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THE ROUTES OF DIGITALIZATION: A RUNAWAY CITY?

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Abstract. *We live in informatics society in which we are slowly, but certainly, reaching new limits of digitalization mainly using communication between people through different ICT networks: mobile phones, Facebook, social networks, etc. Today, entire Earth, regions, cities, settlements, etc. can be observed through Google. Data bases of every living person is being formed using possibilities to "track" every individual in space and time. Flows of financial capital are also being digitalized: individuals by using credit cards, on/line transactions, etc. and in banking systems global on-line transactions. Everyday goods such as food, clothing, etc. can be ordered through portals on the internet. Even various study courses and schools are being organized via internet.*

The real world (space, people, money, knowledge) are digitally being moved into virtual space. Here arises the question: To which space dimension is this process of digitalization taking us? This main research question will lead the paper discussion opening basic dilemmas: (1) Will real life slowly move to virtual world? (2) Is the dematerialization of spatial and urban systems reaching its limits? (3) Shall and what kind of usage we will have for virtual world? Especially in relation to city development, including the possibilities of estimating developmental options as well as in perceiving the effects of certain decisions in real life.

The main goal of the paper is to give answers to above disposed questions as well as to prove the thesis that we have a great range of influence and possibilities on the new meaning of urban development that is transforming into digital sphere, claiming that we will not have a runaway digital city, but the opposite: the city which digitalization will give a new meaning and possibilities for its re/creation.

Key words: *urban development, digital city, dematerialization, management*

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1. INTRODUCTION

Plural and global societies make crucial changes in thinking about urban development. Castells claims that we are now living in a "network society" that has new types of networks. This network is created by the process of globalization and spatial-temporal compression. Therefore, it is possible to experience different cultures, globally speeded, using multimedia, sitting in the own room. This kind of rapid cultural exchange brings together several levels of the globalisation process (economic, cultural, social, spatial, technological) that can have positive and negative impacts on urban development regarding the approach is used to tackle the process. (Castells, 2000) "Societies are organized around human processes structured by historically determined relationships of production, experience, and power. Production is the action of humankind on matter (nature) to appropriate it and transform it for its benefit by obtaining a product, consuming (unevenly) part of it, and accumulating surplus for investment, according to a variety of socially determined goals. Experience is the action of human subjects on themselves, determined by the interaction between their biological and cultural identities, and in relationship to their social and natural environment. It is constructed around the endless search for fulfilment of human needs and desires. Power is that relationship between human subjects which, on the basis of production and experience, imposes the will of some subjects upon others by the potential or actual use of violence, physical or symbolic. Institutions of society are built to enforce power relationships existing in each historical period, including the controls, limits, and social contracts achieved in the power struggles." (Castells 2000: 15) The paper will consider the possibilities to transform the real world into a digital one in a reversible process taking into account forming digital-eutopia as a paradigm to manage the future real life using various methods and techniques of generating alternatives, moving along them, and managing the future.

2. FROM REAL TO DIGITAL AND VICE VERSA: DIGITAL-EUTOPIA PARADIGM FOR METHAMORPHOSIS

We live in the era of generation, formation and establishment of an informatics civilisation that reflects, transforms and transcends all aspects of our culture especially of the urban one, enabling multilevel change and exchange of cultural practices and experiences globally providing rapid urbanisation process that is based on old and new kind of networks. The old one stands for traditional kind of organising, while the new one uses digital world for re/creating traditional life into all possibilities of individual, group, community desires. Therefore, we can realize our desires using digital networks, creating our virtual identities, monitoring our alter behaviour on other alter-ids/egos/superegos. Following this process we can create virtual/digital cities that transcendent all resources into virtual networks in which we act as a real persons for new utopias, we would say eutopias. For us digital city as digital-utopia can take two directions: dis-utopia and eutopia. The paper will discuss the processes that can reverse some material dis-utopias to eutopias and vise versa.

Firstly, we would like to distinguish the main notions that the paper is based on. For us: „Digital city refers to a set of virtual practices or repertoires that are undertaken in a sustainable manner by individual residents and groups of a particular city for the purpose of interacting, simulating, explaining, reinforcing, monitoring, neutralizing, criminalizing, expanding (locally or globally), processing, transacting, or undermining any political, social, economic, religious

or communicational aspect of the daily activities of the urban community. The digital city is an embodied site- the virtual facade of the modern city – where some aspects of social interaction and traditional daily activities are carried out and thereby transformed.“ (Laguerre, 2005:1) According to Laguerre this kind of city represents space into which real city expands in a form of another entity for various kinds of communication.

On the other hand Castells claims that modern area is characterized by network society in which we are all interconnected using diverse kinds of communication channels based on information technologies that creates bases for new types of social, cultural, urban, economic, financial societies (Castells, 2000). “Bewildered by the scale and scope of historical change, culture and thinking in our time often embrace a new millenarianism. Prophets of technology preach the new age, extrapolating to social trends and organization the barely understood logic of computers and DNA. Postmodern culture, and theory, indulges in celebrating the end of history, and, to some extent, the end of reason, giving up on our capacity to understand and make sense, even of nonsense. The implicit assumption is the acceptance of full individualization of behavior, and of society’s powerlessness over its destiny.” (Castells, 2000:4)

This kind of full avatar-individualization is provided by the network of hardware, software and people that all together represent a virtual society. According to Castells, a network society is different to previous ones regarding new sort of mutual relations. Each society is a society of networks. However, the contemporary network society has multilevel networks that are both horizontal and vertical, integrated into a dynamic model of nodes and relations that are virtual and real. We can say that the traditional society is characterized by normative and closed networks. On the other hand, the global society has open multidimensional networks that integrate all nodes and relations into creative networks for Landry’s creative city. This type of creative information society gives rise to different virtual societies that are a metamorphosis of the real one.

Mrđenović, Ralević, Đukić and Ivanović, claim that several relations between a digital and a creative city can be summarized:

A. A digital city is a kind of social network where each person can re-create identity,
B. A creative city uses possibilities of digital technologies (data usage, solving problems for contemporary life, transparency)
C. The digital city enables the creative one in a manner that includes all available resources,
D. The digital city, unlike the creative one, is unhuman,
E. The creative city has a specific contemporary identity that is formed by an artist, using technology and multimedia of the digital city,
F. The creative city is oriented towards the technology that is formed by creative people,
G. The digital and Creative cities are a form of free space in which everyone is engaged in activities they are best in. (Mrđenović, et al, 2015)

This relationship between the creative and the digital city is one of the crucial links for metamorphosis of real world into the virtual one and vice versa. If we rely on the previously mentioned statements the digital city re/creates the real one into the creative city. So, it can be said that the digital city is an instrument for this kind of transformation and evolution. Technology is just a tool that enables a new kind of communication through networks.

The fact that the informatics technology is and will dominate future conditions of urban and wider society is giving it following attributes:

- it will become the crucial artifact in observing, assessing and managing future development of human kind;
- it will generate all great advantages and disadvantages in influencing future morphogenesis of humans and their behavior, faith, values and mutual (dis)respect.

These attributes make this discussion relevant for considering the ways and directions of urban development. Lefebvre claims: „the modern field of inquiry known as epistemology has inherited and adopted the notion that the status of space is that of a 'mental thing' or 'mental place'….no limits at all have been set on the generalization of the concept of mental space: no clear account of it is ever given and, depending on the author one happens to be reading, it may connote logical coherence, practical consistency, self-regulation and the relations of the parts to the whole, the engendering of like by like in a set of places, the logic of container versus contents, and so on.“ (Lefebvre, 1991:3)

The space as a 'mental thing' is just an another way of seeing the virtual city and its creation through total individualization in network society, related to behavior, faith, values, etc. This mental space is reorganizing the 'real one' through a cognitive process where each individual is a creation of their own world, while with technological support the individualization becomes ‘a real virtual thing' which is communicating with another virtuality, creating a special kind of the digital city where the number of inhabitants depends on the preference to become a member. On the other hand, the network has its own rules that are inherited from the traditional networks, frankly we cannot escape our genotype behavior. Here we challenge main Giddens-s question on new kind of risks we are creating: Do we?

Giddens claims that we live in runaway world in which we are facing new kind of risks that are provided by us, so called manufactured risk, unlike external risk: „External risk is risk experienced as coming from outside, from the fixities of tradition or nature. I want to distinguish this from manufactured risk, by which I mean risk created by the very impact of our developing knowledge upon the world. Manufactured risk refers to risk situations which we have very little historical experience of confronting, such as those connected with global warming … we started (for ex.) worrying less about what nature can do to us, and more what we have done to nature“ (Giddens, 2000:5) Also, he believes that:“The more science and technology intrude into our lives, and do so on a global level, the less this perspective holds. Most of us – including government authorities and politicians – have, and have to have, a much more active or engaged relationship with science and technology than used to be case.“ (Giddens, 2000:49).

So, we can conclude here that new kind of social organization, including information and network society, different from the traditional one, provided a new kind of risks we have to manage in urban and territorial life, and to do so we must manage technology and digital society to work for our risks. This sounds paradoxical, but true, the technology we created formed new networks that present a manufactured risk in which we have to use technology and science to manage it: some kind of meta-technology or meta-society – a kind of a paradigmatic model.

Therefore, the digital city can be “hell” or “purgatory” for re/cycling and re/creation values for new principles of spatial and cultural organization, as well as 'mental space'.

The main characteristic of the informatics technology is a process of digitalization through which we can, desire and want to project, translate and overwrite the real world into the digital/virtual one, creating a kind of a model/paradigmatic copy (e/eutopia) in which we can efficiently and effectively decide on the effects in the real world that we face, using different techniques of simulation: mathematic, visual, logic, etc. (Fig. 1).

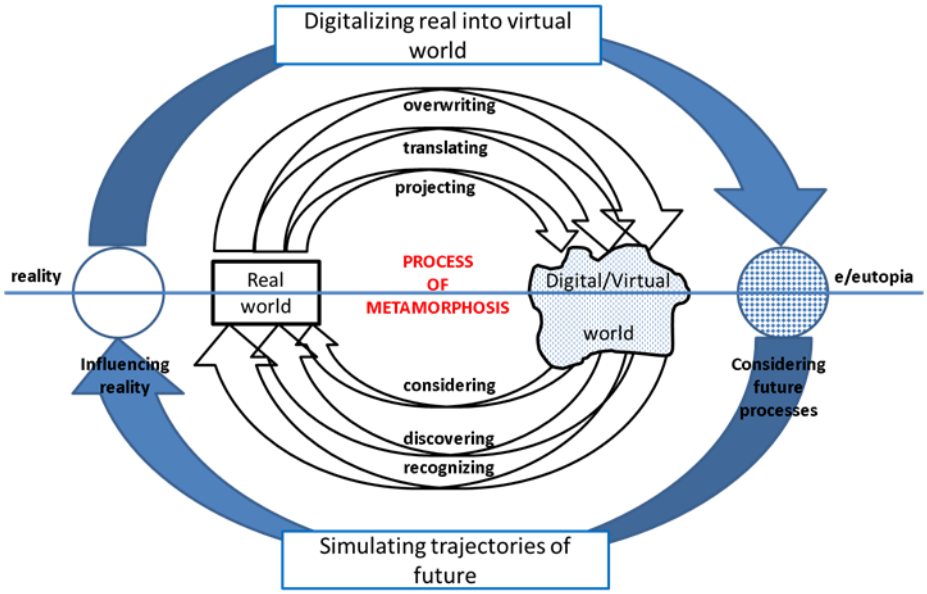

Fig. 1 Relation between the process of digitalization and simulation: metamorphosis of real and virtual, authors

This kind of paradigmatic model steers to define rules of rewriting the real into the digital and vice versa in order to re-create and manage the ‘real world’ and 'manufactured risk' using the creative networks of the digital one. These rules should be based on the developmental social capital that pulls society to a better, sustainable future. The developmental social capital incrementally transforms the traditional networks into new ones that are able to tackle the manufactured risks. In the area of socio-centric theory of rhe social capital there are various thoughts about the purpose of the network and groundings they are built on. Closed theories are based on the social norms that are practiced in a community. This means that the social practice is constant and traditional. On the other hand the developmental are open and include both traditional and new values in the social practice. Both kinds of theories can have positive or negative externalities towards environment regarding the values they promote. For this research relevant thoughts on social capital are those that consider development of the network. This type is promoted by Woolcock and his three levels of social capital. They are namely: binding, linking and building partnerships (Woolcock, 2003).

3. ROUTES AND PRODUCTS OF DIGITALIZATION PROCESS: DEVELOPMENT OVER TIME

In line with the thesis outlined in the Introduction that is presented in the Fig. 1 the core of the research will discuss, systematize and present the "finite" products of digitalization considering Castells thesis: "…are the virtual communities real communities? Yes and no. They are communities, but not physical ones, and they do not follow the same patterns of communication and interaction as the physical communities do. But they are not "unreal," they work in a different plane of reality. They are interpersonal social networks, most of them based on weak ties, highly diversified and specialized, still able to generate reciprocity and support by the dynamics of sustained interaction. As Wellman puts it, they are not imitations of other forms of life, they have their own dynamics: the Net is the Net. They transcend distance, at low cost, they are usually of asynchronous nature, they combine the fast dissemination of mass media with the pervasiveness of personal communication, and they allow multiple memberships in partial communities. Besides, they do not exist in isolation of other forms of sociability. They reinforce the trend toward the "privatization of sociability" - that is, the rebuilding of social networks around the individual, the development of personal communities, both physically and on-line…" (Castells, 2000:389)

These "finite" products of digitalisation will be especially considered in the area of professional action in urban, spatial development of cities, regions, settlements considering "urban" and "spatial" level as a core of real as well digital world. The process of mirroring real to digital and vice versa is instrumentalized by the process of digitalization and metamorphosis (Figure 1). In this sense we will systematize and present the steps and phases of the digitalization process of urban systems and its effects on urban activities and development. The systematization is in line with two antipode paradigms in urban and spatial development when creating places: positivistic rational, and collaborative-rational.

Our paradigmatic model is the one which should widen the H. Simon's bounded positivistic rationality using multilevel dimensions of a digital city and space to widen and integrate different legitimate rationalities, alter-individuals into coherent shared values and visions of future to manage manufactured risks using the digital city. Therefore, the digital and real space: "… becomes as an arena for mediating differences in plural society. This integration means making linkages not only between the sectors of sustainability and different interests, but also linkages between different levels of governance, both horizontal and vertical." (Mrđenović, Ralević, 2013). This arena went through various steps and phases of digitalization:

- "0 step/level" – Zero step is the beginning of digitalization and informatics society in which the discovery of binary code 0,1 as a digital resource, has made a revolutionary thought of mathematics-operational systems when the hardware became a virtual place of binary reality of the real urban world;
- "1 step/level" – First step of digitalization of urban space works on the basis of entering infinite number of data about space, demography, physical structure, into alpha-numeric data-basis on multilevel urban and spatial systems, when professionals form data-bases for assessing present states in and about the world in order to rise a level of implementation of developmental trajectories and options (Figure 2);

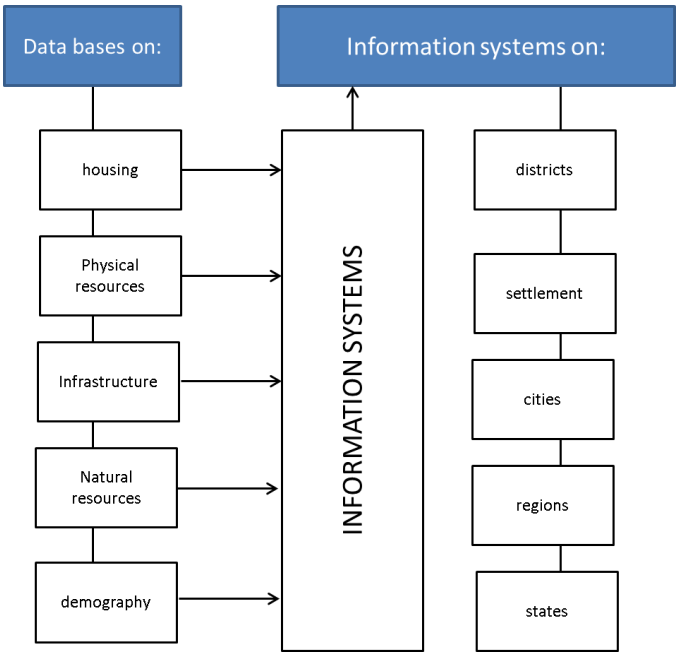

Fig 2 Digitalization – Information systems

- "Second step/level": process of mathematisation of digital space - considers introducing computing techniques that enable efficient work with quantitative data, systematizing them into different categories with relational data bases that produce diagrams of change over time. This is enabled by complex mathematical models: from relational-functional connections to programmed mathematical models (Figure 3);

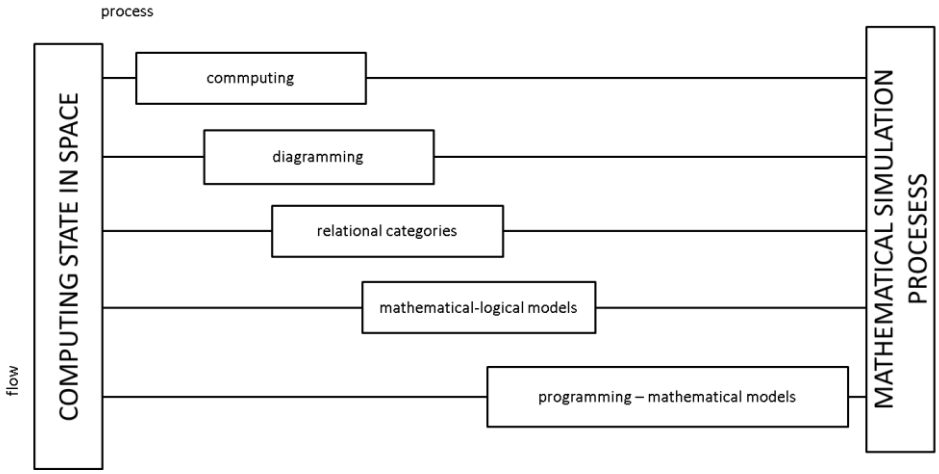

Fig. 3 Digitalization – Process of mathematization of digital space

- "Third step/level": Visual digitalization of space, represents a leap for our profession as we got a possibility of graphic spatial representation that is provided through: (1) Satellite imagery,(2) Otho-photo imagery, (3) Digital mapping of geo-referral cadaster, (4) "Google – earth GIS" system that integrated various levels of space (Images 1,2,3,4):

– Geo-morphology

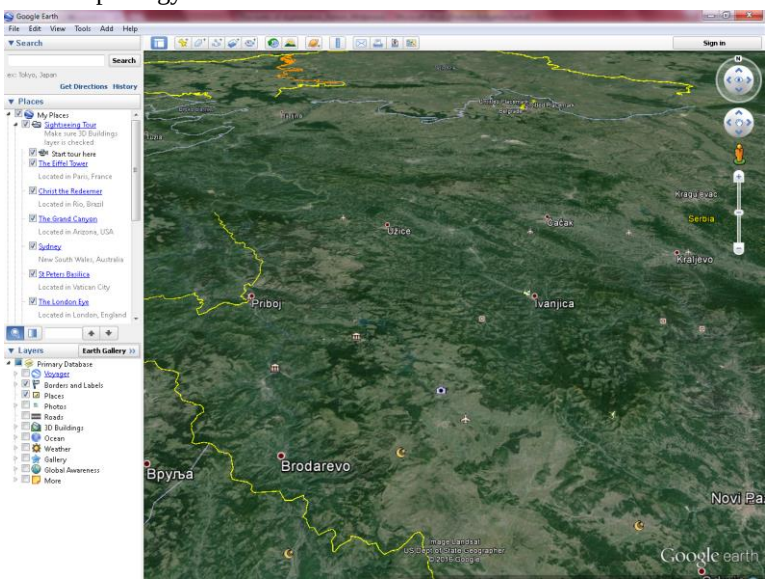

Image 1: Geo-morphology in Google Earth

– Urban maps

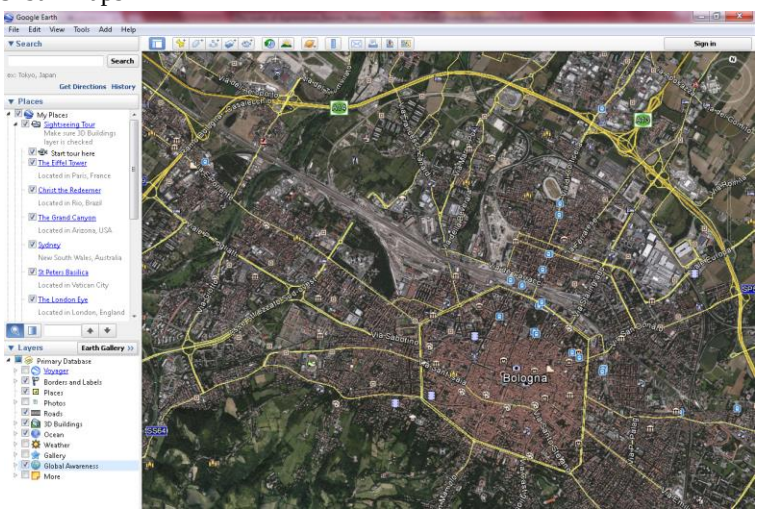

Image 2: Urban Maps in Google Earth

– Physical representations

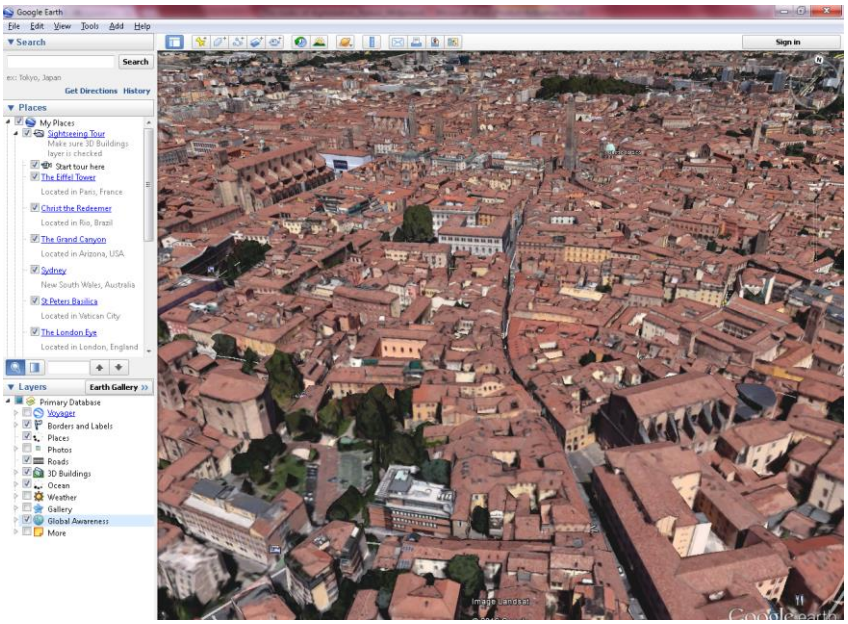

Image 3: Physical representations in Google Earth

– Virtual walk through space

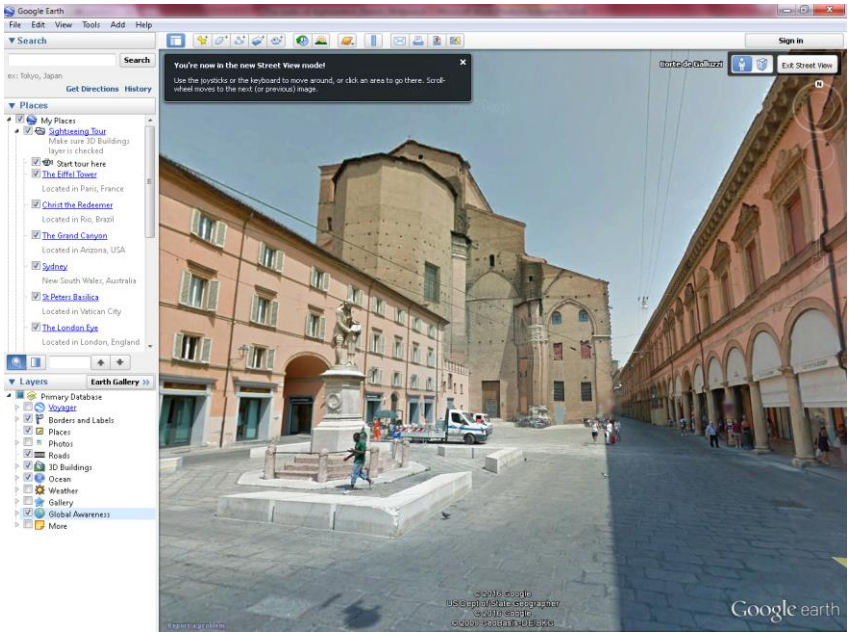

Image 4: Virtual walk through space in Google Earth

- "Fifth step/level": Geo-spatial digitalization of simulation models of complex visual, geo-spatial, alphanumeric data, and value representation in order to support decision making towards adequate transformations on regional and urban levels: (1) simulation games in real space, (2) simulation games in virtual spaces, (3) Simulation models of city development from various aspects;
- "Sixth step/level": What if - Digitalization of animation virtual models about real spaces and generating alternatives based on predictions with the cause-effect analysis on all aspects of urban and spatial development with an aim of continual assessment of our decisions about space (Figure 4)

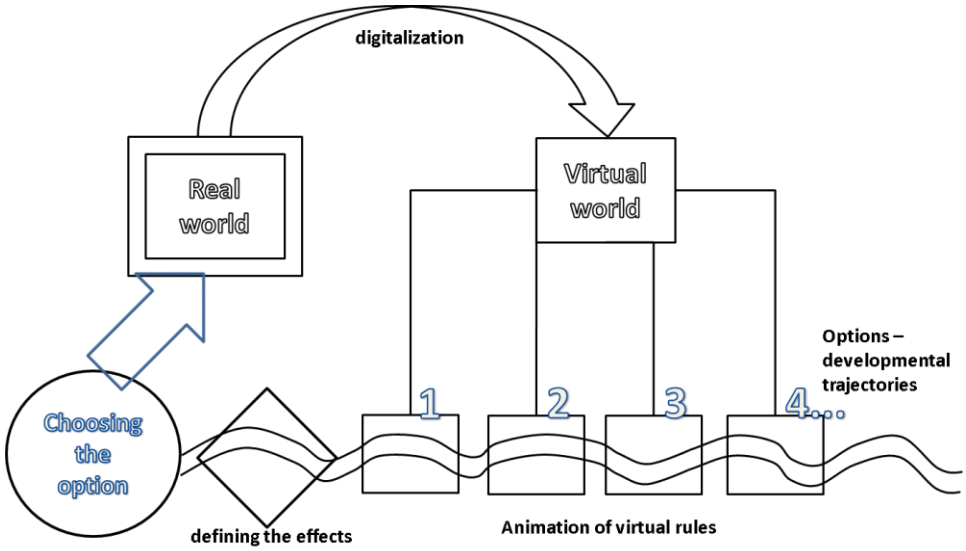

Fig. 4 What if digitalization in order to manage the actions with cause-effect assesment

- "Seventh step/level": Represents transferring social communications between people into digital world through Facebook, Twitter, etc. creating a special kinds of virtual societies that become real entities that influence real world and behaviors;
- "Eight step/level": Personal blogs, web-sites through which individuals, institutions, organizations, companies, promotes their offers, results, programmes, etc.

4. CONCLUSIONS

At this specific moment taking into account previous discussion we can conclude that the real world is "moving" to the virtual one, creating a specific digital city in order to efficiently and effectively manage needs, desires, interests and values, using all benefits of digitalization process:

1. Efficient reaction and feed-back;
2. Easy accessibility and constant presence of all resources (human, natural, artificial, financial, logistic, etc.)
3. Great interconnectivity of all actors, stakeholders and spatial systems;
4. Full time-based inter-connectivity of all actors;
5. Transparency and accessibility of all real resources using the digital world and upgrading the real one using digital society;

This tendency of metamorphosing real into digital is rapidly developing and forming a kind of digital utopia which should be re-evaluated by rational-positivistic and instrumental values in order to become digital-eutopia instead of digital-disutopia. On the other hand, digital-eutopia represents a kind of paradigm to be achieved using different techniques of simulation, animation, that enables us to change our behavior in real space-city to achieve agreed, shared and integrated values, and manage urban and spatial development using the digital city considering cause-effects of our actions and choosing the right developmental option at the time (Figure 5).

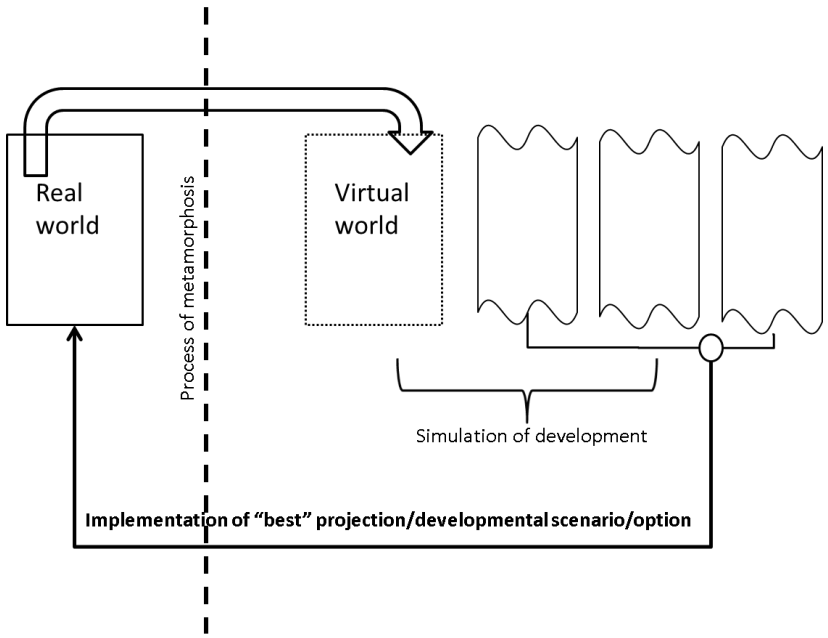

Fig. 5 Process of reversal metamorphosis of real into virtual worlds and vice versa in order to choose the "right" scenario at the time

Considering the question of re-discovering future of the cities the creation of „digital real one“ we are in the positivistic situation which opens up possibilities to:

1. Establish a range of alternative trajectories of real world (Figure 6) (Ralević, 2006);

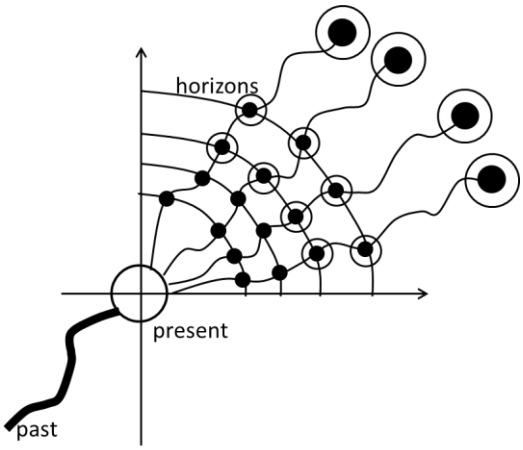

Fig. 6 Establishing a range of alternatives

2. Consider and evaluate future through wide ranges of alternatives in digital world (Figure 7) (Ralević, 2006);

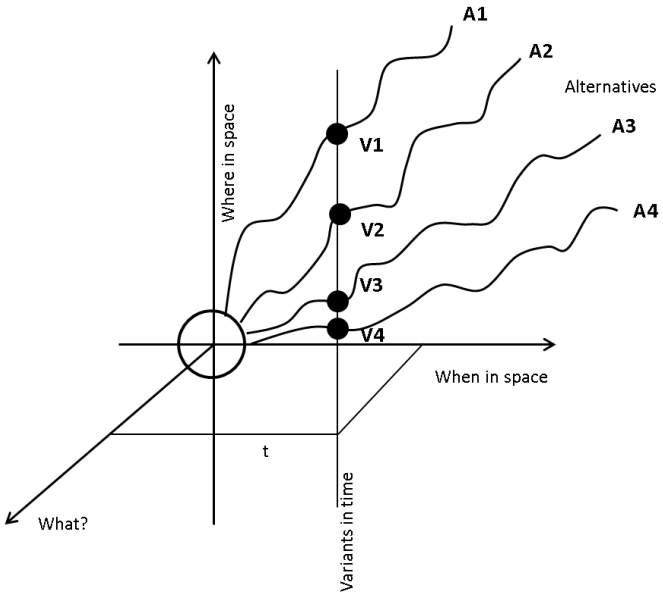

Fig. 7 Evaluating alternatives

3. Following the trends of new needs, desires and interests, we would be able to move along the alternatives (Figure 8) (Ralević, 2006);

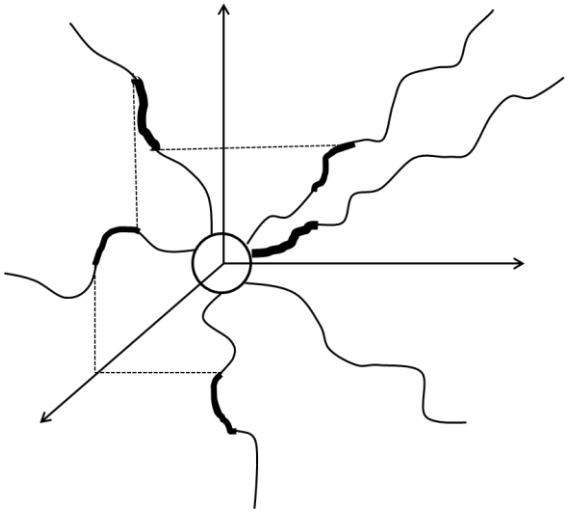

Fig 8 Moving along the alternatives

4. Take the future "in our hands" managing the movements along the alternatives instrumentally and particular (Figure 9) (Ralević, 2006).

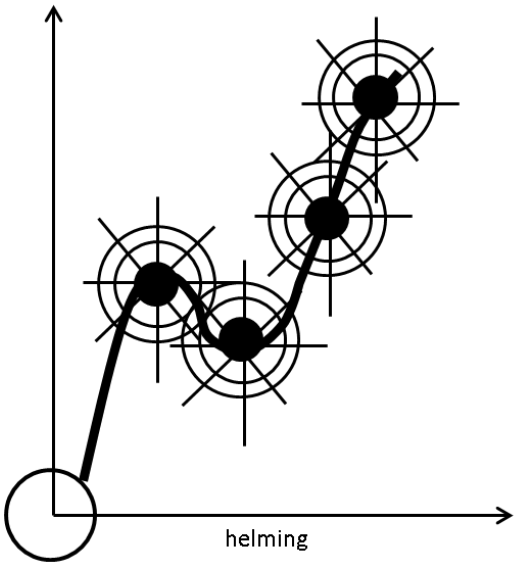

Fig. 9 Helming

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TRAJEKTORIJE DIGITALIZACIJE: ODBEGLI GRAD?

Živimo u informatičkom društvu u kojem se polako, ali sigurno krećemo ka digitalizaciji stvarnog života u svim njegovim aspektima, zasnovanoj na dimenziji funkcionisanja svih oblika komunikacije među ljudima putem različitih mreža: Mobilni telefoni, Facebook, društvene mreže, gugl eart, itd. Prostorna dimenzija svakog entiteta: regiona, gradova, naselja… se može pratiti kroz gugl. Baza podataka o pojedinačnim entitetima, uključujući i ljudske resurse, se formira u odnosu sa njihovim stacionarnim karakteristikama, ali i u vezi sa mogućnostima njihovog "praćenja", u prostoru i vremenu.

Tokovi finansijskog kapitala su takođe digitalizovani kako za svakog pojedinca (koristeći kreditne kartice, na / line transakcija, itd) tako i u okviru i bankarskih sistema (on-line transakcije). Svakodnevna roba, kao što su hrana, odeća, itd mogu se naručiti preko portala na internetu. Čak i razni studijski kursevi i škole se organizuju putem interneta.

Stvarni svet (prostor, ljudi, novac, znanje) se digitalizacijom konstantno seli u virtuelni prostor. Postavlja se pitanje: U koju prostornu dimenziju nas ovakav proces digitalizacije vodi? Ovo glavno istraživačko pitanje će voditi osnovnu diskusiju istraživalja otvarajući osnovne dileme: (1) Da li će stvarni život polako da se nakloni virtuelnom svetu? (2) Da li je ishod digitalizacije dematerilizacija prostornih i urbanističkih sistema? (3) Kakve koristi ćemo imati od virtuelnog sveta u odnosu na mogućnosti preispitivanja razvojnih modela, kao i sagledavanja efekata određenih odluka / putanja u stvarnom životu?

Osnovni cilj rada je da odgovore na gore postavljena pitanja, kao i da potvrdi tezu da imamo veliki izbor uticaja i mogućnosti u smislu urbanog razvoja (na svim nivoima) koji mora da se transformiše u digitalnoj sferi da bi se efektivno i efikasno upravljalo i kako bismo od naizgled odbeglog digitalnog grada kreirali njegovu novu vrednost i metamorfozu.

Ključne reči: *urbani razvoj, digitalni grad, dematerijalizacija, upravljanje*