Features and prospects of the information technologies use in urban management (on the example of the city of Volgograd)

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Abstract. This article shows the modern information technologies role in city management. The basic prerequisites for the information technology development in Russian cities are described. The features of the information technologies use in the management of the city of Volgograd are shown, and also the prospects for the information technologies development for managing this city are described.

Introduction
Modern trends in the economy and society development are characterized by rapid processes of urban growth and the urban lifestyle increasing role. The city as a complex system in the modern world attracts more and more material, financial, intellectual and other resources. Nowadays, half of the world’s population lives in cities that account for more than 80% of world GDP. Every year the urban population of the Earth is increased by 65 million people. It is expected that by 2050 about 70% of the population will live in cities [1]. Certainly, the urbanization process has led to the public life all spheres evolution - economic, political, social, spiritual. Significant achievements of mankind in the sphere of science and technology are connected with urbanization process.

Proceeding from it, urban governance is a complex multistep process, and requirements to the city management quality are constantly increasing.

Now all of us hear about the so-called «smart cities» development concept representing an ideal city unique model which is harmoniously combining several components: «smart» economy, «smart» management, «smart» finance, «smart» infrastructure, «smart» environment, «smart» technologies, «smart» residents. Information technologies are becoming more and more important in the modern world urban environment economic, political, social, and intellectual spheres functioning, and therefore the subject of this article has undoubted relevance.

The Information Technologies Introduction Origins in Russian Cities
Serious intentions of the state concerning the information technologies introduction in Russian cities appeared 20 years ago. Then the Ministry of Economic Development and Trade of the Russian Federation developed a ten-year economic development country plan, one of main problem of which was to develop actions for economic lag reduction from the developed countries. It was obvious that one of the necessary conditions for solving this problem was the high-tech sector development in
In order to achieve greater productivity than in the raw sector. In this regard, in 2001 the Russian Prime Minister signed the order about the Electronic Russia program development. The importance of the program is indicated by the fact that, in addition to the Ministry of Economic Development, the Higher School of Economics (the main developer), the Ministry of Communications and Informatization, the Ministry of Education, the Federal Agency for Governmental Communications and Information, the Bureau of Economic Analysis, the Interdepartmental Analytical Center, experts from Russian and foreign IT companies, academic science representatives took part in its development [2].

The continuation of this program has become the Information Society (2011–2020) program. This program consists of four interconnected blocks: Information and Telecommunication Infrastructure of the Information Society and Services Rendered on its Basis, Information Environment, Security in the Information Society, Information State.

It is remarkable that the participants circle in the program development has been transformed. The Internal Affairs Ministry of Russia, the Foreign Affairs Ministry of Russia, the Ministry of Culture of Russia, the Ministry of Science and Higher Education of Russia, the Ministry of Defense of Russia, the Ministry of Economic Development of Russia, the Ministry of Transport of Russia, the Ministry of Emergency Situations of Russia, The Federal Archival Agency, the Federal Security Service of Russia, Federal State Statistic Service, Federal Service for accreditation, The Federal Service for Supervision of Communications, Information Technology and Mass Media, Office of the President of the Russian Federation, The General Prosecutor of the Russian Federation, Rosatom State Corporation, Federal Service for Intellectual Property were involved in developing the program [3]. As can be understood from the participants list, the information technologies problem introduction into the modern society life has become increasingly relevant, large-scale, and significant. Also, from the participants list it is possible notice that the increasing attention is paid to the information security issue.

As a result of the program, all Russian universities, and also most colleges, technical schools, lyceums and schools are connected to the Internet; large-scale digital libraries and other databases are created; the systems of telemedicine, remote rendering consulting medical services, etc. are implemented.

The Information Technologies Features Use in Management of the City of Volgograd

The city of Volgograd is a million-plus city with an important historical, geographical, social, economic, cultural and spiritual significance, as a result of which serious demands are placed on its management quality. Moreover, Volgograd is the longest city in Russia, which strongly influences, for example, the speed of moving around the city (it can take up to 2 hours to travel by public transport from a distant region to the city center). The length of Volgograd greatly complicates the material, information and human flows management.

Effective management of such a complex and large city is impossible without intensive introduction of information technologies in the management process. This led to the fact that in the current year the Digital Development Program of the Volgograd Region was approved by the governor of the Volgograd region. It includes several key basic projects:

1. Digital city management. It is necessary by means of electronic space with digital information technologies use to achieve an implementation possibility of all the administrative functions:
   - planning the development of the city of Volgograd, including the planning of all economic, political, social, cultural indicators;
   - events organization to achieve the chosen city development strategy;
   - all municipal services motivation;
   - leadership in city management processes;
   - control over the measures implementation to manage the city.
2. Information infrastructure. It is a very important program part, because without the necessary infrastructure, it is impossible to carry out digital city management. Now the city’s information infrastructure should be an integral part of it, as well as transport, communications, energy supply, the banking system, etc. The following components (figure 1) have to be a part of information infrastructure of modern Volgograd, at least.

Figure 1. Necessary components of information infrastructure of a modern large city of Russia

3. Information security. In the epoch of information transfer to electronic space, it is very important to prevent unauthorized access, alteration, use or destruction of information. This is especially true of important government information, the security of which is related to the safety and efficiency of the entire city.

4. Digital environment legal regulation. Creation of competent, sought-after legal support of functioning of information technologies is an integral part of effective city management.

5. Frames for the digital economy. It is a very important program block. The introduction and use of information technologies in the management of the city will be impossible without highly qualified personnel. This problem is directly related to the education system, which should transform and improve the educational process in order to provide the labor market with competent personnel capable of implementing and using information technologies. The following leading universities that can successfully train personnel for the digital economy are located in Volgograd: Volgograd State Technical University, Volgograd State University, Volgograd State Social and Pedagogical University, Volgograd State Agricultural University.

We consider that the digital literacy needs to be cultivated from school. It’s not for nothing that Volgograd became the participant of the large-scale project of the Figure Lesson within which pupils in game online got to know the methods of management of projects, prospects of artificial intelligence, algorithms creation bases, etc. This project was implemented jointly with the Ministry of Education of Russia, the Ministry of Digital Development, Communications and Mass Media of Russia, the Digital Economy organization, the largest Russian IT companies (1C, Yandex, Kaspersky Lab, Kodwards, Mail.Ru Group) and Sberbank Charitable Foundation. This project has aroused great interest among students and teachers of the Volgograd region. [4]

One of the main goals of the above-mentioned projects is to create a general information space. An important element of the information infrastructure of the city, allowing for the operational and constructive interaction of residents, organizations and authorities of Volgograd is the integrated
information E-Government system of the Volgograd Region, which is based on the integration platform SAP NetWeaver and consists of four functional subsystems: SAP Record and Case Management, SAP Enterprise Portal, SAP Business Intelligence Integrated Planning, Customer Relationship Management.

The information technologies development prospects in the city of Volgograd

The digital technologies spread grows rapidly. New advanced programs, new modern technologies appear. The information technologies development prospects in the city of Volgograd are great, let us designate some of them.

On April 17 this year, the administration of the Volgograd region and the Tele2 Company signed a cooperation agreement. As part of the agreement, the company plans to implement large-scale infrastructure projects, including the expansion and modernization of cellular networks in Volgograd, Volzhsky, Kamyshin, Mikhailovka and in all administrative centers of the municipal districts of the Volgograd region. Also, according to the agreement, the investor provides 4G standard in 20 districts of the region for the modernization of existing equipment. The new communication facilities construction is planned in 27 locations, ten of which are outside the other cellular operators’ coverage area. The investments volume in the capital infrastructure development will be up to 390 million rubles, the total amount of investments will reach 750 million rubles. [5]

We should also pay attention to the fact that within the federal project in Volgograd, a new format of services will appear - the so-called “digital super-services” which help to transfer several vital services, situations for residents and for business into digital space. The super-services were approved at the beginning of this year by the Digital Development Commission. They include online payments for the services of schools, kindergartens, clubs and sections; registration of the digital policy; online pension calculation; obtaining a digital health insurance policy, registration of a digital hospital; digital workbook; registration of licenses and permits for various types of business activities; electronic registration of benefits; electronic loan processing; digital construction, digital enforcement, online justice, etc. [6]

The super-services development will promote to the Information Society Development program successful implementation of the Volgograd Region, which has to contribute to increase the level of interaction between residents, organizations and the state with the aid of information and telecommunication technologies in the Volgograd Region. The following indicators planned at the end of the program period are interesting:

- the citizens’ share appeals to the Governor of the Volgograd Region, filed through the portal of the Governor and the Administration of the Volgograd Region, to the total calls number to the Governor is 25%;

- the electronic document flow share of executive authorities of the Volgograd region in the total document flow volume - 90%;

- the inspections share carried out on the regional state control priority types, information about which is entered in the unified register of inspections using a unified system of inter-agency electronic interaction, in the total number of these inspections - 75% [7].

If we analyze the data for 2018 (Figure 2), the services digitalization rate for the residents of the city of Volgograd has already exceeded the planned figure. It can also be noted that the Volgograd region is ahead in this indicator magnitude, for example, the Voronezh region, approaching the capital of Russia in this indicator level terms.
Figure 2. The share of citizens using the obtaining state mechanism and municipal services in electronic form at the end of 2018 [8]

It should be noted that the UEM use (Unified Endpoint Management) solutions can be a promising direction for the information technologies development in Volgograd. This is a unified control system for the operation of smartphones, tablets, laptops and desktops. An opportunity to operate devices by the uniform center not only increases the information security level in commercial or non-profit organization, but also significantly reduces the devices growing fleet operating costs. Monitoring is carried out from the stage of setting up the gadget and the operating system to working with applications and data warehouses. [9]

Also, we find it possible to introduce the Skala-R domestic hyper convergent platform into the Volgograd city administration work. The Russian hyper-convergent computing Skala-R platform is a fully configured module, on the basis of which a data center of virtually any capacity can be assembled. The system includes the equipment for the transmission, processing and storage of information, and also it includes the software for virtualization, management, monitoring and information security. Convergent infrastructure eliminates the fragmentation of the customer’s IT environment, usually divided into computing systems, data storage systems, network equipment, business applications and services. Various configuration options for Skala-R provide for the possibility of installing this system not only in dedicated server rooms, but also in unprepared premises, since they can include all the necessary engineering infrastructure including sound insulation, ventilation, air conditioning, uninterrupted power supply, alarm systems, video monitoring, etc. [10] An important advantage of Skala-R system is a lower cost compared to foreign analogues. Recently, this hyper convergent complex was successfully implemented in the Administration of the city of Perm. In our opinion, the use of this system by the administration of Volgograd would be a bold and effective solution.

Summary
Urbanization has become our planet integral life part. The growth and development of cities as complex systems leads to the relationship complication between their subsystems - political, economic, social, cultural, intellectual. As a result, the modern city management contributing to the improvement of urban well-being, including the well-being of their inhabitants, now becomes possible only with the modern information technologies use. The management of such a large city as Volgograd should be based on an effective information infrastructure - e-government, computer networks, modern software, digital databases, etc. In Volgograd, there is a large field for the introduction of digital solutions such as UEM-systems and hyper-convergent systems like Skala-R. We believe that the city of Volgograd is able to use all modern digital technologies in order to become a “smart” city with happy inhabitants.
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