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**"SMART CITY": THE IDEA AND BASIC CONCEPTS**

**Abstract:** *the article examines «Smart City» as a concept that represents the use of information and communication technologies for more effective control and management of urban economy, city assets, such as schools, libraries, hospitals, law enforcement agencies, public services, power plants, etc. It is worth noting that this project is spreading more rapidly in the context of urbanization, because it can be used to find solutions to various social problems.*

**Keywords:** *information and communication technologies, smart city, concepts.*

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## «УМНЫЙ ГОРОД»: ИДЕЯ И ОСНОВНЫЕ КОНЦЕПЦИИ

***Аннотация:** в статье рассмотрено понятие «умный город», представляющее использование информационных и коммуникативных технологий для более эффективного контроля и управления городской экономикой, муниципальными учреждениями, таких как школы, библиотеки, больницы, правоохранительные учреждения, заводы и т.д. Стоит отметить, что данный проект, в контексте урбанизации, стремительно развивается, это связано с его возможным использованием в разрешении различных социальных проблем.*

***Ключевые слова:** информационные технологии, коммуникативные технологии, умный город, идеи.*

The «Smart city» project is mainly aimed at increasing the competitiveness of Russian cities, creating an effective management system in all territorial units, and creating safe and comfortable conditions for all citizens of our country. The main key for solving this problem is the introduction of advanced information technologies in urban infrastructure.

The main objective of the Smart city program is the development of human capital. To solve this problem, certain conditions must be created in which each resident can realize their life priorities. Also, one of the main principles of this program is equal opportunities for every citizen. The implementation of this principle will be implemented with the aid of digital technology.

Key indicators of the concept of «human and social capital»: the life expectancy; healthy life expectancy; the proportion of citizens who regularly engaged in physical culture and sport; place of Moscow schools in the world ranking; the proportion of buildings accessible to persons with disabilities; the proportion of citizens trained out of the total applicants, whose activity is automated.

As you can see, the key components of this concept are health, education, social sphere and culture.

Seven years ago, a unique EMIAS system was created. over this long period of time, it has been used to make more than 400 million records to various doctors. In

addition, in some institutions, patients have an electronic card that is convenient and does not get lost. To facilitate the work with medicines, a Single reference list of medicines for hospitals and pharmacies was created.

The goals of the «Smart city – 2030» program in the field of healthcare are to introduce digital technologies in the healthcare sector to improve its quality, create a space that will unite many healthcare systems, and ensure the security of data storage in the information space.

Strategic directions of the health program:

- principle 5 «P»: predictive medicine, preventive medicine, participatory medicine, personalized medicine, precision medicine;
- electronic medical records and genetic passports;
- remote diagnostics and health monitoring;
- artificial intelligence in medical ecosystems;
- strengthening requirements for information security of medical data;
- three-dimensional self-modeling in medicine and three-dimensional printing of organs;
- robotic surgery;
- wearable and implanted medical digital devices;
- gene therapy and genome editing;
- an urban environment that promotes a healthy lifestyle.

In 2016, the «MASH» project was launched. Its goal is to introduce information technologies into the learning process and improve it accordingly. This system includes many projects, one of them «Passage and nutrition», implemented in 3,500 schools at the end of 2017. Another project is the «School of new technologies». Because of it, students get access to it competencies, and thanks to this they create a variety of solutions that are applied in practice.

The goals of the program in the field of education: to create a single accessible, safe, flexible educational environment to ensure a high level of Moscow education, as well as to develop systems that allow teachers to improve their skills.

Strategic directions of the education program:

- public school management;
- latest educational technologies;
- digital educational programs.

The portal of public services of the city of Moscow provides social support services to the population in electronic form. There is an average of 4.6 million active social cards in circulation. There are also many social projects being implemented in the city, including «Moscow longevity».

Program objectives the social sector is the rising popularity of social services and the awareness of the public about the benefits of using digital technologies; address the representation of General social services assessment of urban data; expansion of the labour market and the complicity of employment of citizens through utilization of digital technologies; the involvement of residents and business community in the process of social assistance to citizens.

Strategic directions of the program in the social sphere:

- improvement of electronic public services in the field of social services for citizens;
- updating the labor market and promoting employment of citizens through the use of digital technologies;
- development of the scope of the digital identifier for providing social support to citizens;
- targeted assistance to people in need through crowdsourcing urban projects.

In museums under the Department of culture of the city of Moscow, the introduction of a system of centralized accounting of Museum exhibits has begun. The navigation and tourism portal «Learn Moscow» is also actively used, and the mobile app «Learn Moscow» has been downloaded more than 400 thousand times. The project «Music in the city: festival «Street musician» is being implemented, which allows professional musicians and admirers to book a venue for performances after pre-registration on the website of the Moscow Government. The project sold more than 11 thousand applications and organized more than 7 thousand concerts.

The goals of this direction are to increase citizens' awareness of cultural events, to spread the cultural life of Moscow through the use of digital technologies; to improve the quality of state institutions and cultural objects, to guarantee the digitization of all data from libraries, museums, and archives; to promote the cultural heritage of the capital among Moscow residents and tourists due to the creation of an open infrastructure using digital technologies.

Strategic directions of the program in the field of culture:

- digitalization of data from libraries, museums and archives in Moscow;
- online broadcasts of cultural and sports events;
- notification of cultural events;
- expansion of e-services in the field of sports and culture;
- interactive map of Moscow's cultural heritage.

To increase the living standard of Moscow citizens it is necessary to cope with the whole complex of challenges that are based on planning and building the urban infrastructure including the development of the ecosystem's personalized urban services with unique and useful interface that will be used by citizens. The predictions of the Federal State Statistics Service of Russia are that by 2030 Moscow agglomeration's number of residents will have increased in the amount of 22 million people. The concept of «Smart City – 2030» in the urban development sphere is aimed for planning and building enhancement of Moscow on the analytics base of the next generation and digital technologies. In this aspect the concept of consistent implementation and gradual scaling based on the territorial and functional pilot projects will be used what will provide accurate analysis and detection of perspective concepts of Moscow concept realization.

The main indicators of the «Urban Environment» concept: part of the city objects, during the construction of which BIM-technologies (Building Information Model) are used; reducing the number of interactions between developers and authorities; modernization of the infrastructure for the collection and disposal of industrial and municipal solid waste; the number of emergencies at the facilities of the Russian Municipal Engineering.

The two key areas of the «Urban Environment» concept are urban planning and housing and communal services.

About 94.4% of public services in the field of urban planning are provided in electronic format, the main part – only in electronic form. It should be noted that a comprehensive information and technological infrastructure of the executive authorities of the «Стройкомплекс (Stroykompleks)» was created, which allows quickly mechanizing the internal processes of executive authorities and organizing effective cooperation with members of the construction.

The main goals of this direction include planning for the development of territories, which is based on the intellectual study of urban data, improving the quality of creating documents for planning the territory and urban planning zoning; reduction of time and capital investments for solid construction due to the digitalization of the life cycle processes of objects and the introduction of BIM technologies; reduction of terms and optimization of the procedure for implementing procedures in the field of construction; ensuring the obviousness of management, prevention and detection of offenses in the urban planning sphere through the use of digital technologies.

Urban planning strategies:

- use of BIM technologies at all periods of the life cycle of construction objects;
- a unified digital platform in the urban planning sphere – a platform for electronic interaction of developers, banks and authorities within the framework of a construction project;
- adaptation of «Smart City» technologies for organizing a «smart construction site»;
- creation of an integrated information system for handling all types of waste at construction sites;
- use of smart contracts in construction;
- implementation of conditional and augmented reality;
- advanced construction techniques.

The total number of vehicles connected to the GLONASS system has reached 15.5 thousand units. For all courtyards in the city, automatic monitoring of the quality of sanitary maintenance is carried out using GLONASS.

The objectives of this direction are: improving the quality and acceptability of the services provided by housing and communal services through the implementation of digital technologies; increasing the efficiency of resource use in housing and communal services and ensuring the savings of the budget of the city of Moscow; ensuring transparency of management, prevention and detection of offenses in housing and communal services, enhancing the level of safety, reliability, accessibility of the infrastructure of housing and communal services and eliminating accidents.

Department of housing and utilities strategies:

- application of BIM technologies at all stages of the life cycle of utility infrastructure facilities;
- creation of a general «System of systems» based on the research of Big Data and Artificial Intelligence;
- application of digital platforms and IoT platforms;
- use of information and analytical tools.

Traffic jams and low travel speeds have long been one of the main problems in Moscow. With the use of digital technologies, public and private transport can be used effectively. The concept of the «Smart City – 2030» project in the field of mobility is aimed at the city's transition from outdated systems to innovative mobility systems.

Key indicators of the «Digital Mobility» concept: average travel time of citizens by public transport in the morning rush hour from sleeping areas near the Moscow Ring Road to the city center; satisfaction of people using public transport services; part of environmentally friendly vehicles; the number of trips of Russian citizens for tourism to Moscow.

Nowadays, Moscow public transport is one of the most advanced transport systems in the world: new metro lines are constantly being built, and at a very fast pace, the fleet of buses and trams is being updated (more than 500 electric buses have already

been introduced, the same number of modern trams «Vityaz-Moscow» have been introduced), methods of payment for travel are being improved, namely, payment for travel by means of electronic rings, all types of social cards. Also, a pilot project «video surveillance with a face recognition system» was launched in the Moscow metro.

The objectives of this direction are to provide conditions for the maximum possible mobility of the population; implementation of the «Mobility as a Service» concept, which implies the choice in real time of the most favorable route parameters, travel time, price, level of convenience and environmental impact; development of a city-wide personalized online service for highly intelligent mobility; formation of road transport infrastructure for the use of unmanned vehicles; reduction of average travel time with super intelligent transport structure and digital services; abandonment of personal vehicles in favor of public transport.

Strategic directions of the program:

- mobility as a Service (MaaS);
- intelligent Transport System of Moscow (ITS);
- «transparent» digital technologies in the field of transport;
- unmanned vehicles;
- ecological transport.

Now Moscow is among the three world city leaders in terms of infrastructure preparedness for the introduction of super technologies of the future. One of the most modern Wi-Fi access systems in the world operates in Moscow, which has more than 30 thousand access points. The system of Internet trading is also very developed, banking services operating at a distance are developed, there are a large number of transport mobile applications.

The main goals of this direction: joint activities with large vendor companies; promotion of the latest communication technologies in Moscow (LTE-M, 5G, NB-IoT); the dissemination of programs in the field of education in the field of digital technologies, an increase in the interest of Muscovites in information technologies.

Strategic directions of the program:

- advanced ICT infrastructure as the basis of the digital economy;

- worldwide export and regional export of ICT products;
- improving eSports.

According to TripAdvisor, Moscow ranks second in the whole of Europe in the Best Emerging Travel Destinations category. Also, in 2017, more than 20 million tourists visited Moscow.

The main goals of the «tourism» direction in Moscow: improving the openness and quality of tourist services through the introduction of digital technologies; increasing the attractiveness of the city of Moscow as a tourism center using digital technologies.

Strategic directions of the program:

- reliable and comfortable tourism sector;
- favorable conditions for people and tourists with disabilities.

In conclusion, this project is more relevant than ever in our time, since every year urbanization is only growing, and local governments are not able to pay attention to all the requirements and monitor quality control for the entire population of a city of one million, but because of information and communication technologies, this will not be difficult any more.

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