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"Smart Cities": Legal Regulation and Potential of Development

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Digital platform,
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municipal law,
smart city

Abstract

Objective: to research the trends of development of the "smart cities" concept and their legal regulation.

Methods: general scientific (induction, deduction) and special (systemic-structural, comparative-legal analysis) methods were used. Also, review analysis was applied to analyze the status quo of "smart cities". Innovative research approaches are still rare in considering the "smart cities" concept, as well as the prospects referring to targeted knowledge management and cooperation between the respective stakeholders. As for the special research methods for studying digital relations, we used content analysis (the method of creating reproducible and substantiated conclusions from texts (or other meaningful materials) in the context of their use). As the results of previous research and concepts referring to "smart cities" are available, we also used deductive content analysis.

Results: a characteristic is given to public relations formed within the process of development of "smart cities" concept. The key legal acts, principles of formation and functioning of "smart cities" are identified, taking into account the Russian and foreign experience. In this connection, the examples of successful practices are given, of the activities of both Russian and foreign municipal entities, taking into account the competitions held and rankings determined by the central structures. The popular directions are summarized, which are broadly introduced at the local level, and the probable problems are identified in the sphere of implementation of this project in our state.

Scientific novelty: the article carries out an analysis of the current legal regulation and the results of introducing the "smart cities" concept. The promising technologies and methods are identified, which are necessary to achieve the tasks of the concept implementation. The elements are specified, which ensure sustainability of "smart cities" complying with the future demands. An author's position is expressed regarding a close interrelation of this phenomenon with the institute of local self-government in the context of possible development of the latter into the process of making managerial decisions involving artificial intelligence. This concerns, first of all, using the potential of the Internet of Things. In practice, a lot of problems occur, associated with the implementation of normatively stipulated provisions, which implies the need to perform further research in the sphere under study.

Practical significance: is due to the insufficient development of data about the features and prospects of introducing the idea of "smart cities". The provisions of the research performed will allow effectively improving the mechanisms of legal regulation and broad implementation of the concept under study.

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Contents

Introduction

Nowadays, the significance of cities as the main centers of social-economic life is growing. On the one hand, they become the main places for the people to settle. Indeed, 55 % of the population worldwide now live in cities, and by 2050 this share will reach 70 %. In particular, in the European Union these figures are even higher – 70 and 80 %, respectively.

Modern digital technologies have led to significant changes in the life of various states and societies, and transformed the principles and methods of management arrangements. These processes also touched upon the local, not only state-wide, level.

While in the 1990s we spoke of the so-called eco-cities and low-carbon cities, nowadays more and more promising becomes the idea of the so-called smart cities broadly using

information and digital technologies, including the Internet of Things. This idea captures the minds of politicians all over the global community, including Russia, as it allows a city functioning as a single organism.

A smart city is a city using a set of the most advanced technologies, first of all, information and communication ones, in order to render higher quality services to its citizens and users. This general definition opens doors for participation of many stakeholders in drafting smart cities, including computer scientists, engineer programmers, business managers, city developers, city builders and officials. Indeed, creating a common structure for "smart cities" is difficult, and it is even more difficult to measure its success in implementing its vision.

The modern concept of smart cities appeared from the very first initiatives for creating digital cities in the 1990-s. Besides, over the years it has turned into an idea using new technologies of the Internet of Things to achieve the strategic goals of a "smart city".

"Smart cities" may become a factor of overcoming many of the current socio-economic problems and facilitate economic growth. The idea is based on the concept of possibilities for each person's self-implementation. This is an intersection of digital technologies and intellectual potentials of management systems. The concept became an effect of the urbanization phenomenon, the growth of the economic significance of cities, and the growing demand for a more stable life (Attaran et al., 2022).

A bright example is the experience of India. New cities emerge between urban centers in order to avoid overpopulation in large cities attracting upcountry people by their prospects. An incentive is the attractive prospects of the new "smart cities" with an advanced infrastructure, simple and accessible in use (Strelnikova & Tsutsiev, 2017). One hundred "smart cities" are currently launched in India, and the authorities hope he citizen will use innovations to solve demographic and economic problems (Jothimani et al., 2022). Similar trends gain momentum in China, from where digital platforms are starting to develop worldwide (for example, Alibaba's City Brain) (Caprotti & Liu, 2020).

1. Legal regulation of "smart cities"

As early as in 2015, the European Economic and Social Committee in its decision pointed out the possibility of using the "smart cities" concept for operative development of the European industrial economy (European Economic and Social Committee, 2015).

In 2016, the UNO Conference on Housing and sustainable Urban Development paid close attention to using the idea of a "smart city".

In Russia, a "smart city" appeared due to a departmental project of municipal facilities digitalization (uniting the Passports of national projects "Digital economy" and "Housing and urban environment") since 2018.[1] This expenditure line is included

[1] Decree of the President of the Russian Federation No. 204 of 07.05.2018. (2018). *Collection of legislation of the Russian Federation*, *20*, Article 2817.

into the federal budget. The list of the project pilot cities includes 79 cities (initially – 33 cities) (Ganin & Ganin, 2014).

The "Digital economy" project comprises the following federal projects: "Normative regulation of the digital environment", "Personnel for the digital economy", "Information infrastructure", Digital technologies", "Digital public governance", and "Artificial intelligence"[2]. As a whole, these projects imply development of an automated system of control and management of "smart cities".

Besides, the "National strategy for development of artificial intelligence up to 2030"[3] and the "Strategic guidelines in the sphere of digital transformation of construction sector, municipal and communal facilities of the Russian Federation up to 2030"[4] in order to ensure acceleration of the development of artificial intelligence, robotics services, and increasing the accessibility of the information provided. Undoubtedly, introduction of these documents into the life practice of the population influences the "smart city" concept, facilitating the efficiency of planning, forecasting and making managerial decisions, as well as the quality of services rendered, first of all, in the policy and social spheres.

In 2019, the methodology of IQ cities evaluation[5] was developed, which identifies important criteria for evaluating digitalization of municipal entities, for example, the presence of intelligent system of social services and the investment climate. In 2022, at the departmental level, the indices of city economy digitalization were stipulated, which determine the possibilities to consider a city to be "smart" (feedback from the citizens, energy sector, safety, etc. – 18 basic and additional indices)[6].

Detailed legal regulation at federal level accompanied the respective project of developing the city of Moscow[7].

At the international level, as early as in 2000, the Okinawa Charter "Global information society" was adopted, which laid the bases for further development

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2 *Passports of the national project "Digital economy of the Russian Federation"* (adopted by the Presidium of the Council under the Russian President on strategic development and national projects, protocol of 04.06.2019 No. 7).

3 Decree of the President of the Russian Federation No. 490 of 10.10.2019. (2019). *Collection of legislation of the Russian Federation*, *41*, 5700.

4 Collection of legislation of the Russian Federation 3883-r of 27.12.2021. (2021). *Official Internet portal of legal information*. http://www.pravo.gov.ru

5 Order of the Ministry of Construction of the Russian Federation No. 924/pr of 31.12.2019. (2019). *SPS KonsultantPlyus*. https://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=EXP&n=379313#q40fMiTCYjxSO6p22

6 Order of the Ministry of Construction of the Russian Federation No. 357/pr of 11.05.2022. (2022). https://docs.cntd.ru/document/350551073

7 On making experiment of establishing a special regulation with a view of creating the necessary conditions for elaborating and introducing artificial intelligence technologies in a Russian Federation subject – city of federal significance Moscow and making amendments in Articles 6 and 19 of Federal Law "On personal data" No. 123-FZ of 24.04.2020. *Collection of legislation of the Russian Federation*, *17*, Article 2701.

of "smart cities"[8]. In 2017, the Asilomar AI Principles were elaborated at a conference in US. In 2019, the UNESCO General Conference developed a resolution on elaborating ethical norms in the sphere of artificial intelligence.

The "smart city" model introduced in Europe since the end of the 2000s was implemented, first of all, on the basis of the work by European Innovative Partnership on Smart Cities and Communities (EIP-SCC).

In 2020, the OECD program on smart cities and inclusive growth was adopted, which comprises a great variety of models based on local peculiarities[9]. The program identifies six key parameters to measure the "smart city" efficiency. Emphasis is made on profitability of investment into the "smart city", as well as bringing the investments into compliance with the city's strategic priorities and citizens' needs.

Since 2021, the Global partnership program of the World Bank "Smart city" is functioning, which is aimed at determining the priority measures to eliminate inequality and digital gap in cities[10].

Speaking of individual countries, France has adopted the Law No. 2016-1321 of October 7, 2016, "On the digital republic", which implies access to public data accumulated by state structures[11].

Another example is the Strategy of smart cities' development elaborated in Budapest, which demonstrates a mixed pattern of "up-down" and "down-up" approaches, mainly due to a special view at strategic frameworks. The local self-government of Budapest is the key factor and participant of the activity developing "smart cities". The Hungarian government implements several projects within its jurisdiction, while the key state services are centralized at the national level, which leaves little space for the city to plan and implement its actions. The Budapest Strategy of smart cities' development is focused on technological approaches. In addition, the activity of developing "smart cities" involves most of the urban areas in an integrated manner; the city is well suited to the European interpretation of "smart cities", paying special attention to environmentally friendly solutions (Csukás & Szabó, 2022).

Similar work is carried out at the level of intergovernmental cooperation. For example, in 2018, the Ministry of Construction and Communal Facilities of the Russian Federation signed a Memorandum with the Ministry of Lands, Infrastructure, Transport and Tourism

8 Okinawa Charter "Global information society" of 22.07.2000. (2000, August). *Diplomaticheskiy vestnik*, *8*.

9 *The OECD Programme on Smart Cities and Inclusive Growth*. https://www.oecd.org/cfe/cities/smart-cities.htm/

10 Gunes Basat, Narae Choi. (July 09, 2021). *5 views: What makes a city 'smart'?* https://blogs.worldbank.org/sustainablecities/5-views-what-makes-city-smart/

11 LOI № 2016-1321 du 7 octobre 2016 pour une République numérique. (2016, 8 octobre). *Journal Officiel de la RÉPUBLIQUE FRANÇAISE*.

of Japan[12]. Japan actively creates and develops "smart cities", for example, the cities Tsunashima and Aizuwakamatsu imply a broad introduction of innovative technologies; Fujisawa and Suita emphasize the ecological component (Langendahl, 2021).

At sublegislative level, the definition of "smart city" is stipulated in our country, which implies an established paradigm of a city development, actively introducing advanced digital technologies in order to improve the quality of life of the citizens, the quality of the services rendered and the efficiency of the managerial processes coupled with the necessary provision of the citizen's needs[13]. Also, the basic directions of implementing this approach in specific municipal entities are identified:

– city environment;
– safe city;
– digital city management;
– investment climate;
– well-being of people.

Abroad, the following directions of smart city are specified[14]:

– smart care;
– smart energy;
– smart society;
– smart office;
– smart mobility;
– smart space;
– smart infrastructure;
– smart transportation;
– smart data.

Integration of various components, like the above listed, may increase the success of such a project. In our opinion, the point of contact here is the life quality of the citizens as one of the main values guaranteed in such a city.

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12 Memorandum on the development of cooperation in the spheres of construction, communal facilities and urban environment with a view of creating "smart cities" between the Ministry of Construction and Communal Facilities of the Russian Federation and the Ministry of Lands, Infrastructure, Transport and Tourism of Japan (signed in Moscow on 26.05.2018). https://minstroyrf.gov.ru/docs/16971/

13 Order of the Ministry of Construction of the Russian Federation No. 866/pr of 25.12.2020. https://minstroyrf.gov.ru/docs/81884/; Passport of the federal project "Forming a comfortable urban environment" (adopted by the protocol of a meeting of the Project Committee on the national project "Housing and urban environment" of 21.12.2018 No. 3). https://www.consultant.ru/document/cons_doc_LAW_319514/

14 Maddox, T. (2016, August 1). Smart cities: six essential technologies. https://www.techrepublic.com/article/smart-cities-6-essential-technologies/; Marr, B. (2020, July 2). The smart cities of the future: five ways technology is transforming our cities. https://www.forbes.com/sites/bernardmarr/2020/07/02/the-smart-cities-of-the-future-5-ways-technology-is-transforming-our-cities/?sh=781277c673f8

2. Content of the "smart cities" concept

"Smart cities" are territories where local innovative systems function, which receive advanced opportunities; this is expressed in increased competitiveness, improved environment, increased numbers of jobs and citizens' well-being (Vukovic et al., 2021; Shkvarya & Semenov, 2020).

The city population, qualified employees and innovative enterprises are the fundamental elements on which this concept is built (Fedorchenko & Karlyavina, 2021). In this regard, it is important to promote the growth of education, incite initiatives and creative activities of the residents, and establish partnership relations. In an environment where smart people work, the emphasis is made on human resources, management of the potential, processing and analyzing data by the people in order to make managerial decisions and implement production processes.

The key directions in developing the "smart city" concept are:

1) comparing the municipalities and electing the best practices;

2) understanding the trends of a "smart city" development, their dynamics, identifying drawbacks and resources for their overcoming;

3) accounting for the local factors influencing the development of a specific municipality;

4) preparing a development plan including the main components;

5) creating a working group of representatives of authorities and the community to control over the project implementation.

The technologies applied may save lives, prevent crimes, reduce waste, save time, and elaborate solutions productive for the city. Another objective is to more effectively and dynamically respond to the challenges, needs and desires of the residents of the territory.

The main principles of the "smart city" concept are:

1) orientation towards a human (this principle is determined by the priority of the rights and freedoms of a human and citizen, the need to provide possibilities for self-implementation of every individual, and to solve their problems at the place of residence through organizing feedback, i. e. the main goal is improving the life quality of citizens);

2) forming a sustainable and safe environment (to the forefront come the safety of residents, ensuring the functioning of the established information networks, comfort of the urban environment, accessibility of social infrastructure; this principle implies active development of public surveillance systems, public and ecological safety, intelligent city illumination; widespread means of photo- and video-registering on roads, developing intelligent transport systems, stimulating development of energy saving systems) (Nizamieva, 2021; Kuranov, 2020);

3) observing the balance of interests, principles of development and possibilities (this principle implies accounting for the public opinion when making significant decisions influencing the urban environment (voting, polling); involving the population into self-organization at the local level, joint implementation of public projects; reaching consensus between the interests of the municipality, business structures, and local residents) (Yakushina, 2021);

4) accessibility and convenience of services (one of the advantages of living in a "smart city"; introduction of this principle is provided by internetization of the city, providing many services via electronic resources (for example, state services portal, electronic offices); it takes into account the needs of various groups of population depending on the age, gender, education, occupation, etc.) (Bekbolat et al., 2021);

5) integration, interaction and openness (this principle refers to the mechanism of functioning of city services, implying collection and analysis of all necessary data, exclusion of their dubbing, their transfer to stakeholders) (Belov & Smirnov, 2018);

6) constant improvement of the quality of management (the principle is implemented through the functioning of highly professional officials, first of all, managers; analyzing problematic aspects; creating data bases and registers complying to the global standards; using various subsystems in forming rational management) (Sharova, 2019);

7) emphasis on economic efficiency (this principle allows evaluating the investment attraction of the city, its investment climate (presence of business incubators, technoparks, etc.), facilitating creation of new jobs and increasing labor productivity; it implies the need to ensure financial independence of the city through active development of the key directions of investment activity) (Golikova, 2020);

8) predominance of long-term solutions over short-term benefits (this direction ensures economic growth for the future; allows avoiding negative consequences of instantaneous subjective decisions, as it is quality long-term decisions that directly influence short-term steps) (Kostko et al., 2022);

9) using the best available technologies (the principle implies evaluating technology from the viewpoint of cost, difficulty of introduction and feasibility in particular conditions, and the need to minimize negative consequences; it is possible to implement experimental legal regimes).

Depending on the order and objectives of their creation, "smart cities" may, in our opinion, be classified as follows:

– the new cities created artificially, initially built to use new information technologies and attract business structures (Fujisawa in Japan, Neom in Saudi Arabia, Rublevo-Arkhangelskoye in Moscow region);

– the existing cities with a rich history of development, currently undergoing the process of technological modernization as a necessary condition for their further development and adaptation for the forming conditions (London, Moscow, etc.);

– the specialized cities created with a particular goal and in this connection using the process of digitalization in relation to the chosen development direction (business incubator (Silicon Valley in the USA), eco-city (Masdar in UAE, Neapolis in Cyprus, etc.).

Speaking of the foreign experience of introducing the "smart cities" concept, one may highlight the following significant aspects.

Since 2019, the Federal Ministry of Transport, Construction and City development of Germany (BMWSB) promotes German cities and municipalities in terms of their planning and implementation of "digital strategies for liveable cities", with financing called "Smart cities made in Germany". In 2019, 13 cities and municipal projects were financed, in 2020 – another 32, and in 2021 – another 28 projects. In addition to elaborating and testing the integrated approaches to a "smart city", the objectives of this program are a combination of sustainability with digitalization, development of cloud infrastructures and services of the new generation (Treude et al., 2022).

Italy focuses on introducing applications and intellectual systems. Development of applications includes construction platforms, open source technologies and city data platforms. When designing the systems, special attention is paid to developing auxiliary systems, efficiency of transport systems, facilitating the transformation of vulnerable territories into "smart" and sustainable areas.

Great Britain makes an emphasis on applications and management, including development of joint innovative platforms, data safety and projects of transport infrastructure. The main activity is aimed at city administrators and development of services using mobile data. In particular, London plans to become a global city – a testing ground for innovations, where the best ideas, for example, from the sphere of artificial intelligence, are elaborated in compliance with the highest standards of confidentiality and security, and are disseminated all over the world.

Thus, green spaces, possibility of quick employment, availability of schools and safety of citizens are the key factors determining the European smart cities. The policy for the coming years in the sphere of "smart cities" takes into account the main components of their development and is an end-to-end task in the field of digitalization of state and municipal services and an in-depth reform of promoting business models and product marketing. Connectivity and safety of digitalized system will also form the behavior of the population through their inclination towards digital components and intelligence, which ensures sustainability, adaptive and future-oriented evaluation of risks (Apostu et al., 2022).

3. Practice of introduction of the "smart cities" concept

In order to activate the use of modern digital technologies, the states arrange various contests with prize funds.

In Russia, there is an annual contest "The best municipal practice", including a nomination related to integration of digital technologies or platform solutions for improving municipal facilities, i. e. what makes the basis of a "smart city" functioning[15]. This contributes to the accumulation of the best practices. The contest offers a prize fund of 200 million rubles in this nomination.

[15] Order of the Ministry of Construction of the Russian Federation No. 368/pr of 09.07.2020. (2020). *Official Internet portal of legal information*. http://www.pravo.gov.ru

The number of applications grows every year, which ensures involvement of various types of municipal entities (in 2020, 59 applications from 28 Russian subjects were submitted, in 2021 – 95 applications from 39 regions, and in 2022 – 101 applications from 41 regions).

To select among the applications, 58 criteria are used, including:

– the prospects for reproducing in other municipal entities;

– the possibilities for the local population participation;

– the degree of advanced technologies introduction;

– the interrelation between the practice implementation and the IQ index growth;

– the compliance with the current normative legal acts in the sphere under study;

– the possibility to resolve the problems existing in the municipal entity, etc. (Antonova, 2020).

For example, in 2021, the contest winners were Kaluga (organization of automated dispatcher service of "Kalugaoblvodokanal" state enterprise) and Strigunovskoye rural settlement of Borisovskiy region of Belgorod oblast (introduction of "Memorial" – an interactive database of the existing cemeteries)[16].

The most popular trends among the contest participants are:

– forming digital platforms or creating services of feedback with the local residents in the sectors most demanding them;

– modernizing the functioning of energy, heat and water supply networks, associated with the local issues under the authority of local self-government bodies.

Speaking of the global contests, one should mention Intelligent Community Awards[17] and AI City Challenge[18].

Intelligent Community Awards annually marks the contributions of territorial entities, intellectual communities and partners from public and private sectors. The program pursues two goals: to mark the achievements of communities in developing the inclusive flourishing based on information and communication technologies and to collect data for ICF research programs.

AI City Challenge was founded to stimulate development and use of artificial intelligence in urban environments. This is manifested, for example, in improving transportation by increasing the efficiency of road traffic and safety, improving the processes of exploiting buildings by increasing their energy efficiency, reducing collapses in retail by speeding up servicing at the cash register, etc. The common point for all those various solutions

16 Tikhaleva, E. Yu. (2022). Using digital technologies at the modern stage of reforming local self-government. In: *State and municipal governance in Russia: status, problems and prospects*. Works of the All-Russia scientific-practical conference (p. 150). Perm: Perm branch of RANEPA.

17 *Intelligent Community Forum*. https://www.intelligentcommunity.org/awards

18 *AI City Challenge*. https://www.aicitychallenge.org

is extracting useful information from multiple sensors by online streaming and package analysis of bog data (surveillance data).

Besides contests, governments may create websites demonstrating promising solutions in the sphere of introducing digital technologies, which particular cities use in any convenient form.

In the Russian Federation, one example is the Internet resource "Bank of solutions for a smart city"[19], comprising projects in the main directions of social life development (residential-communal, transport sphere, etc.). This refers to simplifying the processes of infrastructure management (development of automated software), reducing costs for city facilities servicing (control automation), or simplifying citizens' life (smart road crossing). The website contains passports of projects, which show the project content (its plan, including areas of implementation, the possible result of implementation (estimated and actual), the required functional properties, the developer), the period required for implementation, the financial costs, and the project integration in particular structures.

The leader in implementing these technologies in the Russian Federation is Moscow (in 2020 – 56th position in the global ranking of "smart cities"; 44th position in the ranking of smart cities by Z/Yen Group Limited (ranking of business activity of municipal entities)) (Esayan & Truntsevskiy, 2020). This is logical and reflects the trends forming in the global community. Apparently, the most advanced technologies are concentrated in capital cities (the examples are London and Seoul (Lee & Nam, 2021)).

For example, in London, within the "smart city" concept, such projects are supported as Barclays Cycle Hire (an application with which citizens may receive information about the availability and use of hired bicycles), Listen London Platform (a social networks application for listening to the cities topical problems), Love Clean London (a service in which citizens may inform the authorities about the drawbacks related to the cleanliness of the London streets and parks), etc.

Also, the Russian Ministry of Construction annually forms the IQ ranking of cities, which implies identifying the cities achieving the greatest success in digitalization. It uses 47 indices divided into 10 groups. Special attention is paid to balancing the indices, as high values in a separate group do not always testify to the efficiency of using digital technologies in general. As a result of 2021, Moscow receives the highest IQ index among the large cities (over one million people), and the city of Sarov in Nizhegorodskaya oblast – among municipal entities with less than one hundred thousand people[20].

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[19] Smart city: departmental project of the Ministry of Construction of the Russian Federation. https://russiasmartcity.ru

[20] Tikhaleva, E. Yu. (2022). Using digital technologies at the modern stage of reforming local self-government. In: *State and municipal governance in Russia: status, problems and prospects*: works of the All-Russia scientific-practical conference (p. 151). Perm: Perm branch of RANEPA.

However, one should note that, in compliance with the federative structure of the country, Moscow has the status of a city of federal significance; hence, stemming from the Russian Constitution, it is a subject of the Russian Federation. In this research, we accentuate the analysis of development of municipal entities, first of all, urban districts.

Speaking of international rankings, one should pay attention to Smart City Index (developed by IMD's World Competitiveness Center (WCC) join forces with the Singapore University of Technology and Design (SUTD)), taking into account both economic and technological indicators: mobility, safety, prospects of development, etc. (the total of five groups of indicators divided by the respective criteria). As a result of 2021, Moscow ranked 54th and Saint Petersburg 79th[21].

The ranking of technological cities of the future is developed by an analytical agency fDi Intelligence, taking into account the infrastructure development and the ability to attract investments[22].

The strategic and consulting bureau Eden Strategy Institute annually publishes the ranking of Top 50 Smart City Government with three groups of indicators: sphere, scale and integration[23].

When implementing a "smart city" concept, it is expedient to the benchmarking (etalon estimation) technologies, modeling and ranking methods (Kamolov et al., 2022).

Benchmarking has been rather broadly used recently. This technology is based on comparing the significant aspects of a specific type of activity with the competitors' results, which is very promising in relation to implementing innovations in municipal entities. It implies constantly searching for new ideas, their actual adaptation and further using in practice with a view of improving own performance. Benchmarking can be also viewed as a tool of control (the main methods are evaluation and comparison, i. e. statistical methods) (Xu et al., 2022). At that, it is important to precisely define the parameters used for comparison, the objects suitable for analysis, the practical opportunities for adaptation, and the desired results. In this regard, there is comparative benchmarking (orients toward the planned changes judging by the level of municipal entity development compared to the leaders in the respective sphere) and procedural benchmarking (implies improving the activity in practical terms, through selecting the necessary set of tools to achieve the goal) (Moustaka et al., 2021).

Benchmarking is a consecutive implementation of a number of procedures; it must be systematic, thus, it cannot be used in a single situation. Most often, this technology includes such stages as:

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21 Data shows effects of COVID-19 and climate change on citizens' perceptions of how 'smart' their cities are. (2021, October). IMD. https://www.imd.org/news/updates/data-shows-effects-of-covid-and-climate-change-on-citizens-perceptions-of-how-smart-their-cities-are

22 *FDI Intelligence*. https://www.fdiintelligence.com

23 *Eden Strategy Institute*. https://www.edenstrategyinstitute.com

– reengineering (implies a complex approach to solving the existing problems through monitoring, understanding the need to reconsider the current managerial processes and their quality reorientation towards a particular result) (Saragih et al., 2021);

– reaching a certain level of characteristics of competitiveness of a municipal entity;

– analysis and evaluation of various options in the municipal entity development based on the available positive experience of competitors;

– selecting a specific way of improving the municipal entity with a view of raising particular indicators.

Modeling allows objectively evaluating the current condition of the municipal entity with a view of satisfying the needs of its residents, and to forecast the use of the available potential to reach the goals. It allows using innovations combined with digital technologies on the condition that the information received is implemented in a complex and systematized manner and the technologies are introduced based on the specificity of activity of the particular city.

The method of ranking in relation to the "smart city" development implies the possibility to objectively estimate the activities of all elements of the "smart city", reveal the existing drawbacks and find ways to eliminate them. This method is aimed at increasing the ranking of a particular municipal entity among "smart cities". In this regard, it is possible to involve experts and analysts to perform respective works, which may be difficult to implement at the local level due to limited resources. That is why, such specialist may work as a public service.

Another important indicator of effective introduction of the "smart cities" concept, complying with the future requirements, is, in our opinion, their sustainability, including the following:

1. The current social-economic development determined by a road map of the community with a view of local sustainable development and reasonable policy, facilitating investment initiatives and integrated centers for the local growth from strategic viewpoint.

2. Supporting the development institutions which use the specificity, authenticity and potential of development. For example, not all industries sufficiently use the natural and anthropogenic potential and increase the value of the existing human capital and demographic support both by increasing the local population and mobility (internal mobility or immigrants).

3. Encouraging foreign investments to accomplish/diversify economic and social activity, as well as to preserve and develop the local qualified workforce.

4. Proper management at the local level should include, at least, three components: digitalization; reasonable development of public services, transport and communication, and quality of life.

5. The healthcare network supervised by the local community must be focused on the services improving quality of life in a megalopolis and the districts of regional impact,

specializing in the risks of zonal medical diseases, in order to assist public-private and municipal partnership in the sphere of preventive, therapeutic and rehabilitation medical services, to complement the network of healthcare services of national or international significance.

6. The educational network must maintain high quality of education in the spheres of specialization demanded by the local and regional labor markets, in order to retain the younger generation with attractive jobs, temporary or constant, as an alternative to external migration. University education and continuous education services must ensure integration into the national educational network as a center for advanced experience in the sphere of professional training or specialization. The educational sector must facilitate links between educational establishments and business by means of scholarships, probation periods and preliminary training before employment, as well as due management of structural demand in the labor market.

Apparently, in parallel with municipal programs on forming "smart cities", it is necessary to implement programs on energy saving and increasing energy efficiency, and forming the modern city environment[24].

Unfortunately, ideal solutions are usually hard to implement. Accordingly, introduction of the "smart cities" concept is accompanied with problems emerging when certain results are obtained.

Speaking about the obstacles faced by the development of "smart cities" in Russia, these include (Abramov & Andreev, 2022):

– governmental grants in most municipal entities (Snyrenkov, 2019);

– deficit of local qualified personnel;

– passivity of the local population and authorities, reluctance to introduce innovations;

– the existing gap (inequality) between large cities and small municipal entities, which does not allow the latter to fully use the scientific-technical achievements due to the lacking access to digital technologies (Molchanova, 2019);

– underestimated complex approach to implementing the goals of "smart cities" formation, the lack of the necessary coordination of activities, isolation of the intellectual systems used (Malchenko, 2020);

– long-term projects implemented.

Conclusion

"Smart cities" imply creating a certain industry in the sphere of information and communication technologies, a mechanism of interrelations between authorities and the population, and the use of modern digital technologies in everyday urban life.

[24] Khudzhatov, M. B. (2022). Municipal programs. *SPS KonsultantPlyus*.

"Smart city" may generate various private initiatives and partnerships, but usually it functions under the aegis of a municipality. City authorities are the main driving force of the "smart city" activity; this said, usually the authorities and private technological corporations have close relationships. "Smart city" innovations ultimately serve as a superstructure of the local self-government: they ease the work of a municipal administration, rendering public and municipal services and relations between officials and citizens. That is why the advanced forms of immediate implementation of local self-government (initiatives, crowdfunding) may become a support in the development of the phenomenon under study.

Therefore, a "smart city" plays the role of an ecosystem determining convenient and safe living conditions for the people. A "smart city" may be viewed as a city, effectively working in the promising directions of economy, management, transport mobility, ecology, built on a reasonable combination of the authorities' regulations and the activity of eager residents aware of the problems of their city.

Thus, the main goal of implementation of the ideas under study is improving the life quality of the population (achieved by providing a constant interaction between the local authorities and the population, involving the latter into solving the topical problems at the local level in real time mode and rendering maximal services to the population) and the quality of city management (achieved by introducing advanced digital and engineering solutions and optimizing the use of the existing resources).

Today, "smart cities" offer attractive prospects, strategy and relevant view into the future, operatively trace and integrate the status of the crucial systems of their infrastructure.

Having analyzed the basic legal acts determining the essence of the "smart cities" concept, we may conclude that most of them are of sublegislative and scattered character and include the main criteria of referring certain territorial entities to "smart cities". In this regard, we consider it necessary to adopt a common federal law in the Russian Federation, which would stipulate a complex approach and standards of "smart cities" regulation (stipulate the key notions, goals and spheres of development, competencies of authorities at all levels).

The "smart city" concept, in our opinion, is a promising direction of improving the institute of local self-government, facilitating the implementation of such basic principles as people's rule and independence from other authorities. This may also raise the credibility of the authorities through openness of their functioning for the residents, which is considered necessary nowadays to carry out research in the sphere of both constitutional and municipal law.

The imperative of well-being and improved life quality in the context of "smart cities" may be reached only if the intelligent services, playing such an important role in the "smart cities" concept, correlate to the needs, expectations and skills of the city residents. Given

that the Internet of Things generates and opens access points to huge amounts of data in real time mode, referring to well-being and life quality, such as citizens' opinions, as well as to the latest events related to normative-legal basis, debates, political decisions and elaboration of not only federal but also municipal policy, the promising directions are: transformation of the immediate forms of local self-government into electronic format; using the potential inherent in this system to improve efficiency of management, implemented in "smart cities", all over the state.

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«Умные города»: правовое регулирование и потенциал развития

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Ключевые слова

Законодательство,
местное самоуправление,
муниципальное образование,
муниципальное право,
право,
правовое регулирование,
умный город,
цифровая платформа,
цифровизация,
цифровые технологии

Аннотация

Цель: исследование тенденций развития концепции «умных городов» и их правового регулирования.

Методы: в работе использовались общенаучные (индукция, дедукция) и специальные (системно-структурный, сравнительно-правовой анализ) методы. Кроме того, в исследовании применялись методы обзорного анализа, чтобы изучить статус-кво для «умных городов». До сих пор инновационные исследовательские подходы в рамках рассмотрения концепций «умного города» встречаются редко, как и перспективы, касающиеся целевого управления знаниями и сотрудничества соответствующих заинтересованных сторон. Если говорить о специальных методах исследования цифровых отношений, был использован контент-анализ (метод создания воспроизводимых и обоснованных выводов из текстов (или другого значимого материала) в контексте их использования). Поскольку результаты предыдущих исследований и концепций, касающиеся «умных городов», доступны, также применялся дедуктивный контент-анализ.

Результаты: дана характеристика общественных отношений, складывающихся в процессе развития концепции «умных городов». Обозначены ключевые правовые акты, принципы формирования и функционирования «умных городов» с учетом российского и зарубежного опыта. В связи с этим приведены примеры успешных практик из деятельности как российских, так и зарубежных муниципальных образований с учетом проводимых конкурсов, и рейтингов, определяемых центральными структурами. Обобщены популярные направления, широко внедряемые на местном уровне, и выделены возможные проблемы реализации данного проекта в нашем государстве.

Научная новизна: в статье осуществлен анализ имеющегося правового регулирования, а также результатов внедрения концепции «умных городов». Определены перспективные технологии и методы, необходимые для достижения целей реализации концепции. Выделены элементы, обеспечивающие устойчивость «умных городов», отвечающих требованиям будущего. Высказана авторская позиция о тесной взаимосвязи данного явления с институтом местного самоуправления в контексте возможного развития последнего с подключением искусственного интеллекта в процесс по принятию управленческих решений. Прежде всего речь идет об использовании потенциала интернета вещей. На практике возникает немалое количество проблем, связанных с реализацией нормативно закрепленных положений, что подразумевает необходимость проведения дальнейших научных исследований в анализируемой сфере.

Практическая значимость: обусловлена недостаточной разработанностью данных об особенностях и перспективах внедрения идеи «умных городов». Положения проведенного исследования позволят осуществлять эффективную работу по совершенствованию механизмов правового регулирования рассматриваемой концепции и ее повсеместному распространению.

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