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Manfred Schrenk (Hg./Ed.)

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9. internationales Symposium zur Rolle der  
Informationstechnologie in der Stadt- und Regionalplanung  
sowie zu den  
Wechselwirkungen zwischen realem und virtuellem Raum

9th international symposium on  
info- & communication technologies in urban & spatial planning  
and  
impacts of ICT on physical space



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Manfred SCHRENK (Hg. / Ed.)

**C O R P** **2 0 0 4**  
**GEO MULTIMEDIA 04**

**COMPUTERGESTÜTZTE RAUMPLANUNG**

**COMPUTER AIDED SPATIAL PLANNING**

Beiträge zum 9. Symposium zur Rolle der  
**INFORMATIONSTECHNOLOGIE**  
in der  
**STADT – UND RAUMPLANUNG**  
sowie zu den  
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# Building the ICT fundament for local E-government in Serbia - Municipality of Loznica example

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## 1 INTRODUCTION

Recent legislative changes in Serbia, directed toward European integration, established basic framework for implementing the E-government management concept in municipalities of Serbia. In spite of the fact that there are significant ICT potentials (available technological solutions and personal expert knowledge), there is no awareness among the local governmental structures of benefits that this model can provide. So there is no strategy or programs for ICT central and municipality development.

New Law on planning and construction initiated a production of numerous local municipality Spatial and Master development plans. One of these is Spatial and Master plan of municipality of Loznica, which is managed and performed by the team from Faculty of Architecture University of Belgrade. Since there are no actual obstacles for ICT governmental development, except lack of political willingness and determination, we recognized actual circumstances and our work on this plan as a grate challenge in sense of finding a “side” way for ICT implementation in municipal governmental work.

This paper, at the beginning, will present our ICT local development plan and methodological concept of its implementation in governmental and local public structures (except in Loznica we also started with its implementation in more municipalities). In the next chapter the practical results will be presented along with analytical reviews of collected experience. After a first working year we can conclude that we successfully managed to make a first major step in municipality ICT development. We succeeded to get very positive reactions of all governmental and public structures. The planning process become publicly acceptable and transparent... On the achieved results base we made a new action plan for next working period. We hope that after finishing those pilot actions we will be able to produce a practical guidebook for ICT development of municipalities in Serbia under the local actual conditions. This can be one way to ensure more intensive decentralized local development and to increase local initiatives to the central governmental levels towards implementation of E-government management concept.

## 2 ACTUAL SITUATION IN SERBIA REFERRING TO DEVELOPMENT OF MODERN E-GOVERNMENT ICT TOOLS

In order to achieve maximum of capabilities of ICT tools in E-government practice problem solving it is necessary to adjust their structure and usage to the: a) actual legal and socioeconomic context in which strategic development planning process is to be performed, b) practical demands that managing of urban development has to fore fill, c) all participants in urban management process, d) institutional capacities and procedures.

### 2.1 Legal and socioeconomic context in Serbia

The social and economic conditions in Serbia were significantly changed thro three major phases in last 50 years. According to the social and economic changes, the approach to the management of urban resources also has changed. Now, in a developed stage of transition (since last democratic elections), we are in the phase of recognition of necessity for applying modern strategic development planning and management concepts in context of more intensive process of privatization, along with serious legislation and regulation modifications, ...

Aware of necessity of significant changes in planning concept approach, we are nowadays dealing with problem of defining how to adjust our existing institutional and government capacities and their activities to the planning strategic development model demands. The major problems are appearing from incompatibility of existing institutional and governmental capacities and their activities, established 50 ago, in comparison to the organizational demands derived from new modern democratic government model. Changes that are to be made mean *fundamental reorganization of public sector*. Among other, questions of how to develop and use the ICT support in actual conditions are being one of the highest importance.

Large problem is undeveloped legislative framework defining and considering development and usage of ICT tools. Legislative base is founded in Law on Information System of Republic of Serbia proclaimed in 1996. Essentially, this Law defines general principles of initializing the State Information System and obligations of governmental institutions to collect and process relevant data, to digitalize and process them and feely exchange. This low is not instructive enough, and therefore requires logistic in a numerous additional regulations, which will make closer definition of this activities.

In absence of other legislative and regulatory documents, performing practice leads to inconsistent informational activities on all governmental and public service levels. In a first place a clear National strategy for developing state GIS is missing. Also there are no instructive action plans for all governmental levels, and at the end no operational regulations witch will define rules, conditions and responsibilities of data exchange and instruments of their validity identification, ...

New Law on construction and building adopted in 2003 establishes Republic Agency for Spatial Planning, which has, among others, authority to establish unique Information System on Environmental condition in Serbia. By this low usage of European standards of spatial units, along with demand that planning solutions are to be produced in digital form is required. This reflects aiming of Serbian

Government towards European and world standards in a field of developing ICT support to governance. Assumption can be made that in a further operational work of the Republic Agency closer strategy definition and regulation of GIS development will be made.

On the other hand, according to the new Law on Local Self-government, adopted in 2002, authorities in a field of spatial and urban planning are mostly transferred on a municipal level. This law, nevertheless, does not clearly refer to the questions of implementing of information and communication activities on a local level – it does not encourage it, or restrict it. At the end, still there are no legal solutions, which will define E-business in general, and accordingly in public services and governmental institutions. In operational sense these solutions should provide a base for establishing rights, responsibilities and verification instruments in electronic data exchange, which will also provide security and reliability of E-business.

## 2.2 Actual ICT activities of local government institutions and public sector

Large number of institutions on all government levels in Serbia works with digital data. Enormous number of evidences about inhabitants, economy subjects and spatial resources is done electronically (for instance, unique evidence of inhabitants, statistical data about spatial resources, registers of companies and enterprises, register of tax tributaries,...). Nevertheless the problem is that gathering information activity is not coordinated or related to each other. Therefore information gathering in practice is usually in internal use of each specific institution of local public sector. In addition, there is anxiety in free exchanging data process (in spite it is required by the law) therefore many institutions have separate evidences on the same data. That increases redundancy of gathered data and questions their accuracy and reliability. At the end, most frequently this information databases were designed upon linear data models, which haven't been changed in last over ten years. In present organization in a transition process, it is very unlikely that this data bases can answer to the new needs and demands without serious structural change. *This means that in this moment Serbian government has significant information potential, which is not utilized in spatial and urban management process in maximized way.*

It is very interesting that there is a significant activity in usage of modern ICT in Serbian municipalities. In some municipalities a big efforts are being made toward development and constituting information systems and tools in order to improve public service. Since legislative framework and strategy is missing, these activities are not highly coordinated or conducted, but they produce results, which mustn't be underestimated. It is possible to make observation that ICT knowledge is highly diversified among the people and companies. Of course, concentration of ICT knowledge potentials is especially high in big cities and in a large disproportion to the ICT presence in small municipalities.

According to municipalities ICT potentials preliminary research, there are no rules how people educated in field of ICT are being included in development of local public service. For instance, in some very small and most undeveloped municipalities, where is expected to find no ICT experts in public institutions, occurs group dealing with digital cadastre with accurate database. On the other hand, in some very large municipalities, with very important strategic resources, local institutions have, all together, a couple of old computers with no serious use. What is the nature of this?

Actually, this kind of situation is a result of the fact that modern ICT tools implementation in public service is most often consequence of single or group of persons initiative. Previous period of isolation of our country from international organizations and laws provided good environment for spontaneous development of the ICT. This paradox fact is a result of uncontrolled market of hardware and software. In last ten years our market was overflowed with inexpensive computer hardware and what is even more important, with cheap pirate software. So, our citizens were in situation to buy computer and work with newest software's. If they are, by any chance, employed in local government or public institution, and if they were persistent enough, modern ICT would occur in governance activities. If the situation is opposite, ICT becomes completely unknown zone.

This fact enlightens that the problem is derived in governance management structures. If local leading government structures consist of people who understand and accept the importance of ICT in modern governance, than activities in this field will occur and be supported. The other situation is when the initiative comes from ICT educated employees. In this cases the initiative is most often accepted by high management levels (because the computers are something very popular, modern and respectful,...) but their usage is restricted to performing the standard old procedures in a faster way, not as a supportive tool for transition and reform. The fact is that in among of 160 Serbian municipalities, just about 5% of them are first case examples, 30% are second case examples and the rest are in ICT unknown zone.

## 2.3 Practice problem identification

According to the previous, it can be concluded that in this moment Serbian government has significant information potential, which is not utilized because of lack of knowledge among all governance structures. To be exact, lack of knowledge in a field of modern governance models, strategic development planning and management, the role of ICT tools in it, and the ways to implement it in practice. *So, we are in the situation of performing the process of transition with the government organization and structure not linked in any way with the society concepts we are transitioning to.*

Still, even in a context of inconsistently performed necessary legislative changes there is a need and possibility for usage of ICT and E-government methods development. What is especially optimistic and satisfying in sense of remodeling of urban development planning and managing discipline in our context, which was in last ten years completely discredited, is the fact that our society is not completely divided from global development processes. In spite of the institutional conditions (except on the top of governance they are mostly remained from previous social establishment and not friendly toward active applying of E-management concepts and ICT technologies in practice), informal conditions are much more positive: on bottom of governance hierarchy there are numerous young experts very well educated in ICT support to modern environmental planning and management who are trying to initiate more intensive transition changes.

### 3 GUIDELINES FOR DEVELOPING THE ICT FUNDAMENT FOR E-GOVERNMENT IN SERBIAN CONTEXT

According to the previous facts it seems that the primary tool in this moment is the multi level education referring to those whose participation in development process is inevitable. In context of Serbia that means in a first place education of governmental structures along with citizens groups and organizations, and than in a second place experts employed in a public service. The main reason is that on academic level modernization of education program towards modern theories and practice started ten years ago, so there is some know how potential in this group of actors. But obviously that is not enough to accelerate the transition process, mostly because young educated experts have no authorities in the highest government levels. The problem are those who already spent significant number of years working by the old routines, based on a education programs developed in socialistic context, with resistance towards changing and with either fear or unconditional acceptance of everything than comes from "west".

So, as the group of professors which primer profession is to educate, we started to examine phenomenon of education the public structures, excluding the young experts, which are already being educated on academic level. In this moment there are many ongoing education and training programs conducted by numerous international organizations and NGO (UN Habitat, US AID, DAI,...) with objective to increase local capacities in strategic planning, e-government, ICT etc. In spite of the fact that they provide very important knowledge and technology support in some municipalities, in every day life there are no significant results. Obviously more comprehensive activity is needed. Therefore, we decided to make an experimental program of informal education throw practical projects in order to define inner educational and action strategy that local well-educated experts can perform.

#### 3.1 Influencing the high governmental levels

Referring to the previous considerations its possible to make conclusion that it is necessary to define National information strategy, and build and develop the National ICT infrastructure for spatial data gathering and GIS (for start) development. It should define framework for all participants in ICT development. In most of highly developed countries this kind of document already have been made. This document defines information activities as a decentralized and distributed work, which produces results from the practice on the bottom to the E-government on the top. Basic governmental units - municipalities and their network of agencies, with the rest of economic subjects, actually carry out the GIS development process. Government is providing the control, coordination and monitoring of the process, and with mechanisms of subvention stimulates the activities. National information strategies are dealing with next topics:

- Defining of authority and protocols of gathering spatial data,
- Defining of protocol of exchanging and data verification on all levels, which will provide free institutional data flow,
- Defining the mechanisms for efficient structuring and spatial data and information's research - developing of metadata base,
- Defining the working policies and standards of technological equipping on all institutional levels, private companies, nongovernmental agencies and academics levels that will be included in this activities.
- *Process of defining the National strategy must be initiated from the top level of state government, but also must be performed and submitted by active participating of all potential actors in information activities.*

Although general legal framework is established, it seems that on a highest Serbian governmental levels there is no clear vision how and with whom the this task should be performed. Therefore, the communication with the international institutions is established, but in practice the results are poor. So far the activities of our ministries are very slow, highly centralized and not inclusive enough towards local experiences and expert potentials. Since in our context National information strategy is still missing (after four years of intensive transition process), it possible to conclude that even on a highest levels there is no enough capacities (or even motivation) to perform this task. In that sense, we stand for opinion that actual work on a local level is essential input for National information strategy definition. So, the assumption is that if we would have the practical results on a local level and finally increased local knowledge and experience capacities, the initiatives from local level can influence on top governance.

#### 3.2 Building the Local governance ICT capacities

According to previously explained context we decided to start with educational influence on a local level. Since we already have significant experience from implementing the Permanent education program in Town Planning Institute of Belgrade, we decided to implement education programs in a different way, than using classic educational form of lectures and exercises.

The method actually bases on *learning with practice*. Since new Law on construction and building proclaimed local obligation to produce new Spatial and Master plans for municipality territories, the expert's activities have been accelerated. That is, by our opinion, a *perfect chance for planners to make positive influence on all public levels*. Fortunately, as team of planners from Faculty of Architecture we succeeded to get a several plans to conduct and perform in different municipalities. Our main strategy is to change the *procedure* of plan production as much as legal framework enables. Procedure used so far is very simple: planners make plan without consulting anyone, or maybe highest authorities in municipality, than finished plan, after a long time of work, is put on public judgment, but people really react on it and than plan is accepted in local assembly where delegates vote for beautiful colored maps and fat books, which finally get a nice place in shelf of municipality president.

In spite the fact that the plan budget is calculated according the expenses of usually used procedure, we decided to make an extra effort and to propose a new procedures, which would finally by our assumption lead to participants change of attitudes and knowledge widening. In that sense we used two essential advantages: 1) remaining respect that academic authority still have among local people, 2) informal respect that modern ICT generates in common people. First one we use as a necessary base to establish

mutual trust and chance to perform a procedure changes, and the other one, we used as medium that enables effective methodological improvement of plan production. The main objectives of our experiment are:

1. Establish participatory planning process introducing the sensitivity of all participants in to the plan, trying to built up their consciousness and acceptance of proposed plan alternatives, (discouraging the role of experts from instructive toward public service),

*How?*

In spite that there is no law obligation to define the stakeholders and to perform communication between them, we decided to pursue the high local authorities to establish formal communication with upraise all local social subjects. According to resources that they have it could be: -organizing several workshops and round tables about environmental and urban topics supported with ICT, - organizing the info-service in the municipality supported with ICT, - public questionnaires, - WEB site, ...

2. Introduce the strategic planning by providing numerous spatial or master plan alternatives, to be exact - plan as a wide field of possibilities for potential stake holders (the local government most often don't have clear strategies or budget plans for project implementation),

*How?*

Using the differences between point of views of different stakeholders we are trying to improve knowledge capacities of local governmental employment structures aiming to discourse their usual prejudice about their role: from the role of implementing some regulations done by the mighty experts to the role of development managers. According to resources that they have it could be: - producing the numerous public friendly simulated project solutions from the stakeholders point of view just to show that they are not unacceptable and deserve consideration, - producing the development process simulations to show that development depends on local people and local government not to experts, - showing the how better it would be if could use more information from the other institutions and than transform them in to for example cost benefit study with expert system analytical tools, ...

3. Establish complex spatial digital data base as an practical example what GIS is and how can it be used, with aim to illustrate what are the essential methodological planning and management improvements and to produce an interest of local governance to invest in ICT,

*How?*

Simulating creation of spatial information system aiming to show that this work is not impossible, encourage channeling they visioning of necessary organization changes, to understand the role of managing the development in a different way. According to resources that they have it could be: - activating their existing information in a different way, either in our Faculty lab if they have no ICT infrastructure or by the reorganization of they ICT infrastructure usage, - encouraging the public institutions communication on a subject of information exchange, - showing how much easier is to produce the plan presentation in more understandable way for different participants, ...

4. Establish basic ICT infrastructure and knowledge, for further development of information and decision support systems aiming to reorganize existing ICT resources and to initialize further ICT education of employees.

*How?*

Helping the local authorities to understand that ICT development is very important and basic component of good governance, and that investing in it is for the future benefit. On the other hand we show them that investment will not necessary be a big burden to the municipality budget, and that can be implemented step by step in long terms. According to resources that they have it could be: - activating the existing ICT resources in different way, - building the local information teams, - organizing the basic ICT education, - establishing the connection between other international organization activities to the project that we are on, ...

This experiment does not have the idealistic aim to overcome all problems of our current planning concept (because our legal framework doesn't allow it) but to *introduce new methods to all local governance structures* in order to establish critical point of view about our current urban development disciplinary context.

### 3.3 Guidelines for initializing the ICT development on local government level

In 2003 we started with implementing this experimental approach in several municipalities of Serbia (Bajina Basta, Pozarevac, Loznica, Lazarevac, ...) and each time we improved our methods and techniques. The final idea is that on the base of these case studies, we produce practical guidelines for local ICT development based on actual local resources. These guidelines could help establishing a Local information strategy. In this actual moment work on Local information strategies would first of all include assessing the local potentials and defining of program activities, which could be implemented in current legal framework. In addition clear problem identification of local governmental level in a field of ICT activities can be made. All of these preparatory documents could be used for initialization of further considerations on higher governmental levels.

In that sense we considered several major ICT topics on a local municipality level:

- What is the organizational structure of the municipality in domain of ICT activities and work?

This topic includes question of organizational structure of public sector in domain of collecting, updating and exchanging the data, such us: defining procedures and working protocols, existence of public information services, accuracy and quality level of data sets used in working process,...

- What are the actual municipal capacities in domain of performing information and communication activities?

This topic includes questions of structure of inner material, human and organizational resources in public sector, such us: number of skilled employees in public sector that can work on ICT tools, what is technological equipment (software and hardware) that public institutions posses, what are current activities on automatization and digitalizing of working process, current structure of possessed digital data...

- What are the practical problems that municipality has to deal with in a field of ICT?

This topic includes questions of practical problems nature in a field of current information and communication municipality activities, such us: what are the problem of informing the citizens (what are they complaining for)?, what are the problems that appear in decision making process considering accuracy and reliability of information's to decide upon?, what are they information problems that usually slow down the working processes in public sector?, ...

- What is necessary to be done, by the opinion of municipality, to overcome existing problems and increase internal capacities?

This topic includes questions of specification the needs for changes in practice, such us: organizational changes, necessary changes in authority and responsibilities, needs for more skilled and educated employees, needs for improving the technological capacities, needs for public education, ...

- What are the visions and benefits assumptions of increasing the internal municipality's ICT capacities?

This topic includes questions of specification the visions of improved work of local public sector, such us: making the procedures simpler, effectiveness arise, better servicing the citizens needs, solving urgent social, ecological and other problems, effectiveness of government in compression to pre election promises, ...

- What is a funding feasibility assumption in of ICT municipality's public service work?

This topic includes question of cost benefit analysis on applying the ICT tools in public service, such us: how municipality estimates necessary funding for the initial stage, what is funding capability of municipality and other public institutions, what are amounts of funding that already been spent and what mechanisms they have been implemented with, how they evaluate benefits from financing ICT so far,...

After the primary local scanning we make our own action plan about how we would manage the Spatial or Master plan producing process aiming to for fill our education objectives. Action plans ware different according to the particular local context. We believe that this kind of adjustment must be done if we expect practical results.

#### 4 MUNICIPALITY OF LOZNICA CASE STUDY RESULTS

The case of Loznica is very interesting because in a field of ICT resources there was a very polarized situation:

- Among all local institutions only the local planning agency had some ICT infrastructure (hardware and software) and basically trained employees,
- Local governmental structures at the beginning didn't have any ICT recourses. On the other hand there was a positive attitude toward using the modern ICT tools, so they ordered a digital cadastre and ortofoto maps for spatial and master plan production.
- Inhabitants of Loznica municipality are mostly occupied with agriculture or employed in local industry. Low living standards and education levels imply their no connection wit ICT,
- Municipality has no budget for primary investment in ICT, and has no visions how it would improve their work.
- On the other side they are in the DAI Strategic planning program, so they ware donated with the some hardware and software and also education programs,

Starting in this context we decided to perform next activities (most important for paper subject):

- Establishing close collaboration with local planning agency including them in all producing plan process, especially in a field of using the ICT planning tools. Very important was to share all our knowledge and information (analog and digital) with them so they can improve their work from the collaboration and, we could better understand local procedures and customs,
- Opening our working methods to local governance structures. We organized as frequently as possible ICT supported presentations of planning progress to all relevant employees in local public service and local experts. Except the standard information results the presentations showed adaptability and efficiency in changing and adjusting the data, showed the increased possibility to work with a significantly large amount of data, ...
- Establish public discussions in municipality with ICT supported presentation as a discussion initiation. Since there are a small number of citizens that can use ICT establishing the web site was ineffective at the moment. We decided to organize several meetings with citizens and local community groups, trying to establish their trust and interest for planning process by using the visualizing ICT tools,
- Activating the ICT infrastructure that was donated by DAI. Since initially there was no ICT resources in the municipality all ICT work was done in the Faculty of Architecture, but as soon as donated ICT equipment was in use we made the plan working results accessible to municipality employees aim to provoke their own initiatives to deal with strategic development issues...
- ...

At this moment we finished first phase of plans production – presenting the information base about current environment condition, expressed local needs and initiatives, identified recourses improvement or change potentials... We made a comprehensive inventory digital atlas of Municipality of Loznica. In past six months all our team members were in direct contact with all participants (we invited to our numerous presentations all authorized groups and common citizens).

The six-month working results are:

- We established very close and trusting bond with municipality authorities. They sensed the benefit from numerous public presentations, which entitled them as transparent democratic, not autocratic, governance. They are very satisfied with a fact that they don't have to decide upon all problems by themselves but to share decision with other participants. They are satisfied with the fact that people not only attack them but started to communicate with them about their problems...
- We established very close communication with local citizens groups, and encourage some of them to organize and perform in a formal way. At first public reaction was completely surprise and disbelief that they are asked something about. Then more trusting communication was established and they had no fear to experts they vision or demands for urban environment. We succeeded to encourage the local stakeholders to show interest for the plan proposals establishing the trust in our willingness to provide the optimal fast solutions for their investment...
- We succeeded to promote the local planning agency to the informal information coordinator of municipality. Since they had certain ICT potentials it was most appropriate to start with them. On the other side they opened their view about what are the available information, how they can be used in planning process, and now they started to create their own analysis and to present them in a common people more acceptable ways
- ....

Since we, by our criteria, successfully finished first phase of this experiment we are going to continue to operate until we finish the plans. The question is what will happen then? We are determined to monitor the transition of local governance in these municipalities. We hope that they will change their attitude toward the transitioning process. We plan to offer them a vision of how their future activities can be managed. The partial side indicators of our success are the fact that there are new municipalities interested in our mythology of planning. Until the end of this year we will have complete experiment results, hoping that we contributed to our country transition process.

## 5 CONCLUSION

In our context in spite of the fact that information and communication technologies and tools are significantly present in working processes, there is a large number of people whose knowledge of GIS and DSS tools and their capabilities, working principles and usage benefits are very narrow. This knowledge deficiencies can be observed both with governmental and public service employees and with common citizens.

Especially problematic are people with no basic information knowledge, who have difficulties to follow logic of contemporary computer tools. These people often interpret computer as a black box, and therefore either fear from them or think that computers have unlimited abilities. Both of these common attitudes have bad influence on ICT development process in a specific environment.

It is clear that, in spite of present limited institutional capacities and lack of adequate legal framework for ICT activities, they slowly but surely involve all our social structures. *In that sense it is important to continually work on this meters as far as context allows.*

In that sense, it is necessary to begin multilevel education *learning with practice* process. This process should be structured from basically and informative programs to very operationally instructive ones, graduated by the level existing knowledge of participants. Also, these educational programs should be structured by the major topics directed toward roles that participants have in strategic development planning and management process.

Educational and training programs should be organized in a way to enable cooperation of local experiences with other from some different context. It is very important for development of ICT tools to correctly understand developing whole process and the structure of context where it is developed. In that sense, educational programs must be supported with additional informative material which will provide cooperation between generic processes of GIS in different contexts. In that sense it is necessary to establish scientific and academic monitoring of this process aiming to provide link between theory and practice and to define policies, guidelines and help instructions for every day life support.

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