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The role of infrastructure in the future city: theoretical perspective

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Abstract

Academic scholars agree that increasing urbanization and intensive technological progress raises new issues in urban development trends. This paper defines the characteristics of future city and analyses the specifics and role of infrastructure in it. Future city development is based no more on infrastructure growth but on its effectiveness and quality which may be achieved only by installing newest technologies and implementing strategic management.

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Keywords: Future city; city infrastructure; city competitiveness; sustainable development.

1. Introduction

Scientists highlight that the importance of cities is increasing in regional, national or global economy. Scholars also forecast that the influence will only be stronger in the nearest future. Since urbanization reached the level that almost half of the world's population lives in cities, city infrastructure faces real challenges how to deal with enlarged density of citizens. Even though scientists (Barrionuevo et al. 2012, Bruneckiene et. al. 2012) agree that urbanization process positively correlates with urban economic development indicators, increased use of electricity, big amounts of sewerage, lack of food, produced waste and pollution are real issues for government and local authorities. Technological progress allows improving production trends but it also plays important role in urban development. Barrionuevo et al. (2012) conclude that „failure to adapt to the new urban reality could be disastrous for cities facing unprecedented demographic, economic, social and environmental pressures". For this reason academic scholars started discussing about the future city which is innovating, knowledge-based and modern. Even

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though there are many researches about the impact of infrastructure on urban development, but scientific works still lack analysis on the specifics of future city infrastructure and its role for future city development. This justifies the actuality, timeliness and novelty of the problem analyzed in this paper.

The purpose of the paper is to distinguish the specifics of future city infrastructure and to present the critical aspects of the role of infrastructure for future city.

The methodology of the paper: systemic, comparative and logical analysis of scientific economic literature, the method of theoretical modeling.

Scientists started using different terms describing cities: digital, intelligent, ubiquitous, and smart or treat them generally as future cities. Digital city in scientific literature is understood as a city where newest computing technologies are used for critical services and infrastructure of a city: city management, work, housing, transportation, environment, leisure, health care, education, public safety. Authors (Komninos 2002, Kriščiūnas, Daugėlienė 2006) analyzing intelligent cities usually conclude that this type of city involves features of creative, learning and knowledge based city which focuses on creation of high skilled professionals, promotes research and innovation implementation in business, assures network building between education and business institutions. Nam and Pardo (2011) state that ubiquitous city with the help of newest computing technologies provides ubiquitous accessibility and infrastructure. Authors stress that the aim of ubiquitous city is „to create a built environment where any citizen can get any services anywhere and anytime through any devices". A team of researchers jointly leading the European Smart Cities project (www.smart-cities.eu), suggests that smart city implies innovative industries, has high educated, skilled and creative inhabitants, the relation between the city government and citizens is based threw the usage of new channels of communication for the citizens, e. g. „e-governance" or „e-democracy". Smart city is also known for the use of modern technology in everyday urban life: ICT, modern transport technologies, e. g. logistics and new transport systems.

Even though academic scholars use different terms for cities (smart, intelligent, etc.) they treat these cities as future cities. Authors of the paper chose the term „future city" on purpose in order to capture all possible features of a city not only for example digitality, ecology or economic prosperity. Compared with the concept of digital city or intelligent city, in future city the focus is not limited to the role of ICT infrastructure but mainly on the role of human capital/education, social and relational capital, and environmental issues. These are considered important drivers of urban growth (Lombardi et al 2011). Future city is also based on sustainable urban development principles which means that city aims for economic prosperity, social equity and environmental quality (Hasna 2012). The term „future city" evolves all spheres of city functioning: economic (regional, national competitiveness, international transactions, foreign investment), social (traditions, religions, culture, society), environmental (green energy, land use policy, pollution), institutional (administrative authority, transparency, e-government), human capital (talent, innovation, creativity, education). Technological and business oriented philosophy together with humane and ecologic elements allow future city develop as comfortable, safe, delightful, cultural, prosperous and friendly.

2. Results

The understanding of future city infrastructure becomes wide as it embodies not only physical urban infrastructure but also human capital, information and newest computing technologies (software, server and network infrastructures, devices of citizens or city visitors). The specific of future city infrastructure is that all city infrastructures are interconnected in order to provide high quality services. Barrionuevo et al (2012) state that urban development is possible only under these conditions: innovation (creative activities, participation of private sector, talent, technology), social cohesion (democratic values, health and safety, community spirit, diversity), sustainability (appropriate density, compact growth, energy efficiency, public spaces) and connectivity (efficient mobility, pedestrian friendly, communications, international connections). As one of the targets of future city is to create quality of living, social infrastructure plays important role too as it assures education process, health and security service provision, and formation of recreation and leisure zones in a city.

Washburn and Singhu (2010) distinguish seven critical contemporary city infrastructure components and services: city administration, education, healthcare, public safety, real estate, transportation, and utilities. Future city uses newest technologies in order to transform these infrastructure components for effective and quality service