

WEB-BASED SUPPORT OF SPATIAL PLANNING IN SERBIA

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High-speed access to the Internet and mobile broadband create a new web-based support of spatial planning in Serbia. Perhaps most importantly, this support provides unprecedented opportunities to empower individuals across all social and economic strata. The authors present this view within the framework of two fundamental focal points: (i) relational approach to spatial planning that recognizes the multiple dimensions of diverse people who interact with place and space in complex and unpredictable ways; and (ii) democratic achievement in spatial planning model and governance framework to share information and collaborate across a municipalities' hyperconnected ecosystem.

Key words: *web-based support, spatial planning, relational approach, democratic achievement.*

INTRODUCTION

According to Serbia Investment and Export Promotion Agency (SIEPA) Serbia is 'a small country but/albeit with well educated, hard-working, fast-learning, and multilingual labour force'. Serbian experts have enough theoretical knowledge both about ICT and spatial planning process, but without adequate chances to implement this knowledge. Current dissemination of knowledge and experience through the web could allow Serbia to leapfrog to the latest procedures and methodologies and avoid repeating the mistakes of other, more developed, countries in Information and Knowledge Society development (Bazik, 2008a). The best chance might be found within the new Internet platforms, Web 2.0 concept and open source applications. Satellite data are routinely available at the global level on the Internet and there are many opportunities such as 'add content' to the virtual globe Google Earth. In 2008 there were only 16 different georeferenced 3D models of Belgrade buildings, contributed individually, that could be viewed on Google Earth, and four years later there are more than 1600 3D models created in the voluntary action 'Let's build digital Belgrade'.

At the same time, between 2008 and 2010 the Republic of Serbia recorded one of the most

dramatic changes in worldwide broadband affordability, as reported in the International Telecommunication Union's 'Measuring the Information Society 2011' report (ITU 2011). Access to entry-level broadband services in Serbia cost just over 3% of average monthly income in 2010 and was down from more than 6% in 2008. Broadband affordability in Serbia now easily meets the targets set by the Broadband Commission for bringing broadband to the majority of households in the country. In September 2012 the Broadband Commission appointed by the International Telecommunication Union made a report: 'The State of Broadband 2012: Achieving Digital Inclusion for All'. Serbia was ranked 30th in terms of mobile-broadband penetration, with 34.5 active subscribers per 100 inhabitants, listing 177 member countries worldwide according to the 2011 data on high-speed Internet subscribers (ITU, 2012). The good result achieved in the mobile broadband segment is owed to the fact that all three operators (Telekom Srbija, Telenor and Vip mobile) hold the 3G mobile network licence and that the number of subscribers using 3G network for data transmission and Internet access is constantly increasing (RATEL, Republic Agency for Electronic Communications). Obviously, the main prerequisite for such result is adequate ICT equipment, but it could not be accomplished without subscribers' ICT literacy and motivation for ICT adoption and use. In the same report Serbia ranked 57th in

terms of fixed (wired) broadband penetration, with 10.8 subscribers per 100 inhabitants, which is about three times less than in the case of mobile-broadband options. The main obstacle is the infrastructure implementation. Accordingly, the spontaneous individual initiatives found the alternative way of self-realization in mobile-broadband high spread Internet. Already there are innovative platforms created by Serbian innovators for Augmented Reality (AR) enabling mobile ticketing or QR walking tours that could be supported by more organized contributions through emerging scholarly and governance consideration.

First steps were already made when the Republic of Serbia fulfilled minimum conditions for access to the Open Government Partnership on September 20, 2011 that could represent an encouraging environment for the progress of inventiveness. The Open Government Partnership is a new multilateral initiative (52 countries) aiming to provide support and greater engagement of the worldwide governments in the fields such as transparency of their work, cooperation with the civil society organizations, anti-corruption activity, and a more open, efficient and responsible work of

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public administration bodies supported by new technologies (Digital Agenda, Serbia).

TOWARD THE RELATIONAL PLANNING APPROACH

Why is Serbia's access to the Open Government Partnership significant? Because this membership comprises: (i) fiscal transparency; (ii) free access to the information of public interest; (iii) transparency of the officials' incomes and property; and (iv) participation of citizens and civil society organizations in the governing processes. This ongoing 'informationisation' and 'EU-isation' of the Serbian society creates a new dynamic and more complex environment for spatial planning reinvention. Simultaneously, in the period of post-socialist transition there is a need for a new planning approach that will respond to changed conditions: free market, privatization and political pluralism. There are generally two concepts of change: (i) complete reform of the planning system; and (ii) the 'step by step' approach (Dželebdžić *et al.*, 2011). The first alternative means the 'transplantation' of sophisticated planning systems from a European country which requires existence of a developed institutional network working on its own. The 'step by step' approach seems much more appropriate. Problems could be solved one by one, measure by measure, in an adequate order, with a purpose to fill the gap between theory and practice (Boelens, 2010). It is the only achievable option under the conditions when the market is not fully functional, when the actors and competences have not been articulated, nor have distinct actions been orientated towards rational (market) parameters to a sufficient degree, and with decentralization existing only declaratively.

Additionally, the analysis shows that the 'rational' model, which was present in Serbia during socialism and has in many aspects continued to live in practice even today, is not a rational one in the true sense of its meaning. Also, according to research findings the 'collaborative model' essentially does not replace the rational one, and neither it does in the developed world, but presents the expansion and more precise articulation of the previous model in accordance with recognition of the powers influencing planning in the given social and economic conditions (Lazarević-Bajec, 2009). The country is now facing a 'Europeanization of Serbia outside the EU and with its limited support' during predictably prolonged overall crisis, and a narrowed manoeuvring space for interventions of the public sector aimed at social, economic and

territorial redistribution. There is no doubt that the prospects of developing as a 'civil society' via a model of a complex social, economic and environmental transformation are rather weak – which is at the very basis of the most recent national spatial plan – especially under the circumstances of pending bankruptcy (Vujošević, 2010).

In such contextual framework the Spatial Plan of the Republic of Serbia 2010–2020 (SPRS) adopted in October 2010 ambitiously emphasizes that the spatial development of Serbia will present a continual responsibility for all stakeholders, namely (i) authorities and competent institutions on all levels; (ii) public and private sector which will, through their activities, exert influence on spatial development and its elements, and (iii) spatial planners, town planners, engineers and other experts whose activities will influence changes in space, that is, the quality of changes in certain municipalities, districts or regions (SPRS, 2010). It defined proposals and directives as the Law on Spatial Plan of the Republic of Serbia from 2010 to 2020 for all spatial development issues upon the same methodological matrix consisting of problem definition, basic principles, objectives and tasks, concept with directives or policies, strategic projects (priorities), and measures and instruments for their implementing. This should serve as the guide to all regional and local, general and sectoral plans, strategies and programs in their preparation, since the SPRS is on the top of vertical coordination and integration pyramid for all plans and strategies related to spatial development. In December 2011 the Serbian government adopted the Decree on establishment of the Program of Implementation of the SPRS for the period from 2011 to 2015 that elaborates three key areas of implementation monitoring: (i) strategic priorities/projects of the SPRS; (ii) indicators of spatial development as the starting point for monitoring and evaluation of spatial changes; and (iii) model of information system for monitoring and evaluation of the realization of the SPRS.

In accordance with the article 58 of the in force Law on Planning and Construction, the first Report on the SPRS Implementation and Spatial Development Status was established in March 2012. The Report presents the status of spatial development based on indicators with the aim of monitoring the realization of five main goals of the SPRS and the implementation in accordance with the Program of Implementation. It contains 24 (out of 106 established) selected indicators and an overview of the implementation of strategic priorities of the Spatial Plan,

coverage of the territory of Serbia by spatial plans at all levels and a summary of activities concerning the information system for monitoring and evaluation of the SPRS implementation. The first Report represents an outline of relevant data status and the referent level for future spatial development appraisal, as well as the model of future institutional cooperation in data collection, storage, processing and distribution.

A lot of scholars' papers discuss the adopted SPRS and create a comprehensive overview of the following: the present conditions in post-socialist Serbia; context, laws and practice of planning in Serbia; the transformation of 'plan-making' as a dominant mode of planning; vertical hierarchical integration and horizontal coordination in spatial planning; the way to renew the collapsed strategic thinking; the comparison of the existing comprehensive 'rational' and the new 'collaborative' model of planning; as well as the comparison of institutional framework in Serbia with experiences of developed European countries (Lazarević-Bajec, 2009, 2011, Nedović-Budić *et al.*, 2011, Dželebdžić *et al.*, 2011, Vujošević, 2011, Maksić, 2012). The dominant problems, from our point of view, can be found in (i) a lack of knowledge and readiness to reflect numerous new challenges in the planning process (Lazarević-Bajec, 2011); and (ii) the collapse and re-centralization of former institutions by weakening the constitutional role of municipalities and introducing the 'top-down' principle of government (Nedović-Budić *et al.*, 2011).

In this paper we reflect the new challenges of emerging planning practices based upon an actor-relational approach of planning (Boelens, 2010) and grounded in a relational understanding of space (Murdoch, 2006). At the same time, we consider the experience of European planning practice recognized the need for multi-level governance and rescaling of governance that takes various directions: 'down-scaling' of the state and 'up-scaling' of municipalities (Dželebdžić *et al.*, 2011). It requires spatial planning to adopt bottom-up approaches also. 'Likewise, private stakeholders and investors are gaining in importance as financiers, designers and implementers of planning objectives. Meanwhile, citizens and interest groups increasingly challenge the legitimacy of planning interventions' (Waterhout *et al.*, 2009:7).

We already discussed the concept of relational space grounded in the duality of information phenomenon and contemporary expression of the space notion (Dželebdžić *et al.*, 2011). We perceived that the public knowledge present-

tation (*information process*) is separated as reality or existing fact, and the information (*information system*) is contemplated as a hypothetical product (Bazik, *et al.*, 1996). Main exploration of *absolute*, *relative* and *relational* space in this paper could be: a concept of *absolute* space is adequate for issues of property boundaries and border determinations, but their placement on the property market depends on *relative* space in correlation with location, position, functionality and equipment, or on *relational* space that considers the relationship of and information on financial and energy flows as well as the their compatibility with personal vision, spatial understanding and aesthetic criteria of process participant (Bazik, 2008b). Accordingly, relational space is a *hypothetical construct* and could be considered as a *model of knowledge* separately from its emitter or receiver that is the main characteristic of ICT Age and network society.

Jonathan Murdoch (2006) considers an approach that sets traditional divides, urban–rural and society–nature, within an ecological context that is made up of heterogeneous relations. Yet it sees a continuing relevance for topographical spatial definitions, and urges the creation of a new interaction between spatial relation and spatial location. It admonishes readers to view space not simply as a container, but to attend to processes of spatial emergence. It asks planners to embrace ecological criteria on equal terms with more traditional social ones, and to include previously excluded groups and their concerns as well as an explicit concern for non-human others. It assesses networks one against the other in terms of their impacts on landscapes, cultures and ecologies. And it outlines a distinctive ‘eco-subjectivity’ to help create action for change (Pothukuchi, 2007). A relational view of power and therefore space is layered with a discussion of actor–network theories that describe spatial relations as networks of heterogeneity. The spatial complexity is expressed by networks that may be stable or negotiated as a space of multiplicity. It creates specific time–space configurations and topographical territories that should be combined with a consideration of *topological* processes that refer to the interactions between relations. Murdoch describes a politics of zoning that gave way to ‘a politics of becoming’ in the emergence of heterogeneous relations that combined urban and rural, and social and natural, in new ways.

Relational approach to spatial planning grounded in relational understanding of space offers new possibilities for adopting a real world complexity. The focal points are transferred from objects in isolation to their

relations and from arrangements on the surface to element interactions. Simultaneously, the spatial planning outcome framework for comprehensive monitoring of spatial development contains a set of quality expectations derived from the objectives of planning. It should be space–temporal defined within topology process recognizable for all network actors. The visualization by a traditional map with two-dimensional space cannot be sufficient to reflect the relational complexity of multi-scalar and space–temporal planning entities. Accordingly, the spatial planning ‘outcome’ represents the dynamic ‘model of knowledge’ in a ‘relational’ space context and the most acceptable option for creating web-based support of the spatial planning in Serbia.

WEB-BASED SUPPORT AS DEMOCRATIC ACHIEVEMENT

The question about the significance of Serbian membership in Open Government Partnership in 2011 should be mentioned again (Digital Agenda, Serbia). The free web-based access to the information of public interest and the inclusion of citizens and civil society organizations in the governing/planning processes with high degree of the transparency, however, create the basic framework of democratic achievement in general. At the same time, it represents the precondition of democratizing contemporary planning praxis within participatory planning process and new actor–relational approach. The initiative ‘how to create a more open government in Serbia’ comprises bringing of the national action plan for open government improvement and establishing the mechanism for monitoring its realization within ICT use.

After the year 2000 the democratic market-oriented system in Serbia was introduced declaratively. The market forces operate, however, without any control and unregulated. The interests of one or few actors are satisfied, but their agreed actions do not go in the direction of attaining the social goals. Non-existence or inefficiency of the defined institutions on which the regulated system is founded results in mass corruptive behaviour, the one of exclusively satisfying the partial interests and policies and deformed spatial development (Lazarević-Bajec, 2009). The illustrative evaluation of the level of Serbia’s development by the World Economic Forum (WEF) points out in the best way the key problem and key potential Serbia is encountering. Since 2005, the WEF has based its competitiveness analysis on the Global Competitiveness Index (GCI), a comprehensive

tool that measures the microeconomic and macroeconomic foundations of national competitiveness. The GCI expresses a weighted average of many different components grouped into 12 pillars, each measuring a different aspect of competitiveness.

According to the Global Competitiveness Report 2012–2013 Serbia’s GCI is ranked 95th among 144 worldwide countries. It is very interesting that the most relevant factors for our analysis cover the worst and the best place of 12 GCI pillars that Serbia takes. The worst 130th place Serbia took for the development of *Institutions*, that is the first GCI pillar, and the best 58th place for the *Technological readiness* as the ninth GCI pillar. Inefficient government bureaucracy and corruption are the first two most problematic factors for doing business in Serbia and government instability/coups took the sixth place on that list. On the other side, according to the Internet bandwidth, kb/s per user, Serbia is ranked 20th, and according to the Mobile broadband Internet subscriptions/100 people it took 32nd place out of 144 countries. Obviously, the basic factor for creating a better framework for global-isation and EU-isation processes is the first pillar of the GCI named *Institutions* with 22 indicators. There are, among others, *property rights*, *public trust in politicians* and *transparency of government policymaking* as the key precondition of democracy implementation. It is a government-driven and comprehensive long-term process and we consider that the potential of the ninth GCI pillar named *Technological readiness* should be the most powerful generator of further development of Serbia.

The first Report on the SPRS Implementation and Spatial Development Status presents the status of spatial development based on adopted main objectives that perform a general concept of spatial development in Serbia through qualitative, rather than quantitative, information set for further spatial monitoring. The first level of main objectives operationalization represents the ‘spatial outcome framework’ with quality expectations for phenomena that cannot be directly seen, but reflect the territorial policies concept that is of great significance for decision-makers. The second level exhibits output indicators that are measurable and quantitative (Dželebdžić *et al.* 2011). In the case of ICT development the levels of information set are: (1) the first SPRS main objective *More even-balanced regional development and improved social cohesion*; (2) ‘spatial outcome framework’ that includes *Improving access to infrastructure and information* and *Improving access to ICT*; and (3) ‘spatial outcome framework’ that comprises the share of households with Internet

access. According to the survey of Statistical Office of the Republic of Serbia and the report 'Usage of Information–Communication Technologies in the Republic of Serbia 2012', 47.5% of the households in the Republic of Serbia have the Internet connection – an increase of 6.3% in relation to 2011, 8.5% compared to 2010 and 10.8% increase in relation to 2009. The greatest proportion of the Internet connections is in Belgrade, reaching 60.5%. It amounts to 49.3% in Vojvodina, and 40.6% in Central Serbia. Over 2,100,000 persons use the Internet every day, or almost every day, and over 840,000 persons use electronic services of public administration. As for the enterprises, results of the survey show that 98.7% of the enterprises in Serbia use computers for their business. Analysis of enterprises by size shows that 100% of big enterprises have the Internet connection, 99% of middle-sized enterprises and 97.3% of small enterprises, while 87.4% of the enterprises with the Internet connection use the electronic services of public administration.

Regarding the worldwide context presented in 'The Global Information Technology Report 2012: Living in a Hyperconnected World' reported by WEF, the Networked Readiness Index (NRI) of Serbia is ranked 85th out of 142 countries, with average score of 10 pillars 3.6/7.0 (Fig. 1).

Analysis of NRI shows that Central and Eastern Europe presents a mixed picture in terms of ICT development. While some large countries in Central Europe share similar characteristics, other countries are confronted with specific challenges that influence their capacity to take more or less advantage of the potential of ICT. In the Baltic states, Estonia, in 24th place, following the example of the Nordic countries, has widely recognized the role that ICT can play to transform its economy and society. Slovenia (37th) and Croatia (45th) have both managed to develop a fairly good ICT infrastructure that, coupled with high rates of adult literacy and secondary education enrolment, allows for important penetration rates (37th and 47th, respectively). Improving the quality of the educational system and strengthening the overall innovation system so that ICT investments can be fully integrated and yield better economic results remain an outstanding challenge, especially for Croatia. In contrast with this rather good outlook, Bosnia and Herzegovina and Serbia are relegated to 84th and 85th position, respectively, in the rankings. These scores are the result not so much of the level of infrastructure development or the skill base of their populations, but of the actual ICT

adoption, especially by the business community (126th and 133th, respectively) and the government (123rd and 115th, respectively). In addition, serious weaknesses in their innovation systems, which need to be restructured and expanded, hinder their capacity to leverage ICT for deeper economic and social impacts (Dutta *et al.*, 2012). Accordingly, this is another survey that could underpin the consideration that Serbia poses potential for bottom-up democratic upgrading.

Global computing process is the reality and it extends very fast. Networks' development provides data, information and services for millions as new knowledge generators. The major computing paradigm is moving from closed to open system; from limited to inter-operative system in real time; and from independent to application with flexible use. That offers the possibility for end-user to work with any types and formats of data within one application environment and in continual workflow. Computers, which were once thought of solely as instruments for better scientific understanding, are rapidly becoming a part of the physical infrastructure itself, controlling new infrastructure, electronic highways and smart buildings through their software, influencing the use of that infrastructure and thus affecting communication, information and cognitive function of urban space, both in real and in virtual world (Bazik, 2008b). Nowadays we witness the creation of networked connection between everyday objects named Internet of Things (IoT). There are a lot of mobile devices and smart phones in software clouds and social networks with interrelations

and interactivity that create informal informatics infrastructure and relational space and place of 'smart city'. Smart cities are not simply those that deploy ICT. They combine new technology with smart new ways of thinking about the role of technology in organization, design and planning (Buscher, 2011). Considering that – in the context of relational approach to spatial planning and multi-level governance that takes various directions: 'down-scaling' of the state and 'up-scaling' of municipalities – the authors implemented a specific survey of the web-support of spatial planning in Serbia. There was no intention here to review the professional options like: the status of the realization of the Strategy For Establishment of Spatial Data Infrastructure in Republic of Serbia, or the pilot 'geoportal' of National Spatial Data Infrastructure (NSDI); or the potential of web-based GIS for spatial planning; or even the concept for Information System for Spatial Planning and Development (SP&D IS) that is the part of the first report of SPRS. The authors' first paper about informatics infrastructure appeared in 1996 and was named the *Informatics Infrastructure Development: The Precondition of Sustainable Development*. Web Interactive maps, Virtual and Augmented Reality, Real-time City Hyperconnectivity and Internet of Things represent new ICT phenomena that influence, or will very soon, people's every-day life. Consequently, we analyzed present, 'real-life' activity status of municipalities' web-addresses in Serbia within the time line March 2006 – November 2007 – November 2012, with the intent to recognize possible impacts of new ICT potential.

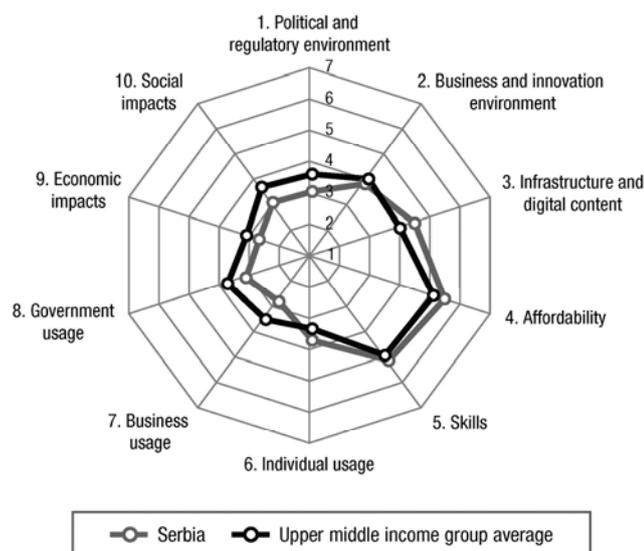


Figure 1. Networked Readiness Index 2012 of Serbia (Dutta *et al.*, 2012)

The number of municipalities is 167 and in March 2006 active web addresses had 51 municipalities or 30.54% of total number, while in November 2007 that number more than doubled – 124 (74.25%). In the present day number of active websites amounts to almost 100 percent – 158 (94.61%) (Table 1). All municipalities have web addresses, but 12 are under construction.

The result of this research could be considered in two ways: (i) as the observation and analysis; and (ii) as looking at the state's or city's 'reflection in the mirror'. This paper will not delve into in-depth analysis of the results presented in the table above. Instead, the intention is to point out that the ICT age offers some new possibilities and tools to recognize partial preferences and relations in considering different levels of space. These issues merit much deeper research and detailed analysis, but the most significant highlight is the growth of motivation for online communication in Serbia. We can find it in the numbers in the table above as: 24% of municipalities have an online system for citizens' reports, and nearly the third of Serbian municipalities maintain trustful and friendly relations with their citizens through some social network. On the other side, only nine municipalities prepare online reports of different ecological impacts of climate change mitigation and adaptation, which could be marked as a problem to be overcome in future government behavior.

Table 1. Content of Official Internet sites of Serbian Municipalities

total number of municipalities 167 / 100%	March 2006		November 2007		November 2012	
	number	percent	number	percent	number	percent
content of Internet site						
active web-addresses	51	30.54	124	74.25	158	94.61
e-documents			85	50.90	148	88.62
strategy and plan			50	29.94	112	67.07
interactive e-administration			32	19.16	121	72.46
interactive forum and inquiry	19	11.38	67	40.12	89	53.29
interactive GIS			5	2.99	28	16.77
system 48hours / citizens' report online					40	23.95
report of ecological impacts					9	5.39
social network, image/video hosting, RSS					51	30.54
active multilingual					39	23.35
weather data, daily currency__					74	44.31
specific __wap, mobile					5	2.99
specific __QR virtual tour					2	1.20

At the same time, with the help of adequate visualization we could analyze relation considering abovementioned 'reflection in the mirror'. Some of the municipalities' web portals are very 'silent' and without any call for interaction. They exist because of directive, without any further ideas of communication and competition. The others are so 'noisy' and aggressive that it is hard to recognize the message. There are no rules, such as – the web

presentation of a municipality is better in regions with high degree of individual usage – and the systematization of analysis could be extremely varied. For example, the web presentations of Trstenik and Pirot municipalities are very communicative and informative although both of them belong to the area with the lower share of households with Internet access (First SPRS report). Indija, which accepted ICT promptly and at the very beginning realized the interactive

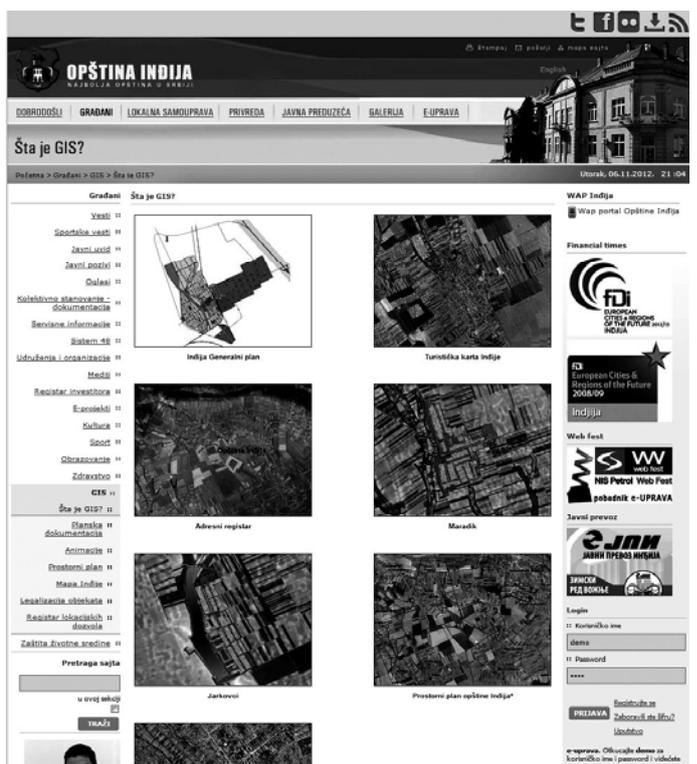


Figure 2. Visualization _ official web portal of Indija

GIS, the most significant content of municipality official web site, represents the best 'web-support' example. Web-based GIS, as the element of spatial data infrastructure, supports the spatial planning in Serbia in a specific way within the 'relation space' of all other data relevant for the municipality and its citizens, including noise level or 'what's happening' on Twitter. All those links to different networks, the portal for mobile devices and bus schedules, point out the difference between governance and government, as well as between an open and friendly and an official municipal web site. This is particularly important in the field of democratic achievements in vertical hierarchical pyramid of spatial planning in Serbia.

We could conclude that the adequate use of Serbia's potential within the *Technological readiness* contributed to Indija overcoming the worst 120th place in the domain of the GCI first pillar – *Institutions*, quite successfully (in March 2012, in Cannes, the Mayor of Indija accepted the award from prestigious fDi Magazine as European City of the Future 2012/13 being the second best European destination of the future for cost effectiveness). Indija produces data that can be integrated with higher levels more efficiently and we expect that it will be the first town in Serbia with relevant data in real-time and City Dashboard on Indija web-site.

CONCLUSION REMARKS

This paper has highlighted the improvement of ICT in Serbia that contributes to spatial planning process. It is in the domain of broadband fixed and mobile technology which redefines Internet access and empowers individuals. Serbia was ranked 30th in terms of mobile-broadband penetration, with 34.5 active subscribers per 100 inhabitants, listing 177 member countries worldwide according to the 2011 data on high-speed Internet subscribers (ITU, 2012).

As we already discussed, the former conceptualization of spatial planning in Serbia was rooted in a rational comprehensive tradition and was too rigidly structured to solve fast and basic changes in socially unstable conditions. On the other side, soft spaces, fuzzy borders and borderlessness request a research into how the regulatory planning system can be made more flexibly interrelated with the particular 'times and places' rather than with generalized theories or accepted methodological protocols (Dželebdžić *et al.*, 2011). According to Boelens (2009), while the debate on the significance of relational geography has influenced *how* planners plan, it has failed to change, in a meaningful way, *what* planners plan. More case studies (Healey 2007,

Davoudi and Strange, 2009) show that planners experience immense difficulty with imagining the complexity of space and place in relational ways. At this point we found the opportunity for the great achievement of high-speed access to the Internet and other data services over fixed and mobile networks.

Over the past decade, the world has become increasingly 'hyperconnected'. We live in an environment where the Internet and its associated services are accessible and immediate, where people and businesses can communicate with each other instantly, and where machines are equally interconnected with each other. This 'hyperconnectivity' is deeply redefining relationships between individuals, consumers and enterprises, and citizens and governments; it is introducing new opportunities, but also new challenges and risks in terms of individual rights and privacy, security, cybercrime, the flow of personal data, and access to information. As a result, our economies and societies will undergo fundamental transformations (Dutta *et al.*, 2012).

The operational framework of this paper analyzed the activity status of municipalities' web-addresses in Serbia within the time line March 2006 – November 2007 – November 2012 with intent to recognize possible impact of new ICT potential. These are the conclusion notes:

- The degree of 94.61% of active web-portals underlines the stimulatory political and regulatory environment for supporting ICT uptake;
- 88.62% of web-existing e-documents of municipalities governance creates different degree of transparent framework with adequate economic and social impact;
- 72.46% of web-interactive e-administration enhances the degree of individual usage;
- 67.07% of web-existing strategies and plans in digital form and 16.77% of existing interactive GIS, highlight the capacity of relevant equipment and network – informatics infrastructure and its affordability – and represent significant web-based support to spatial planning in Serbia;
- 53.29% of interactive forums and inquiries and 23.95% of citizens' reports online create motivation for democratic participation and represent the degree of a society's preparation to make adequate use of an affordable ICT infrastructure; and
- 44.31% with useful information for citizens and 30.54% with different accounts on social networks and portals create the trustworthy and friendly environment.

The fact that only 9 out of 167 municipalities prepare online reports of different ecological impacts of climate change mitigation and adaptation strongly points out the need for further ICT development in this direction in Serbia. Experts in metropolitan data from UCL's Centre for Advanced Spatial Analysis launched the City Dashboard, a hub for real-time data and a live feed of information including weather, transport, local news, radiation levels (London only) and social media trends for eight UK cities. Advances in technology and web-based innovations have made it possible for complex systems to be managed – and self-managed – in radically different ways that enable cities to deliver enhanced services to residents, manage traffic flow and operate public transportation more effectively, and make better use of real-estate resources (Kim *et al.*, 2011). On the other side, social development and social cohesion are no longer the sole responsibility of governments but also the responsibility of private companies and the community. Consequently, a major challenge should be in developing spatial planning model and governance framework supported by public-private partnerships that enable government and the ICT industry to share information and collaborate across a municipalities' hyperconnected ecosystem.

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