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SMART CITY CONCEPT IN THE STRATEGIC URBAN PLANNING PROCESS. CASE STUDY OF THE CITY OF BELGRADE, SERBIA

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ABSTRACT

European regions and cities intensively apply the Smart City concept, pursuing to maximize the use of contemporary technologies and Internet of Things (IoT) in problem solving when it comes to transport, city logistics, environmental improvement, life quality for their citizens, and many other aspects. This concept has been elaborated through smart city strategies dealing specifically with the topics such as smart governance, smart economy, smart environment, smart living, smart people, and smart mobility, but often also as a part of comprehensive urban development strategies. In the case of the City of Belgrade, the Smart City concept has been introduced through several strategic development documents (e.g. City of Belgrade Development Strategy 2017-2021). The aim of this paper is to identify the future long-term development vision rooted in the Belgrade's most recent strategic documents, by detecting the parts that lay fertile ground for innovation and entrepreneurial culture, inherent elements of the Smart City model. This approach should reveal the city development domains that are the first to encompass innovations in strategic planning and enable the introduction of the Smart City concept on a larger scale. Having in mind that holistic approaches to urban development and resilience and global knowledge-based platforms can lead to important achievements for the future of the cities, it is also important to make, at this point, some useful links between Belgrade and other comparable and innovative European cities. For the purpose of making comparison between the City of Belgrade and advanced European cities of similar demographic and urban features (e.g. Barcelona, Vienna etc.) topics such as development of transparency in decision-making, or improved stakeholders' participation and collaboration in service provision, will be used to demonstrate the existing gap between them, as well as to point out the direction on which Belgrade should embark on.

Keywords: Smart City, strategic planning, City of Belgrade, sustainable community, innovation

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INTRODUCTION

Generally speaking, principles such as innovativeness, transparency, public participation, competitiveness and information accessibility are advocated by major strategies in Serbia that relate to the smart city concept – Strategy of Electronic Communications Development in the Republic of Serbia for the period 2010-2020 (2010), Strategy and Policy of the Industrial Development of the Republic of Serbia for the period 2011–2020 (2011), Public Administration Reform Strategy in the Republic of Serbia (2014), Strategy for Supporting the Development of Small and Medium Enterprises, Entrepreneurship and Competitiveness for the period 2015-2020 (2015), Strategy for e-Government Development of the Republic of Serbia by 2018 (2015) and Strategy for Development of IT Industries 2017–2020 (2016). Although not specifically addressing the smart city concept, all above mentioned documents strive to follow EU regulations and improve life quality of all citizens. Listed principles, according to those documents, should be applied through investment in and use of electronic communications in various sectors – medicine, health care system, governance, education, traffic management, etc. Besides service provision, electronic communications should secure public participation in decision-making, stakeholders' accessibility to information, but also a communication infrastructure between governmental bodies e.g. online meetings and work from home saving time and reducing transportation costs and pollution. These strategic documents advocate: rationalisation of government bodies, simplification of administrative procedures, trainings of government employees and life-long learning, and innovative entrepreneurship in relation to the smart city concept. Also, particular attention is given to science-technology-investor system and its strengthening by establishment and investing in science technological parks, technological incubators and a national technological platform. The industry that relies on IT should also involve and stimulate development and small and middle enterprises and entrepreneurial spirit, especially with local ideas and capital.

SMART CITY CONCEPT IN THE BELGRADE DEVELOPMENT STRATEGY 2017–2021

A major ambition of the Belgrade Development Strategy [BDS] is to fit to European development priorities and principles, thus inclusion of the smart city concept represents one of its innovations. The vision of the City of Belgrade is competitive, sustainable and smart city devoted to life quality improvement for its citizens, what is generally planned through minimal waste of resources and maximal use of ICT (Damjanović et al, 2016). One of the main objectives is smart governance that provides good quality, efficient and effective service provision to all users. Furthermore, transparency, user participation, involvement of all stakeholders, direct communication between government and citizens and an early involvement of public in planning processes permeate priorities and measures set for the future five years of implementation.

Smart governance and participatory decision-making in BDS

What is to make economic development smart is aspiration to base it on knowledge and to stimulate innovativeness. In order to empower the knowledge, BDS supports a continuous development of human resources that can further improve competitiveness through specialization of attractive industrial branches with added value and through development of creative industries. Attraction of key enabling technologies is expected to help the process, which will also include building of partnerships between science and economy. Some of the proposed tools to achieve this are science technological parks, business incubators, centres of competence and electronic entrepreneurial platforms. Each tool is relevant, but science technological parks are of utmost value because they unite science, entrepreneurs, start-up businesses, innovation, self-employment and small and medium enterprises, which are integral part of the BDS priorities (Figure 1).
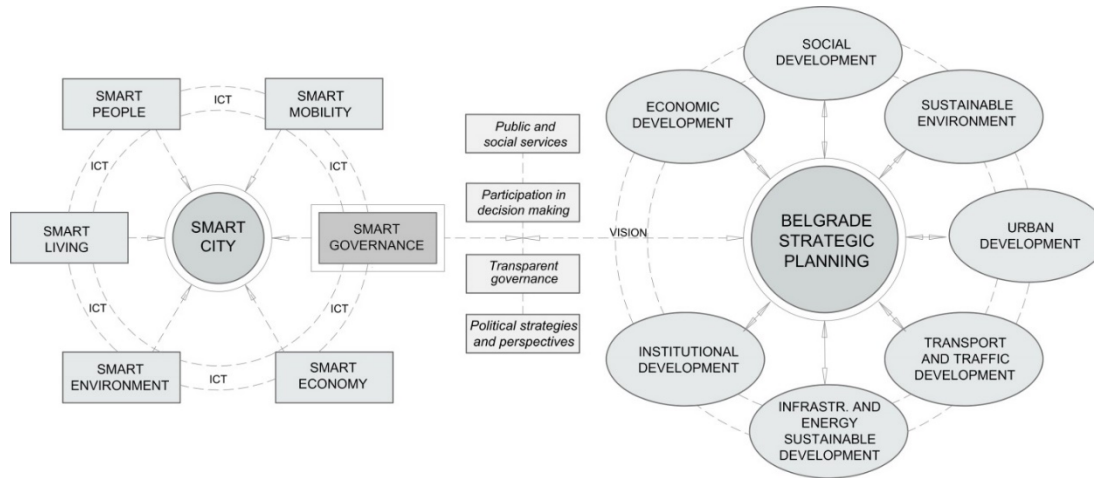

Figure 1: Model of smart governance within Belgrade strategic planning - Source: (Čolić Damjanović et al, 2016)

Urban development of Belgrade should be smart after urban development procedures are simplified, and the use of land relying on the principles of compactness and multi-functionality is made more efficient, consequently saving the space and rationalizing its use. The main objective is to open the city to its riverbanks – on the Sava and the Danube, but also to expand pedestrian zones in the city centre. A smart urban development strategy is planned as well as creation of urban GIS and technologically reliable centre for monitoring, coordination and decision-making that will empower citizens' involvement through e- communication. The smart way of getting financial support is intensification of public-private partnerships.

The main objective in traffic segment is sustainable mobility and shift in traffic modes hierarchy – first pedestrians, bikers and public transport, at the end car users. In order to make an user-friendly city, the BDS prescribes relocation of railway tracks spreading parallel to the river banks, continuous traffic and parking tracking systems, construction of tunnels in order to dislocate transit traffic from the city centre, construction of metro system, intensified construction of underground parking lots and a logistics centre. A planned smart plan for traffic infrastructure should tie all the elements up and make everyday life of citizens and visitors of Belgrade more comfortable.

Objectives in the segment of communal infrastructure are rather not ambitious because the current state needs significant improvement. Therefore, the BDS aims at getting closer to complete coverage of households by water supply and sewage system, by organized waste collection and primary waste selection. Enabling the city to be smarter with this respect means bringing service costs to economically sustainable level, therefore, transition to smart city requires not only technical and organizational measures, but also educational actions in order to prepare the households to new standards.

As successful management is the basis for all successful systems, energetics segment of the BDS puts an accent on tightening ecological regulations and introducing new institutes and positions such as energy management for city-owned buildings, fund for energy efficiency, information system on energetics, public-private partnerships and introduction of pay-per-use system. The system also should be improved by increasing the share of renewable energy sources, energy efficient technologies (e.g. heat pumps), etc.

Aiming at efficient response to climate change, the BDS advocates development of integral GIS (for water, air, soil, noise, etc.) combined with innovative monitoring system. Other measures in the segment of environmental protection and improvement relate to the projects for acoustic zoning and promotion of green roofs and vertical greenery in the city.

Social development segment appears to require major system changes in order to improve its availability to users. Steps recommended by the BDS are intersectoral cooperation, integrated user record system, housing fund database and improvement of accessibility to health care services. In addition, this segment requires awareness raising on relevance of recreational sports and regular physical activity, practically supported by free of charge open-space gyms in public spaces.

THE SMART CITY CONCEPT IN SOME EUROPEAN CITIES – BARCELONA, COPENHAGEN, VIENNA

Current status of the City of Belgrade within the local self-governance system does not correspond to its population size and significance; therefore, it is necessary to initiate certain legislation changes. The city municipalities of Belgrade do not have the status of local self-government units, even though they fulfil all necessary requirements for it.
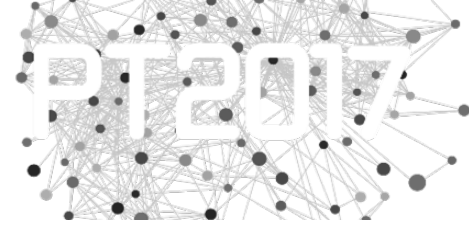
TOPIC III:
SUSTAINABLE COMMUNITIES AND PARTICIPATION

Some European cities, comparable to Belgrade by population size, like Barcelona, Copenhagen and Vienna have either a status of a region or other form of intermediate level of local government. If Belgrade gained the status of administrative region, its jurisdiction would expand significantly and Belgrade would transfer some of the current tasks to the city municipalities. Nonetheless, before City of Belgrade undergoes the decentralisation process, the BDS recommends creation of a body that would bring together representatives of all city municipalities and top city officials for shared planning, experience exchange and recommending modifications of the City Charter and other legal acts of the City.

The establishment of comprehensive e-government and participatory planning mechanisms, together with other innovative participation forms is one of the objectives stipulated in the BDS. In addition, smarter government is to be secured through creation of database of own and delegated tasks and introduction of more efficient land ownership management system.

Review of the European strategic documents for some European cities – Barcelona, Copenhagen and Vienna – that are similar to Belgrade in population size, leads to a conclusion that the smart city concept for these cities is based on environment and mobility. In order to fight climate change, these cities focus on massive reduction of CO_2 emissions, while transforming energy consumption and traffic into more sustainable patterns. Their sustainability goals do not concern only environment, but also users of the system – citizens and visitors (MD-UDP, 2014a; REM, 2015; CRD, undated). The smart city concept in these cities is assimilated in the overall objective of high quality of living, including greater social inclusion, innovative development and use of ICTs, and the resource use reduction.

Encouraging the sustainable mobility means development of efficient low emission transport systems, including minimization of travel time and travel speed. Hence, the mentioned cities work intensively on environmentally friendly public transportation modes. Cycling and walking, electric cars and car-sharing are being dynamically promoted while traffic is monitored and regulated in real time. For some of them the ambition is to become fossil free cities by 2050 (CRD, undated).

Energy consumption is being put under control by reinforced monitoring of environmental features. The smart city infrastructure (integrated digital systems) based on the use of up-to-date technology enables sensor monitoring of water, air, waste, weather and its influences on sewage system capacities, e.g. waste containers powered by solar cells that communicate when they should be emptied (MD-UDP, 2014a; CRD, undated; CCC, undated; Nielsen, undated). The key point is that monitoring data are integrated and optimized in real time. Further reductions in resource usage concern reuse and recycling, which reflect in separation of grey water, rainwater deposits and use of regenerated water (REM, 2015). Inevitable aspect is the education that promotes environmental initiatives and overall awareness raising, in accordance with goals such as keeping or achieving the share of green spaces at over 50% (MD-UDP, 2014b; REM, 2015).

Development of smart infrastructure requires new solutions and innovativeness. Therefore, the examined cities actively work on state-of-the-art urban technologies, their competitiveness and entrepreneurial spirit. Creating spaces where research, high-tech production and start-up entrepreneurs go together (science technology parks, business incubators, centres of excellence) help to specialize production, coordinate various stakeholders and bring added value (Vuja, Čolić Damjanović, 2013). Skilled employees are a prerequisite for innovation and successful SMEs, therefore, Barcelona, Copenhagen and Vienna pay attention to bringing together education and trainings, in line with acknowledged requirements.

Among shared principles, objectives and actions, each of the reviewed cities has its own specificities. Barcelona has determined its boundaries one century ago, used as incentive for smart space use, thus creating new urban centres within city territory and reducing travel time on long distances (REM, 2015). Copenhagen turned to be one of the most ambitious cities regarding climate change adaption. By aiming at severe reduction of CO_2 emission, they developed a "blue and green" concept to protect the city from the flooding by turning concrete and asphalt areas into canals and green micro parks (Barenholdt Bruun, 2014). It is also ambitious in recycling its waste in share of about 90%. Finally, Vienna is singular by the introduction of district heating systems where local waste produced in a district/neighbourhood is used for heating production (MD-UDP, 2014b).

Smart governance assessment

It is noted that the smart city governance of Barcelona, Copenhagen and Vienna is a shared concept relying on three pillars: (1) transparency (open data access and participation), (2) cooperation and partnerships, and (3) holistic urban planning. Transparency implies equity in the public access to aggregated data that concern urban development and inform citizens about action plans and projects implementation (REM, 2015; Nielsen, undated). It is also about open access to certain types of data for academic use in order to connect research and development. Participatory governance is practiced as a full involvement of citizens in the development of projects, involvement of different stakeholders, dialogue with politicians, local authorities, companies, research institutions and citizens. The City of Copenhagen believes that long-lasting tradition in implementing these practices "led the country to become the first in the world to pass an environmental protection law" (CRD, undated) and "to become one of the leading countries in the world when it comes to e-governance" (CCC, undated). Cooperation among different stakeholders is considered to be essential part of successful governance, especially between public and private partners. For Vienna, it is considered a central principle in urban development (MD-UDP, 2014a), while Barcelona focuses on cooperation among the municipalities in the metropolitan territory because that is the only way to strategically integrate systems that cannot be successful if developed along territorial limitations (REM, 2015). Finally, the holistic approach is traditionally practiced in Copenhagen and Vienna (CCC, undated; MD-UDP, 2014a), representing the most relevant component in the implementation of the smart city concept.
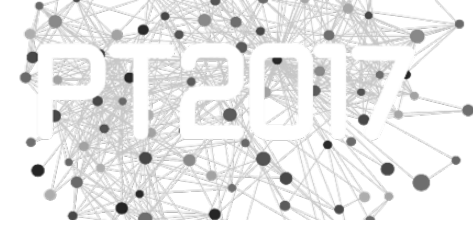
TOPIC III:
SUSTAINABLE COMMUNITIES AND PARTICIPATION

In order to enable practice of all three pillars of the smart city concept, the Cities of Barcelona, Copenhagen and Vienna have developed diverse tools. First of all, they assumed that development of e-governance can achieve its purpose only when almost all institutions and citizens are fully computerised, and educated to use ICTs and broadband services. Therefore, the smart growth includes broadband and comprehensive W-LAN (MD-UDP, 2014b; CRD undated) making available the use of social networks, data platforms or contact forums. Smart city strategies and urban plans can also be considered a tool to the concept implementation. Thus, Vienna has adopted the Smart City Wien Framework Strategy (MD-UDP, 2014b), while Barcelona is working on the establishment of a new model to address the management and urban planning conjointly with the social, economic and institutional actors involved (REM, 2015).

When compared to these reviewed cities, Belgrade is at a lower starting position. The completion of infrastructure that is considered elementary in other cities is currently a starting point for the smart development of Belgrade (connection of all households to the water supply and sewage system, waste-water purification system, organised waste collection for all citizens, reduction of coal and oil fuels in heating system, etc.). If current statistics and intended measures of some of the smart city criteria are compared, it is clear that Belgrade will need significantly longer time to achieve the standards: e.g. the expected rise of cycling in Belgrade is 2.8–5.8% by 2021, while the share of cyclists in Copenhagen is expected to be 50% by 2025. In Vienna, by 2025 80% of journeys will be made by public transport, cycling or walking. As Barcelona plans to reduce greenhouse gases by 40% by 2030 and introduce 70% hybrid vehicles by 2022, and as Vienna strives to reduce the emission of greenhouse gases by at least 35% by 2030 (and by 80% by 2050), Copenhagen and consequently Denmark have even higher ambitions of becoming the first carbon-neutral country in the world by 2050.

CONCLUSIONS

Frequent changes of the economic and environmental settings, as well as regional and global challenges, are imposing on urban planners and city authorities the adjustment of city strategies and making moves towards more efficient, more sustainable and transparent planning and urban management, also by introducing smart city concept. General principles and basic smart city concept in Serbian strategic urban planning processes are assessed in relation to the examples of other European cities of similar population size. Even though the smart city concept is reflected in each segment of the BDS, it seems that segments about traffic and energetics reflect it in the most comprehensive manner and regarding diversity of aspects for adaptation to the smart city approach and technological complexity of suggested measures. The significant lagging behind of the City of Belgrade is notable in the field of implementation because Serbia is still in the infrastructure building process of science technology parks, business incubators, introduction of early public hearings in urban planning, etc. However, the segment of environmental protection and improvement appears to be the least ambitious in bringing innovation and technologically challenging actions.

Another test for Serbia and the City of Belgrade is the process of extending technology education and empowering urban residents with low technology skills. Therefore, education and introduction of ICT trainings is necessary not only for users, but also for service providers. The future should bring direct communication among administration, decision-makers and citizens – direct debates via ICT in all phases of planning. While the present model mainly restrains citizens of Belgrade from participating in urban planning, and the results of introducing early public hearings are still ambiguous, citizens do need to be involved in decision-making by taking part in all phases of the creation of ideas and determining of goals.

By applying smart city concept to Belgrade strategic urban planning processes, key prerequisites are engendered for the improvement of economic results and for the advancement of effectiveness and efficiency in overall urban management system.

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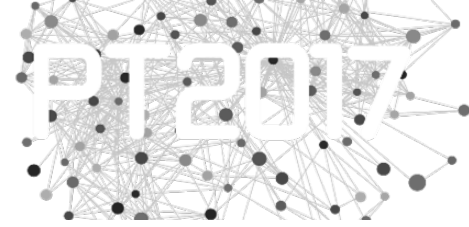Danish Smart Cities: Sustainable Living in an Urban World. Undated. Copenhagen Cleantech Cluster, Copenhagen.

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