the society in the beginning of the new millennium. Currently, the urban discourse is using terms such as creative city, resilient city and other and sometimes these expressions are becoming nearly meaningless and interchangeable. In this paper, we perceive smart city as ever more encompassing idea than simple rolling out of technologies in the city and their use to make city more appealing from technological point of view. This is given by the ever-increasing complexity of urban systems whose management is creating urgency to look for more efficient ways to manage contemporary urban challenges (Nam & Pardo, 2011) with the help of technological advancements available today.

The objective of this paper is to analyze and examine the development of smart city concept in Turkey from the smart governance point, i.e. the ways the cities are opening their administering systems to include its citizens and citizen groups in the decision-making processes. We examine 8 Turkish cities (İstanbul, Bursa, Ankara, Eskişehir, İzmir, Denizli, Antalya and Adana) and smart city strategies they have produced focusing on how the smart governance is set up and how it had been implemented so far. The paper, firstly, examines the concept of the smart city, its objectives, target groups as well as its weaknesses and threats coming from misinterpreting these ideas based on literature review. The second part is dedicated to reviewing implementation of smart cities in Turkey and Slovakia based on available resources related to smart city concept. The third part presents and discusses the methodology and the fourth part presents the results. The final part discusses the results and implications for future study.

2. SMART CITIES

2.1 Defining smart cities

Development of the society including the economic dimension, particularly in the EU, is closely linked to transformation of the industrial to post-industrial, knowledge-based society. This process is affecting all aspects of life of the society starting from agricultural sector, industry, services up to shift from government to governance. Communities throughout the world face a number of challenges that threaten their viability and the sustainability (David et al, 2018). This is not only due to gradual shift to urban population where first time in the human history more than a half of global population lives in urban settlements, but mainly due to concentration of economic, social and cultural activities in the space of cities and city regions, cities are key for the development and represent accelerating force of the economy based on innovations capitalizing human knowledge and inventions. In this context, more than two decades ago, the term smart city began to be discussed in both academic circles and among practitioners or urban planning and decision making as a concept used to encapsulate responses to all these challenges (Chourabi et al, 2012; Kitchin et al, 2018).

One of the most well-known definitions of smart city both in academic literature and policy papers, with more than 1500 citations according to the Google Scholar, is "[a] city well performing in a forward-looking way in economy, people, governance, mobility, environment, and living, built on the smart combination of endowments and activities of self-decisive, independent and aware citizens" (Giffinger et al, 2007).

The appealing of this definition we believe is that it avoids being limited to purely technological view and encompasses various aspects of cities and is wide enough to capture the complexity of problems our cities are facing.

Albino et al (2015) collected a list of more than two dozen definition of smart cities to portray the variety of views and imaginations of what the smart cities are. Majority of the definitions are related to sustainability and gradually authors are moving from diffusion of ICT to people and communities. Albino et al (2015) also argue that from commercial and technological point of view, smart city is portrayed as a city with strong presence of ICT and these are permeating to commercial application into cities and homes (smart homes and smart buildings as systems equipped with a multitude of mobile terminals and embedded devices as well as connected sensors and actuators).

Cities of 21st century from all over the world are qualitatively different from their predecessors in the past in terms of used technology. Although from the end of 19th century onwards the utilities and their rollout significantly changed the nature of cities and enabled new quality of life (homes with electricity and natural gas or public transportation systems in cities for instance), the new technologies today are gradually shifting lives from physical to virtual space. David et al (2018) note that smart cities are conceptually mediating the tensions between the city that is grounded as a physical entity and the city that floats as a networked part of a global system.

Majority of publications related to smart cities are discussing and focusing on the technical issue of smart cities, mostly ICT solutions helping the cities to manage themselves (Kazmierczak et al, 2018; Husar et al, 2017). These are coming from the idea that the 21st century cities are not connected by roads, but by digital networks (Townsend, 2013). Kazmierczak et al (2018) in the recent paper study the technical element of smart cities and argue that smart city research has been so far focusing on these areas – cognitive works and case depictions with various scope and level of detail, and thematic oriented studies and works focusing on one problem area studying relations between sustainable approach and issues of spatial approach in urban development, for instance social issues, logistics or other aspects of smart cities and their smartness. Arroyo et al (2018) associate smart cities with the principle of sustainable development of urban areas including aspects of infrastructure, technologies and democracy and stress the dimension of social development as crucial for connecting cities with their heritage and its management which is particularly useful in Turkish context and our case studies as almost all of them are famous for rich cultural and architectural heritage in their cores.

2.2 Sceptics of smart cities

Smart cities are not a topic just for planners and urbanists, but it comes in a kind of bandwagon with real estate interest, civil engineering and also IT and digital media corporations. Besides grand visions and positive connotations often connected to smart cities and their promotion as the future of urban development, there is a number of critical authors addressing various concerning issues about smart cities. One needs to be cautious when reading current smart city strategies of current cities and recent literature and smart city is being portrayed as a panacea for all urban ills (Varghese, 2016; Odendaal, 2015). Uncritical perception and blind acceptance is a threat of many concepts and ideas, being 'trendy' can hardly be the only justifying parameter and when studying the Turkish cases this often might be the case.

Greenfeld (2013) fears that cities will be abstracted from social and cultural ties with their built environment rendered obsolete, and their overall existence undermined by technology. Graham (2010) and Graham & Marvin (2002) criticize the overall dependence of cities on infrastructure without focusing on smart cities, but on ever present technology forming a backbone of more cities. They also raise concerns of highly modernist discourse of control and perfect real-time anticipation brought under a kind of panoptic

surveillance machine. Mitchell (1999) contends that society is heading for "death of cities, which are nothing more than leftover baggage from the industrial era" (p. 157).

Use of technologies can be indeed seductive (Althusser, 1971), productive, convenient and promising freedom of choice (Kitchin & Dodge, 2011), but can be "can be a veil, obfuscating the broader agenda and processes of neoliberalization and accumulation by dispossession that may disadvantage citizens in the long run" (Leszczynski & Kitchin, in press, In Kitchin et al, 2018).

Kitchin et al (2015) summarized the weak parts of smart city concept in five points: (1) growth of technocratic governance, (2) hollowing out of the state and corporatization of urban government, (3) creation of buggy, brittle and hackable city systems, (4) the production of panoptic surveillance, and (5) promotion of instrumental rationality and realist epistemology in the politics of urban data. Sennett (2012) adds that smart cities are failing to make people smarter as they do not enhance one's ability to think for himself and communicate with others as technology is rather trying to supersede these capabilities and in practice might inhibit them.

To sort of summarize the critique of smart cities in the contemporary discussions, it is important to stress these concerns are not new and the scepticism over smart cities have been present in the literature from 1990s onwards when modern urban planning ideas leaning on technologies and intelligent cities were deemed as messianic (e.g. Benedikt (1991)). Marvin (1990) discusses this matter even further in the history when the telegraph and telephone were invented and how these were predicted to alter and worsen the life in cities. This scepticism is natural, however caution and discussing these topics is important especially for academia as gatekeepers.

2.3 Smart governance

One of the six basic elements of smart cities according to Giffinger et al (2007) is smart governance. Smart governance in this regard includes participation in decision making, public and social services transparent governance in political strategies and perspectives (Giffinger & Gudrun, 2010). Meijer & Bolivar (2015) argue that governance in smart cities is about crafting new forms of human collaboration through the use of ICTs to obtain better outcomes and more open governance processes. We believe this is rather narrow-view perspective as new types of participation are not necessarily all involving new technologies, but within smart city perspective we need to capture the new way how stakeholders (citizens, NGOs, private entities, public bodies) are approaching and want to be included in decision making processes. No longer public participation is about informing them about the taken decisions or formal ways to include stakeholders, but stakeholders are becoming equal partners as much as possible in public projects, from small, community-based initiatives up to large infrastructure construction projects. This is not only due to formal reasons, but stakeholders might have vast knowledge, including tacit knowledge, which has potential to improve the status of the project and help in perceiving the projects and their future use. What is smart in this view is that we are looking at stakeholders as partners and to ensure this we can a number of methods and many of them, but not all, are based on the use of new technologies. Therefore, in this paper we are looking into smart governance as a way how stakeholders are included and actively involved in the decision-making processes in smart city projects.

3. SMART CITY CONCEPT IN PRACTICE

3.1 National level in Turkey

Before going into detail on the 8 assumed Turkish smart cities, we have to present the smart city perception both on national and local levels in Turkey with an emphasis on the general body of rules.

In Turkey case, there are several legislations, which direct the smart city practices at national level; Five-Year Development Plans, Ministry of Environment and Urbanization Plans (differing scales from 1:100.000 to 1:25.000), Regional Plans (Strategic reports prepared by Regional Development Agencies), Municipality Plans (1:5.000 and upper scales).

State is responsible for creating a general framework for development in the following five-year planning period. In other words, these five-year plans are long-term strategies of the country. These plans prepared by State Planning Organization until 2011. Since 2011, the Ministry of Development has been the responsible institution on preparing this document. Turkish Grand National Assembly approves these plans. Five Year Development Plans prepared by Ministry of Development is accepted as one of the leading advisory documents on how the main investments will be channeled. What is the most striking is that there is not a single smart city strategy included in these plans until the most recent Five Year Development Plan (10th Plan, 2014-2018).[1] 10th Five Year Development Plan includes smart strategies as follows: urbanization and urban transformation (smart buildings, p.90); infrastructure, capacity and skill levels with the help of ICT (smart applications, p.97); decrease in road accident mortality with the help of Electronic Traffic Control Systems (Highway traffic strategy and action plan, p.111); improved urban transport (environmentally sensitive, smart, efficient and cost effective applications, p.130). As it can be seen, smart city strategies are mostly focused on the improvement of existing infrastructure with an emphasis on urban transformation and transportation.

In addition to the five-year plans, General Directorate of Geographic Information Systems in Ministry of Environment and Urbanization is responsible for preparing the upcoming national smart city strategy for Turkey. Most current national plan which is called "National Smart Cities Strategy and Action Plan 2019-2022" includes three main pillars: smart city ecosystem, massive investments, Turkey's being an open market in terms of smart city. In this national action plan, governance is defined as a mechanism that "encompasses training and guidance services and legislative work, which provides a common understanding, coordination and collaboration within and between institutions and to manage policies together and interactively". Thus, the question here is who are these institutions exactly and until which point they have a say in decision-making?

There are certain opportunities and threats for smart governance. Main motivations of governance branch is "preventing miscommunication, increased ownership, preventing duplications, development of smart city industry, efficient use of resources in the construction, maintenance and/or improvement of smart cities, and proper financing methods and investments, contribution to the understanding of the obstacles and difficulties in the financing and procurement of smart city projects, increased collaboration and sharing of information between stakeholders, enhanced time management by identifying roles and responsibilities and correct use of the workforce". On the other hand, there are certain challenges the smart governance might encounter, such as: "no interoperability habits between the private sector and the public, reluctance to share data among stakeholders, no standards set for data sharing, inadequate and/or incorrect use of resources allocated to smart cities, inability to make innovations for needs in local governments, challenges in creating a welfare environment for smart city investment, having duplicate projects resulting from lack of interagency coordination and cooperation, inability to perform monitoring and evaluation of projects and change management".

3.2 Local level in Turkey

There are number of stakeholders assigned to cooperate on local level in Turkey. There are Regional Development Agencies as advisory boards, state provincial organizations as administrate positions, greater and district municipalities as elected officials. Consequently, municipalities are the ones that are expected to produce concrete projects for the residents of the province.

1   8th and 9th Five Year Development Plans are also available in English on website. www.sbb.gov.tr/kalkinma-planlari/.

The one of the most important actors in the implementation of smart city projects in Turkey undoubtedly are the local governments. Most of the smart city applications in Turkey are procured services by the state from private companies (Bilici and Babahanoglu, 2018). Nevertheless, the most important problems faced by local governments in implementing the smart city policies introduced by the government are the issues related to financing them (Kutlu, Örselli and Çelik, 2018). All in all, municipalities have great responsibility both on providing the smart city implementations and dealing with the existing developmental problems of the provinces. This might create a deadlock for them.

4. METHODOLOGY

We are using as the main research approach as the method of case studies by looking into 8 Turkish cities and 2 Slovak cities which had prepared or are in advanced process of preparation their smart city strategies. We are looking into how the concept of smart city is understood and defined and in particular we are interested in how smart governance as an inherent part of any smart city strategy is defined and operationalized as well as the implementation of first measures as most of them are strategies just being launched. For smart governance we use the definition by Giffinger & Gudrun (2010) as including participation in decision making, public and social services transparent governance in political strategies and perspectives. Within the selected case studies, we are using content analysis with two purposes in mind. The first purpose is to remove much of the subjectivity from summary. The second purpose is to simplify the detection of trends. To define smart cities, we are using desk research method of literature review based on recent literature and previous work of both authors. Special emphasis here was on critical assessment of term smart city to unravel hidden consequences of noncritical use of the term and how it can be interpreted by some actors in the public and private sector.

5. CASE STUDIES

After the brief explanations on smart city perception at the national and local level, now it is the time to move on to more concrete examples on the case of Turkey and Slovakia.

Table 1. (TurkStat, 2018)

Province	Population	Number of Municipalities (Districts)
Adana-1	2,216,475	16
Ankara-6	5,445,026	26
Antalya-7	2,364,396	19
Bursa-16	2,936,803	17
Denizli-20	1,018,735	19
Eskişehir-26	860,620	14
Istanbul-34	15,029,231	40
Izmir-35	4,279,677	30

Table 2. (Statistics Office of the Slovak Republic, 2018)

City	Population	Number of Districts
Bratislava	431,864	5
Nitra	76,655	1

For Turkey smart city case studies, the Frost and Sullivan consulting company report was the starting

point of the selection of sample. In that report, it was aimed that these 8 cities are expected to reach a certain sustainability level in terms of smartness by the year of 2025. Therefore, it was interesting for us to research more on the cities on the possibility of such strong assumption. Based on the high number of districts (Table 1.) of the 8 subject cities in Turkey, greater municipalities are selected considering the fact that they are the highest level of management in local government besides local branches of national governments (governor's office) and are the most active project leaders in most cases.

In the following part, four main questions are asked about the these cities in order to make a certain grouping that is supposed to create a more fruitful explanation the whole situation. The questions are related to number of municipalities, number of smart projects done so far (in some cases still in progress), types of actors involved in projects and the level of citizen participation.

5.1. Cases from Turkey

ISTANBUL

How many municipalities?

Istanbul has 40 district municipalities with different amount of population. Istanbul Greater Municipality has Smart City Directorate, which is specially assigned to conduct the smart city projects within their administrative borders.

How many smart projects?

Total number of smart projects is not known for Istanbul. Each and every municipality has number of smart projects on their agenda. Istanbul Greater Municipality has smart city projects under 7 main headings: environment, sea and coastal structures, service structures, city aesthetics, culture, sports and transportation. Information gathered from Istanbul Greater Municipality Website on Smart city projects is detailed in Appendix I.A. Istanbul RDA has smart governance, smart growth, smart transportation and smart network (technical infrastructure) for 2014-2023 periods.

What type of actors are involved in the projects?

Contractor companies are responsible for the projects that are grouped as smart projects of IGM (□stanbul Greater Municipality). Almost all projects are given to subcontracting firms based on the information given on the website. IGM is the main coordinator for allocating smart city projects to the private sector. Municipal council decides on the type and location of the projects and the public procurement process follows this decision.

At what point citizens can participate? (Before, during the process, afterwards)

There is a possibility for citizens to vote after the completion of each project on the website. At the end of each project's page, there is an assessment section, which demonstrate satisfaction rate on the scale of 5. Not in the preparation process of these smart city applications, but afterwards citizens are assumed to be involved in the process.

BURSA

How many municipalities?

There are 17 municipalities in Bursa province. 3 (Osmangazi, Nilufer and Yildirim) out of 17 of them are central ones. Around 1.9 million people living in the province center. Around 65% of people in this province can get the smart city application services. The rest is utilizing the other type of municipal services.

How many smart projects?

Bursa greater municipality has smart city applications under 5 main headings: transportation, management,

environment, community and health (See Appendix I.B) BEBKA (Bursa RDA) has smart growth, smart transportation and smart architecture (LEED certificates etc.) strategies for 2014-2023 periods.

What type of actors are involved in the projects?

Greater municipality is the main actor in smart city projects. Subcontracting firms are the main service providers also in this case. Regional development agency supports the smart growth via grant provision (from state funds to local projects) to projects related to smart city ideal.

At what point citizens can participate? (Before, during the process, afterwards)

Bursa residents have the ability to report and give feedback on the existing smart city practices. There is a mobile application for the suggestions and complaints. So, citizens can participate in the process afterwards maybe for a chance of practical improvements in the future.

ANKARA

How many municipalities?

There are 26 municipalities in Ankara (capital city) province. 8 (Altindag, Cankaya, Etimesgut, Golbasi, Kecioren, Mamak, Sincan, Yenimahalle) out of 26 of them are central ones. Around 4.7 million people living in the province center. Around 85% of people in this province can get the smart city application services. The rest is utilizing the other type of municipal services.

How many smart projects?

Ankara greater municipality aim to create smart city practices under two main headings: transportation and other (See Appendix I.C). Other group consists of the digitalization of many services offered by the municipality with the help of Geographic Information Systems. A number of mobile applications are introduced for the Ankara residents according to the smart city practices. Ankara RDA additionally has smart specialization and smart energy strategies for 2014-2023 period.

What type of actors are involved in the projects?

As in the previous cases, greater municipality is the leading actor in smart city projects. Subcontracting firms are the main service providers. Most importantly, since Ankara is the capital city of Turkey, most attention is given to the smart specialization on the some specific industrial sectors. Defense and Aeronautical sectors are given most importance because these sectors agglomerates and have bigger share in the production compared to the rest of the regions and provinces.

At what point citizens can participate? (Before, during the process, afterwards)

It is highly top-down decision-making mechanism. Nevertheless, there is a 24/7 phone line (blue line) that greater municipality operate that citizens can reach municipality on possible problems also related to newly introduced smart city projects within Ankara province.

ESKISEHIR

How many municipalities?

There are 14 municipalities in Eskisehir province. 2 (Odunpazari and Tepebasi) out of 14 of them are central ones. Around 750.000 people living in the province center. Around 80% of people in this province can get the smart city application services. The rest is utilizing the other type of municipal services.

How many smart projects?

Eskisehir greater municipality offers a number of smart city practices (See Appendix I.D). Mostly it is

based on increasing accessibility of municipal services via e-municipality applications. This municipality has also potential to collaborate different EU countries as compared to other cases. Tepebasi municipality has EU funding for the smart transformation of industrial area in city center. Additionally, the knowledge is shared between municipalities. BEBKA (Eskisehir RDA) has smart growth, smart transportation and smart architecture (LEED certificates etc.) strategies for 2014-2023 periods.

What type of actors are involved in the projects?

Compared to other cases, Eskisehir has potential for gathering different stakeholders from outside the province. It is highly open for foreign investments on the smart city practices, although the existing projects are limited.

At what point citizens can participate? (Before, during the process, afterwards)

City council of Eskisehir works properly to involve citizens in the decision-making processes. There is a high participation rate of citizens in reflecting the ideas towards any type of projects.

IZMIR

How many municipalities?

There are 30 municipalities in Izmir Province. 11 (Balcova, Bayrakli, Bornova, Buca, Cigli, Gaziemir, Guzelbahce, Karabaglar, Karsiyaka, Konak and Narlidere) out of them are central ones. Around 2.9 million people living in the province center. Around 70% of people in this province can get the smart city application services. The rest is utilizing the other type of municipal services.

How many smart projects?

Izmir greater municipality has three main smart city strategies: transport, environment and governance (See Appendix I.E). Izmir RDA has smart grid applications and smart transportation strategies for 2014-2023 periods.

What type of actors are involved in the projects?

Most noteworthy thing about Izmir is that it has a participation culture embedded in the province. A formal Smart City Platform is initiated in order to have a reciprocal policy making process. From NGOs to citizens to formal bodies of public sector are involved in the decision-making process.

DENIZLI

How many municipalities?

There are 19 municipalities in total in Denizli province. 2 (Merkezefendi and Pamukkale) out of them are central ones. Around 600.000 people living in the province center. Around 60% of people in this province can get the smart city application services. The rest is utilizing the other type of municipal services.

How many smart projects?

Greater municipality has multiple smart strategies such as transport, water management, information, environment, energy and smart applications (See Appendix I.F). Denizli RDA (GEKA) has smart production, smart urban applications (constributing to social welfare), smart transportation (cycling etc.), smart city automation system (GIS) strategies for 2014-2023 periods.

At what point citizens can participate? (Before, during the process, afterwards)

In the smart city Denizli website, each smart city project is analyzed according to both merits and demerits. It gives citizens the opportunity to reflect on the each application via e-mail or phone.

ANTALYA

How many municipalities?

There are 19 municipalities in total in Antalya province. 3 (Kepez, Muratpasa and Konyaalti) out of them are central ones. Around 1.2 million people living in the province center. Half of the population in this province can get the smart city application services. The rest is utilizing the other type of municipal services.

How many smart projects?

Greater municipality introduces mobile applications as smart city practice and various other types of activities (See Appendix I.G).

ADANA

How many municipalities?

There are 16 municipalities in Adana province. 5 (Cukurova, Saricam, Seyhan, Karaisali, and Yuregir) out of 16 of them are central ones. Around 1.8 million people living in the province center. 80% of people in this province can get the smart city application services. The rest is utilizing the other type of municipal services.

How many smart projects?

Greater municipality introduces mobile applications as smart city practice (See Appendix I.H). Adana RDA (CKA) has smart architecture strategies for 2014-2023 periods.

5.2 Cases from Slovakia

BRATISLAVA SMART CITY STRATEGY

Bratislava as the capital city and the largest city in Slovakia with population of around 430,000 citizens (however it is estimated that more than 600,000 people are daily present in the city) and is located in the Vienna-Bratislava metropolitan region, statistically one of the most affluent regions in the EU. In September 2018 the city council endorsed the strategic document 'Bratislava Smart City 2030' after long process of document preparation since 2016 (Bratislava's twin city Vienna prepared the first framework strategy in 2014).

Bratislava smart city strategy is built upon three key words/areas of interest – environment, prosperity and participation (in Slovak language all start with letter 'p' so its 3P strategy) and 12 key action areas are selected: (1) City governance; (2) Mobility; (3) Energy; (4) Environment; (5) Circular economy; (6) Entrepreneurship; (7) Public space; (8) Social inclusion; (9) Education; (10) Culture; (11) Tourism; and (12) Sport (Bratislava, 2018). Each activity consists of specific objectives, measurable indicators and planned measures for achieving the objectives. The strategy is relatively well-rounded, covering main areas of city life and its duties given by law and is aimed at improving the quality of life. Interestingly, very little emphasis is placed on technologies and 'intelligence', but it is focused rather on data and monitoring.

From the point of view of the implementation, one chapter is dedicated to a roadmap with pilot actions split into three parts – 2018-2020 (organization arrangements, key pilot activities, progress evaluation), 2021-2025 (preparation and implementation of other activities, evaluation of objective for year 2025), 2026-2030 (preparation and implementation of other activities, evaluation of objective for year 2030). No more details are provided in this crucial part and it seems it was supposed to be a task for the next document and cooperation with citizens and private sector.

When we take a look at the implemented measures, the only physical result until 2019 is construction of

28 smart benches (Steora smart bench and Steora Urban+) which are solar powered, provide charging option via USB port, offer free Wi-Fi connection and on the side they are equipped with LED information panels.

Nevertheless, since the end of 2018 the city of Bratislava has a new mayor and a new city government and in their agenda they are not using the term smart city. There seems to be very little continuity in the development and implementation of the Bratislava Smart City 2030 strategy. Although the strategy is complex and comprehensive, at least in the sections dedicated to objectives and pilot actions with under-developed roadmap, the political support for it is rather low.

The new mayor had prepared a complex plan for the city of Bratislava with fewer 'buzzwords' (smart, modern, circular economy, competitiveness etc.) and has a strong support in the city council and district councils. Although they do not use the word 'smart', they are aiming at dealing with day-to-day problems of the city (parking, public transport, public spaces). These areas are not the primary focus of the smart city concept from 1990s and 2000s, but in the past years the concept of smart city is re-defined into liveable, sustainable city and city with high quality of life.

NITRA SMART CITY STRATEGY

Nitra is a city of roughly 78,000 inhabitants located in the western part of Slovakia, about 100km from the capital city. It is the capital city of the Nitra region and a center of culture, economy, church and sport of the region. It is an economically viable city with a large foreign investment of British automobile concern Jaguar-Land Rover which is planning to employ up to 2,200 people by the end of 2020 and the annual production should reach 150,000 produced cars. The latter investment was arguably one of the reasons why the reasons why the city experiences a vivid growth since 2018 until when there was a steep decline in population.

The city of Nitra is a self-entitled 'First Smart City in Slovakia'. It presented its smart city strategy in 2016 and is built on four key principles: (1) human/social capital investments; (2) infrastructure (transportation, ICT) investments; (3) intelligent energy management; and (4) use of modern technologies and solutions (Nitra, 2017). The vision is to ensure sustainable growth and high quality of life of the citizens and there are four objectives to safeguard the vision: (1) urban mobility; (2) quality of life; (3) intelligent energy; and (4) energy management.

When we look at the implemented solutions until 2019, we can find the following solutions – bike sharing and car sharing, LED lighting and 'smart benches' (solar powered benches in public spaces where users can charge their phone; price of 6 benches was 20,607 EUR) (Nitra, 2019).

From the governance point of view, the city of Nitra launched e-government platform offering 154 electronic services to citizens (Borotova, 2019) aimed at lessening the burden on citizens and enabling bureaucratic procedures to be dealt with without the need to physically go to the public offices. However, it is difficult to talk about multilateral form of communication leading to partnership among the public and private sector and the citizens, nevertheless it remains a one-way communication either from citizens to be city or vice versa.

There is rather a discrepancy between the objectives of the smart city strategy claiming it perceives smart city as sustainable, growth-oriented strategy aimed at improving the quality of life of citizens focusing on the social capital and comprehensive energy management, while on the other hand the smart solutions are all aimed at deployment of ICT solutions and small pilot projects of bike and car sharing. Secondly, complex and comprehensive smart city strategy with roadmap and clear activities and time schedules is absent and until today its preparation was not launched (Borotova, 2019). Thirdly, the coordination of smart

city initiative and activities is spread among the existing city departments without specific department managing the strategy, its implementation and monitoring. It appears the concept of smart city was used more in its external dimension as a marketing concept rather than genuine effort aimed at more efficient city operation deliberately utilizing ICT to improve the quality of life of its residents. Lastly, effective communication platform among the citizens, the city and the private sector to foster one of the key principles of smart city and spatial development in general – partnership built on understanding, trust and enabling.

6. DISCUSSION

On the one hand, Turkey is a big market for newly established smart city projects. For instance, the megacity of Istanbul has a share 31% of Turkey's GDP and is striving to expand its economic base with megaprojects such as the new airport or the third bridge over Bosporus. With a strong ole of the public sector it is natural that concepts such as smart city are used as a tool for development, as a marketing tool to its citizens and to awe the foreigners (investors, tourists). On the other hand, this capacity does not necessarily provide for the participation from citizens to other parties different than government or private sector. This is a considerable problem for the implementation and acceptance of smart city interventions as the number of beneficiaries is limited and profits are shared with narrow group of individuals. It might not be named as not an inclusive process leading to partnership between the public and private sector with strong role of civic society.

Most projects which are grouped as smart city projects do not necessarily correspond to the necessities of smart city structure as mentioned at the beginning of the paper. With the explanations from examples, it can be seen that mainly transportation is expected to be "smarten" in the first place. Focus on transportation and its smartening focuses almost exclusively on the technological part of smart cities, i.e. deployment of technologies into the urban fabric for the sake of technologies and investments rather than actual need of cities in terms of their efficiency and use of resources as well as a tool for city marketing. 'Smart' is becoming new 'eco' or 'green' meaning an idea the politicians cannot be against, everyone wants his/her city to be eco, green or smart, keeping up with global trends. This is even more pronounced in the countries of the 'global south' which are in the developing phase striving for more domestic and foreign, public and private investment (see India's goal of 100 smart cities, Chinese urban megaprojects, Songdo in South Korea and many others). However, infusing the intelligence into each subsystem of a city, one by one—transportation, energy, education, health care, buildings, physical infrastructure, food, water, public safety, etc.—is not enough to become a smarter city (cf. part 2.2 of the paper). In this respect, the definition of 'smart' remains in its roots from 20 years ago when writers and visionaries were impressed by immense development of technology and its potential to arguable improve lives of people and the nature of working, living and leisure. A smarter city should be treated as an organic whole—as a network, as a linked system (Kanter and Litow, 2009).

In Turkish cases, there is a clear distinction between smart applications between province centers and rest of the rural areas of the provinces. In some cases, smart irrigation systems are introduced. But these do not have a bigger share in the pie. There has to be an improvement in the environmental smart practices in order to deal with this blank space in policy making. The answer for these issues is not always high-tech solution. The work of Ostroms and the Ostromian framework on common pool resources provides often simple yet effective tools underlined by evidence from hundreds of irrigation systems from all over the world built on cooperation and adhering to simple rules which are followed by participants (individuals, institutions, urban areas). Additionally, this gap between beneficiaries is rather striking and it is further opening the scissors of inequality in the society.

In Slovakia, the idea of smart city is rather a new concept, too, used by politicians and city marketers as something new, something universal, something that is trendy and necessary. The cases presented above provide clues about different interpretation of 'smart', at least in the elaborated strategic documents, with quality of life in the spotlight. The strategies focus on efficiency (transport, energy), high quality public spaces, good living conditions, however, when looking at the implemented solutions, these are nearly purely of technological character and are used to show off the pilot projects with little effect on citizens (e.g. the smart benches). In Nitra example, this was the case when the strategy was gracefully introduced with resonating plans, but after 4 years smart city remains mostly in form of car/bike sharing and smart benches.

Another crucial aspect is the political support at the regional and municipal level. In Bratislava case the change of political representation gave farewell to the Bratislava Smart City 2030 strategy and measures did not obtain further support (political, financial) and the focus was shifted to other priorities. The new priorities, though, are not anti-smart, but they avoid using the term 'smart'. In Bratislava, 'smart city' ideas remains in the projects without using the word 'smart'.

So far, these practical cases show that practice of smart cities does not necessarily create smarter cities in terms of our definition above. When the smart city applications in Turkey and Slovakia are evaluated, compared to the practices world-wide, it can be specified that these are quite new and immature (Bilici and Babahanoglu, 2018) and that there is still long road to catch up with the rest of the world in planning of sustainable and smart cities and be part of debates of how smart city is understood in 21st century. Not in all cases is there enough information to compare the cases with the other. It is even interesting to notice the available smart city resources are very limited for some of the cities. Based on difficulties with information gathering there arises the question about availability and accessibility of data on smart cities, especially in Turkey, for citizens to get informed about what the city is doing and how it can be used or changed. Some parts need more elaboration within the light of new information in the future smart city initiatives and policies in Turkey. In Slovakia, there is rather problem with low capacity of local governments, also linked to underfinancing, and general lack of information due to their non-existence and cities being re-active to problems as opposed to actively and continuously developing solutions, strategies and systems for effective and efficient governance.

7. CONCLUSION

In conclusion, apart from the different practices and approaches from both sides of these countries, there arises a mutual problem - to what extent smart city body of literature corresponds to the real life practices. The actors that are involved in the realization of the "smartest" cities recently tend to be reluctant to see the facts about this concept. The human factor is disregarded in terms of inclusiveness of the citizens who are affected by each decision on the city whether it is smart or not. Concepts tend to expire and the new ones are to replace the old ones. Nevertheless, the basic needs of human and the approach to different development levels are to remain the same.

ACKNOWLEDGEMENTS

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