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THE SMART CITY CONCEPT IN RUSSIA: PROBLEMS OF TRANSITION AND HUMANIZATION OF THE DIGITAL ENVIRONMENT FROM THE PERSPECTIVE OF THE QUALITY OF PUBLIC ADMINISTRATION

Abstract: *The article provides a comprehensive possibility analysis of implementing the "smart city" concept in Russia and substantiates the pivotal role of the quality of public administration in this process. The purpose of this research is to assess the readiness of Russian regions to use "smart" technologies to solve the socio-economic problems of spatial development in the context of the "smart city" concept from the perspective of the quality of public administration. The research methodology includes neo-institutional and systematic approaches, as well as the analysis of the statistics and social research data. The research equally considers the theoretical and applied aspects of the presented article. The article reveals that the central role for successful implementation of the concept is played by the human capital and society's readiness to change, the infrastructure base, sustainable interaction of the state structures, the scientific and technical institutions, and entrepreneurship. Their successful management determines the quality of public administration.. The contribution of the paper to academic literature consists in the substantiation of the pivotal role of a qualitative factor – the quality of public administration – in the factor system of creation and development of smart cities.*

Keywords: *The Smart City, The Digital Economy, The City Management, The Digital Technologies, Russia, Quality of Public Administration*

1. Introduction

The growing number of urban residents (Leeson, 2018), the health problems (Corburn, 2017), environmental degradation (Pickett et al., 2011), the crime rates (Wang et al., 2016), the access to social services (Amaba, 2014) and improving the comfort level of the living environment (Sedov et al., 2016) are just some of the problems and challenges, which present cities collide. Successful resolution of these problems is determined by the quality of public administration. The search for adequate and effective models of spatial development, designed to ensure the stability of the territorial system, to increase its competitiveness by activating the endogenic resources, and to increase technological capital in a competitive environment, is an

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urgent task of urban management. In the context of declining effectiveness of the traditional approaches to the strategic planning of territorial development, which assume "manual" management of the regional potential and do not take into account the technological progress in the system of territorial management, there is a necessity to reconsider the strategic management methodology of territorial development, taking into account the high variability of the external environment and dynamic development of new technologies in all areas of socio-economic life of the present cities (Porter et al., 2004)

The attention of the scientists and politicians has been focused on the question about the sources of effective urban development for several decades (Caragliu et al, 2011), where the quality of the provided goods and services has a significant impact on the quality of their resident's life. Increasingly, the social capital (Nahapiet and Ghoshal, 1998), knowledge (Inkpen and Tsang, 2005), and the advanced technologies (Pérez-delHoyo et al., 2016) are recognized as the most important factors that maintain the development of the present cities.

Scientists-economists currently calculate the price of operating cities' expenses, which will be charged in the long term, in the form of cost of the public services of urban transport, lighting, waste disposal, security, and the city residents are the same. Adaptation to the modern requirements of urban development assumes reaching a fundamentally new level of urban management, which allows taking into account both technological and social factors, and at the same time, forming effective strategies for the development of a city.

One of the most cost-efficient urban planning concepts of the present time is recognized as the concept of a "smart" city (Khatoun and Zeadally, 2016), aimed at managing the city, using the latest digital technologies, in particular the information technologies, according to the environmental principles (Sikora-Fernandez and Stawasz, 2016), while maintaining the trend towards saving resources and achieving the set goals of city development.

Several Russian regions have already started the implementation of this concept and have been actively implementing the smart technologies in their infrastructure (Mokrushina, 2017), increasing the level of services, provided to the population, and making the lives of the local population more convenient and safer. However, this process does not proceed equally and with varying degrees of efficiency (Volkov, 2015). The hypothesis of this paper is that the poor quality of public administration is a barrier to creating and developing smart cities in Russia. The purpose of this research is to assess the readiness of Russian regions to use "smart" technologies to solve the socio-economic problems of spatial development in the context of the "smart city" concept from the perspective of the quality of public administration.

The novelty and originality of the paper consist in rethinking the essence of the transition to smart cities, which in this paper is presented for the first time not only as a function of scientific-and-technological advance (quantitative factor), but also as a function of the quality of public administration (qualitative factor). This paper has for the first time revealed the significance and substantiated the pivotal role of the quality of public administration in the transition to smart cities.

2. Literature review

Cities' development led to a paradigm change in the twentieth century, attracting attention to the research and creation of "smart cities" with the direct participation of the industrial and political organizations, the practitioners of the scientific community. Although information technology and communications have advanced

exponentially and smart cities have become a reality, this concept is still under development (Mircea et al., 2017). When talking about technologically developed cities, it is used the terms: “smart city”, “energy-efficient city”, “green city”, “eco-city”, “digital city”, etc. However, most scientists have recently used the term “smart city”.

Optimization of the strategic management of large cities in the conditions of the modern development of an economic system is a prerequisite for the integration of the “smart city” concept. There are different interpretations of the term “smart city”. The United Kingdom Department of business, innovation, and skills (BIS) consider smart cities to be a process, rather than a static result, in which increased citizen participation, strong infrastructure, social capital, and digital technologies make cities more livable, sustainable, and better able to respond to economic challenges (BIS, 2013). The British Standards Institute (BSI) defines the term as “effectively integrating physical, digital, and human systems into a built environment to ensure a sustainable, prosperous, and inclusive future for its citizens” (BSI, 2014). IBM defines a "smart city” as “a city that independently links all available information to control and optimize the allocation of limited resources” (Cosgrove, 2011). Falconer and Mitchell (2012) define “smart cities” as “scalable solutions to improve the quality of life, reduce costs, and increase efficiency by taking advantage of information and communication technologies (ICTs)”.

United Nations Economic Commission for Europe (UNECE) and the International Telecommunication Union (ITU) defined “smart city” as follows: “a smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve the quality of life, efficiency of urban activities and services, and competitiveness, while meeting the needs of present and future generations concerning economic, social, environmental, and cultural aspects” (EURO CITIES, 2018).

According to the Manchester Digital Development Agency, a smart city is based on “smart citizens” who have the necessary information to make informed decisions about their lifestyle, work, and travel options in a digitalized environment (Centre for cities, 2014).

Glazychev understands “smart city” as the image of an ideal city, the approaches to implementation of which are always improved depending on changes in the external environment (technological, economic, social, political, etc. conditions); “smart city” is an attempt to reform cities following the needs of modern society (Minstroy RF, 2019).

The Ministry of construction and housing and communal services of the Russian Federation defines a “smart city” as “a city that implements and uses a set of advanced digital and engineering solutions and organizational measures aimed at achieving the maximum possible efficiency of the resource management and service provision, to create on its territory sustainable favorable conditions for living and staying, the business activity of current and future generations” (Ministry of Construction and Housing and Communal Services of the Russian Federation, 2019).

Thus, the term “smart city” can be interpreted widely and in different ways. But in any interpretation, the key role is given to the information and telecommunications technologies that help to solve the public problems in the framework of a multi-stakeholder partnership between citizens, business, and government (European Parliament, 2014; Government of the Russian Federation, 2014).

In the existing literature, in the study of factors of creation and development of smart cities, the primary focus is on the quantitative factor – scientific-and-technological advance, which can also be found under the term “digital development”.

Digital development assumes a well-thought-out infrastructure, and readiness for natural or artificial population growth, which creates congestion of all the subsystems serving the city. The components of the digitalization process are the government agencies that use the smart city technologies to provide services with higher efficiency and better transparency; business organizations that are interested in smart cities to obtain economic benefits; citizens – the end customers of the digital services offered by the smart city (Lytras et al., 2018).

Cities are spaces where social networks intersect and resources are shared, and in most cases a citywide technology cluster is created that oversees the development, piloting, and scaling of urban projects. Development of the intelligent systems in the "smart" city can lead to an agglomeration effect and be used as a source of economic development in the region. In this case, attention is focused on the growth of labor productivity and the diffusion of innovations, which is facilitated by the formation of industrial areas and the management of socio-economic conflicts (Mukhametov, 2019; Lombardi et al., 2012). The concept of "smart city" has become more widespread in the context of urbanization, as it could provide a basis for solving social problems.

Despite these advantages, the concept of the "smart city" is criticized by some urbanists and urban planners for utopianism, underestimating the city as a self-regulating social system, and using technology to increase centralized control (Hollands, 2015; Greenfield, 2018).

All contradictions and negative factors are formed due to the overpopulation of cities, which occurs due to the influx of residents from rural areas and agglomeration, and lead to the interaction of unequal components of society, creating some problems: the loss of regional identity in shaping the architectural appearance of the city; unresolved problems with providing social housing in connection with lobbying for the interests of the commercial organizations; differences in the lifestyle of citizens and rural residents; surveillance of city residents, which creates a sense of discomfort among urban residents.

According to Adam Greenfield, "there are two myths that accompany the concept of a smart city. They should be immediately dispelled and never returned to them. The first is sustainability". In other words, the city does not rely on its capabilities. "The second myth: urban resilience". That is, the security of citizens of a different class is not taken into account (Alekseeva, 2019).

Based on this, when designing new cities or implementing smart technologies in existing cities, it is necessary to take into account the local design features and the way of personal life in a particular region These are quantitative factors that are determined by the quality of public administration and are understudied, which is a research gap. The issues of public administration are discussed in works by Chiang (2021), Dat et al. (2020), Díaz et al. (2020), Kuklin et al. (2021), Milchik et al. (2021), Pan et al. (2021), Shebaninaetal. (2021), Sukmanaetal. (2021),; however, they do not take into account the specifics of the quality of public administration with regard to smart cities. This paper aims to fill the identified research gap through the study of the role of the quality of public administration in creation and development of smart cities through the example of Russia.

3. Methodology

To study the Russian experience of using "smart" technologies in the development of the economic potential of territories, an Internet survey (questionnaire) was organized and conducted using the online application "Google Forms". The choice of the survey format was due to the inability to conduct face-to-face meetings and interviews with respondents due to the

various circumstances, as well as the need for the geographical diversification of participants. The advantage of the chosen method of survey is the possibility of the most complete, reliable and in-depth study of the qualitative factor – the factor of the quality of public administration – as determinants of creation and development of smart cities. The total sample was 201 people from ten regions of the Russian Federation. The survey was conducted from 11 March to 26 April 2019.

The questionnaire was divided into three parts. In the first part, respondents answered general questions (the gender, age, the city of residence, the level of education, and the type of activity) that gave socio-demographic characteristics of the survey participants. In the second part of the questionnaire, respondents were asked to allocate no more than 5 major issues of socio-economic development, typical for the city of their permanent residence, as well as to assess the quality of functioning of the basic sectors of their territories, on a scale of five (where 1 – very bad, 5 excellent). In the third part, the questions were presented to find out the level of respondent awareness about the concept of "smart city" and the possibility of solving existing problems of urban development using digital technologies. In addition, there were identified constraints to the introduction of "smart" technologies in the process of managing the development of Russian cities.

4. The digital transformation of Russian cities

4.1. Prerequisites for implementing smart city technologies and technological initiatives aimed at comprehensive modernization in Russian cities

Russian projects in the field of digital cities transformation, as a rule, affect such areas as electric power, transport and mobility, and public security. Existing initiatives, however, are mostly local and cover a narrow range of infrastructure modernization tasks. As for large-scale transformations of the management system throughout a city, at the moment in Russia, such projects are implemented only within the framework of Greenfield initiatives.

One of the most dynamically developing segments of the smart cities in Russia is services that ensure citizens' participation in shaping the urban development agenda. Another promising segment in the field of local solutions projects for the intellectualization of the individual components of urban infrastructure can occur during the initial stage of the digital cities transformation and will not require significant additional costs and technology imports.

The second group includes solutions, which are based on the indicators of the patent activity, and this group has been developing much more slowly in Russia than in the leading countries. These are technologies of smart homes, smart transport (including vehicles connected to infrastructure, connected vehicles), in the field of energy, heat, and water consumption control (including in the field of regulating electricity demand, distributed solar energy, managing changes in the load on the power grid, smart transformers, micro-networks), smart medicine (including connected medical devices, health information systems, remote patient monitoring, telemedicine, etc.)

4.2. Digital Transformation Scenarios

The conducted research may indicate that implementation of the smart city concept and digital transformation can be accepted by Russian cities as a target model. This is for several factors at once. Firstly, in the large cities, there is a real demand for the introduction of new-generation technological solutions and products that help to solve critical problems, improve the efficiency of the management of the urban system, and improve the quality of citizens' life. At the

same time, the implementation of the smart city concept is not the end in itself, but it is positioned as an effective tool to oppose the challenges, faced by the cities and their residents. It should be emphasized that new technologies are particularly important in the context of reducing the negative impact on the urban environment, ensuring safety, and improving management efficiency at the municipal level.

Secondly, the transformation to smart cities is accepted as one of the key elements of a larger initiative to create a digital society and economy in Russia. The digital transformation, unfolding in the world, affects the key industries and areas that, on the one hand, are concentrated in cities, and on the other hand, are essential elements for ensuring their life. Modern production, transport, and mobility, energy, communications, housing and utilities, trade and services, health, education, municipal management systems – that means implementation of the specific projects in these areas at the city level has a significant potential for scaling up at the level of the entire country.

Third, the role of the state in institutionalizing the theme of smart digital cities is important. The discussion in this direction within the research of options to extend the implementation of the "Digital Economy of the Russian Federation", approved by the Government of the Russian Federation in 2017, and the establishment of a core working group under the Ministry of construction of Russia intended to draw the attention of cities, expert and scientific community and citizens to raise the subject.

It should be noted that in the absence of successful cases of complete implementation of the smart city concept in world practice, Russia could claim to be the leader in this area if the relevant program is launched and implemented promptly. In addition, it is necessary to take into account the fact that the digital transformation of the city includes work on several groups of promising areas of the new technological revolution. In this regard, the basis gained as a result of the development and implementation of domestic solutions in the field of smart can be further applied to solve other problems of a scientific and technological nature. However, the question of the possible scenarios for launching the processes of intellectualization and digital transformation in Russian cities remains open.

Implementation of the smart city concept and the digital transformation in Russian cities can be implemented following the various action models – scenarios, distinctions between which lie in the field of the quality of public administration. They differ depending on who is the main interest, subject, and "investor" in the processes of intellectualization and digitalization of urban development. These players can be businesses, local governments, associations of the various stakeholders (consortiums, citizens and their associations, etc.). Depending on the main subject, the basic motive for implementing the concept of a smart city and implementing technologies differs. This can be a goal either to reduce costs and save money (if the main subject is the city administration) or to make a profit and expand sales markets (if the main subject is a business).

As a result, these characteristics will significantly influence the role of the state in the process of intellectualization and digital transformation of cities, the nature of public policy, the priority systems, and the program of action. Depending on the main subject, the following options (models) for implementing intellectualization and digital transformation for Russian cities are identified: decentralized, centralized, and local. Each scenario can be described using the following characteristics: the main subject/ interest of the digital transformation, the main priorities in implementing the smart city concept, the prevailing nature of activities, the dominant type and the project direction being implemented, the nature of data ownership and disposal (owners, degree of openness, nature of access provision).

5. The opportunities analysis for implementing the smart city concept in Russia from the perspective of the quality of public administration

5.1. The barriers to the development of smart city technologies from the perspective of the quality of public administration

For the active implementation of smart city technologies in Russia, first of all, a favorable regulatory environment must be created. That is, favourable circumstances in the regulatory environment for creation and development of smart cities are some of the key characteristics of the quality of public administration. At the same time, many experts consider the lack of a legal framework for applying some basic technological solutions to be one of the significant obstacles to the development of these technologies (PWC, 2017). For example, one of the key issues is data protection in global networks and the invasion of privacy by the Internet of things.

Barriers to the development of end-to-end smart city technologies are significant for all categories of players, interested in developing appropriate solutions, determining the quality of public administration, are presented further in this paper.

5.1.1 Standardization

First of all, attention is attracted to the low level of saturation of the regulatory technical base (the national standards) in the field of cyber-physical systems technologies (in the broad sense of the word, including the Internet of things, big data, smart cities, smart manufacturing, etc.).

The lack of a smart city standards system is one of the key barriers. In terms of cyber-physical systems, experts note that Russia does not have, among other things:

(1) Common terminology in the field of the key aspects of the digital economy based on the cyber-physical systems (including the Internet of things, big data, etc.).

(2) General requirements for the architecture of the key aspects of the digital economy based on the cyber-physical systems (including the Internet of things, big data, etc.);

(3) Common exchange protocols for the key aspects of the digital economy based on the cyber-physical systems (including the Internet of things, big data, etc.).

(4) Unified register of manufacturers and developers in the field of the cyber-physical systems (in a broad sense, including the Internet of things, big data, etc.), as well as in the field of blockchain technology.

(5) Proposals to promote Russian requirements to the international standards in the areas related to the digital economy (including iso, iec).

(6) Certification Systems in the field of cyber-physical systems (in a broad sense, including the Internet of things, big data, etc.), as well as in the field of blockchain technology.

In addition, many experts also emphasize the standards lack that ensures the interoperability of the information systems (the digital boards). For example, in the field of healthcare, under the established rules, registration of wearable devices and sensors for remote monitoring of patient indicators takes at least one year. In logistics, customs clearance and terminal cargo handling also traditionally take a significant amount of time.

5.1.2 Big data

In the digital economy, data and information, obtained from it, are considered as an independent factor of production, allowing influencing its efficiency, labor productivity, reliability, and safety. There is a need to regulate the turnover of data that characterize technical production systems

and processes, occurring in them, to prevent their illegal usage, as well as users without the permission of the data owner (the owner of the production means that generate them).

The existing uncertainty in the relationship between big data and personal data raises the question of the need to obtain the subject's consent for their processing. This is especially critical for technology development in large cities since it is difficult to get all residents to agree at this stage.

5.1.3 Special legal regimes

There is no legal regulation of the so-called "regulatory sandbox", which allows the digital economy entities to test new products, services, technologies, and approaches without potential negative consequences for violations of certain (non-critical) legal provisions. Also, the criteria and transparent conditions for placing projects within the framework of a controlled experiment with the participation of the regulator are not specified.

5.1.3 New tools for attracting funds for the smart city projects

In Russia, there are restrictions on the conducting of crowdfunding (including the crowd-investing and knowledge) and the launch of the appropriate sites for collection and investment of funds for implementation of the urban development projects.

5.2. Barriers to the usage of smart city technologies by municipalities from the perspective of the quality of public administration

Local governments and MUEs (municipal unitary enterprises) are not ready to act as qualified customers for advanced technological solutions. There is no position of the subject about the formation of a program for digitalization and integration of solutions on a city-wide scale.

Limited budget resources of the city administration and MUE, which can be used for the technological modernization of infrastructure. Lack of funds for major repairs due to the regulated tariffs, as well as lack of funding for small and at the same time annually reducing budgets of municipalities. The real revenues of the consolidated budgets of cities do not keep up with the inflation rate.

Lack of ready-to-implement domestic digital platforms that allow effective integration and processing of data from various segments of the urban economy, scalable to the different types of cities, and providing on-demand services.

There are no platform implementation cases on the Russian market that demonstrate real efficiency and scalability, just as there are no large technology and engineering companies that will take the position of a system integrator based on a digital platform. It is also worth considering that the municipalities' it-systems are disjointed and that existing platforms (for example, State Information System of utilities) do not provide business processes for participants while having excessive functionality.

Limitations for the system reconstruction of the existing infrastructure for effective implementation of the digital solutions. When implementing point-to-point digital solutions on existing worn-out infrastructure, the efficiency will be significantly lower than during major upgrades (major repairs, replacement of worn-out objects). At the same time, infrastructure is often difficult to access for modernization and repair (in the field of electricity, water, heat supply), and expensive ownership (increasing operating costs), modernization and implementation of systems lead to an increase in additional costs.

In addition, the limit of the price load on the consumer has been reached. There is a task to maintain tariffs, as the population reacts negatively to the increase in the cost of these services, even if their quality improves.

Tariffs for consumers are high and at the same time unattractive for private investors – the payback period is too long. Tariffs are kept below the level of infrastructure maintenance costs.

Technological modernization of cities within the framework of the smart cities concept is not taken into account in the urban development programs due to the unavailability of the system of digitalizing efficiency indicator. Implementation of the point-based technological solutions does not take into account the potential long-term socio-economic effects that can serve as strategic goals. Only direct savings from implementations are taken into account (for example, fine receipts, reduced energy losses, etc.).

5.3. Barriers for businesses implementing projects and implementing technologies in the field of smart cities from the perspective of the quality of public administration

Several existing technical regulations and standards in the field of urban planning and housing, as well as rules for implementation of procurement procedures, restrict the usage of advanced digital technologies.

There are no national standards for the smart city technology system, including defining requirements for relevant strategies and concepts for smart city development, and outdated snips that do not contain requirements for the usage of modern technologies (for example, in the construction of social infrastructure facilities), it is still in force, which preserves the technical solutions of the previous generations.

On this background, the priority of the price criterion and the low weight of the quality criteria in conducting competitive procedures limit the usage of more effective technological solutions.

Lack of complete, automatically verified, and reliable spatial data in the provision of state and municipal services. As a rule, the initial input (export) of the applicant spatial data, provided to the multifunctional centers or local government, is carried out in some information systems, their verification is possible only in other information systems, and their further usage – in the third information systems. At the same time, the corresponding information systems have different operators, can be state or municipal, and in some cases belong to the legal entities – engineering, network, and transport organizations.

Overcoming these institutional barriers could also contribute to the more effective overcoming of technological, infrastructure, and other barriers and restrictions.

5.4. Analysis of demand for the “smart” technologies in the urban environment from the perspective of the quality of public administration

The research of domestic experience in the introduction and application of “smart” technologies as the main part of the development of the economic potential of territories is an important component of the “smart city” concept. The authors conducted a survey in which representatives of both sexes took part (Figure 1) at the age of 18 to 70 years. The vast majority of respondents have a higher education or a scientific degree of candidate/doctor of science (Figure 2), which indicates a high educational potential of respondents and their awareness of the current level of development of smart city technologies.

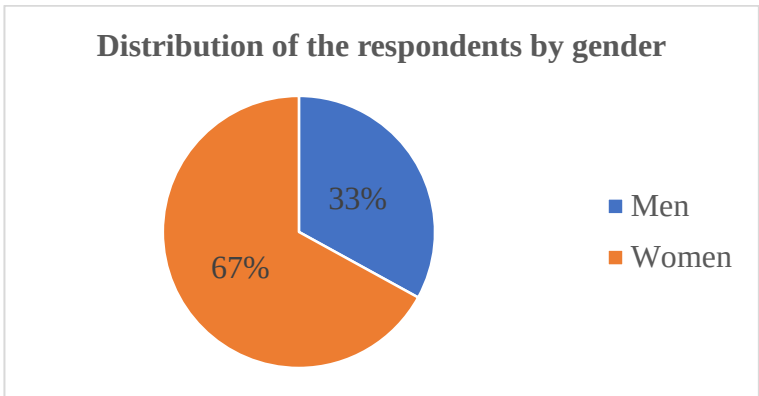

Figure 1. Distribution of the respondents by gender, %
Source: The Author

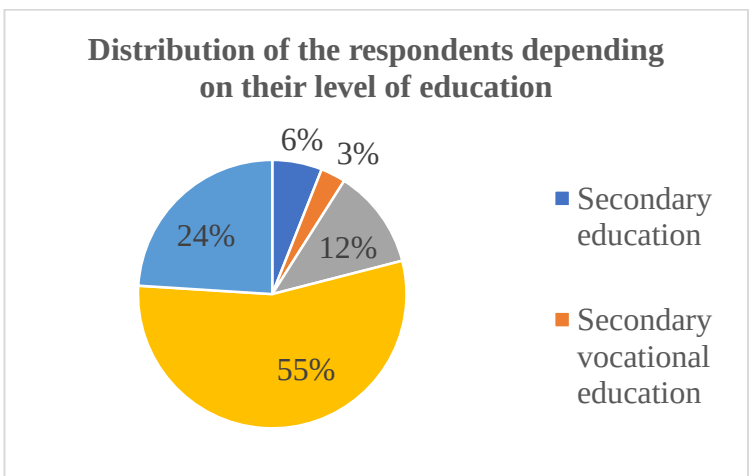

Figure 2. Distribution of the respondents depending on their level of education, %
Source: Authors

The main goal of implementing the smart city concept is to improve the quality of life of the local population. For this purpose, respondents were asked to name the five most acute problems, in their opinion, characteristic of the city of their permanent residence. The responses were received and grouped into four areas: social, economic, infrastructural, and political (Table 3).

The dominating majority of responses (77%) included the most important problems of their cities, problems of a socio-economic nature; it is in the first place. One in three of the respondents mentioned the problems of unemployment, low income of the local population, and underdeveloped urban infrastructure as the main problems of their cities. The problem of corruption and low quality of the municipal services, and low government interest in population problems were mentioned in 45% of answers, which indicates a fairly high level of distrust to local authorities and lack of effective communication between local communities and management areas. This factor may become a constraint in the context of the perception of local government initiatives by the local population to implement the concept of a "smart" city in the practice of spatial development.

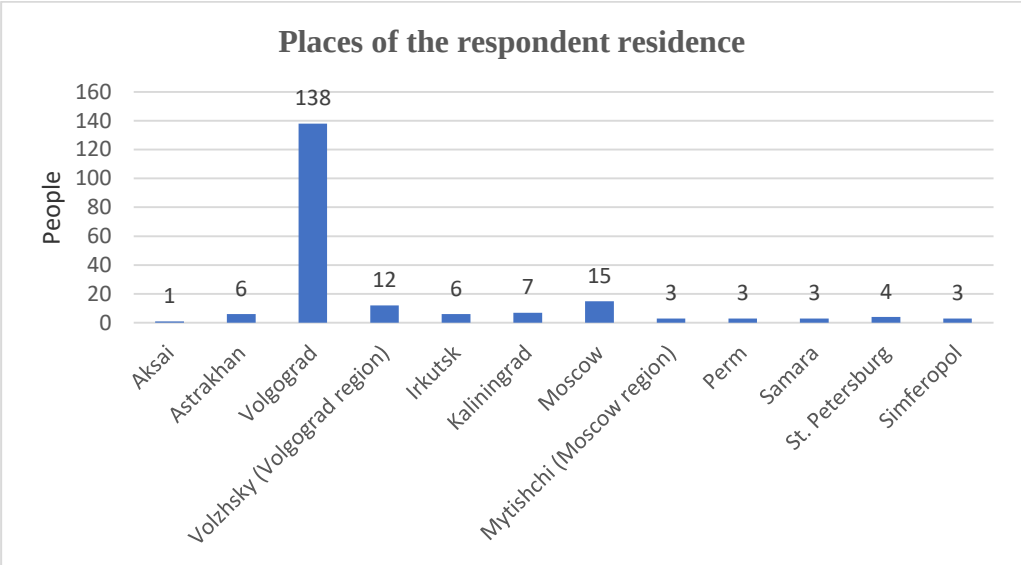

Figure 3. Places of the respondent residence, people
Source: Authors

Table 3. Ranking problems of Russian cities development, that are determined by the quality of public administration

Social problems	Economic problems	Infrastructure problems	Political problems
• poor quality of the medical services provided in the public institutions; • low culture of the population; • drug addiction; • lack of sports and cultural mass state institutions for schoolchildren; • outflow of young people; • expensive housing	• low level of wages; • difficulties with employment; • price increase; • high unemployment rate; • degradation of the industrial potential of the regions; • low level of business development; • insufficient budgetary provision (the deficit of the local budget)	• poor road quality; • deterioration of engineering infrastructure; • poor logistics in cities and intercity areas; • lack of recreational areas and leisure spaces; • problems with recycling	• quality of the municipal (state) management; • high level of corruption; • low interest of the government in the problems of the population; • high level of bureaucracy in the state institutions

Source: Authors

The Central and North-Western Federal districts occupy the leading positions in the rating, presented above, which demonstrate high indicators primarily for two Federal cities – Moscow and Saint Petersburg. The Far Eastern and Southern districts are the outsiders of the digital literacy index, although the latter tends to improve their positions.

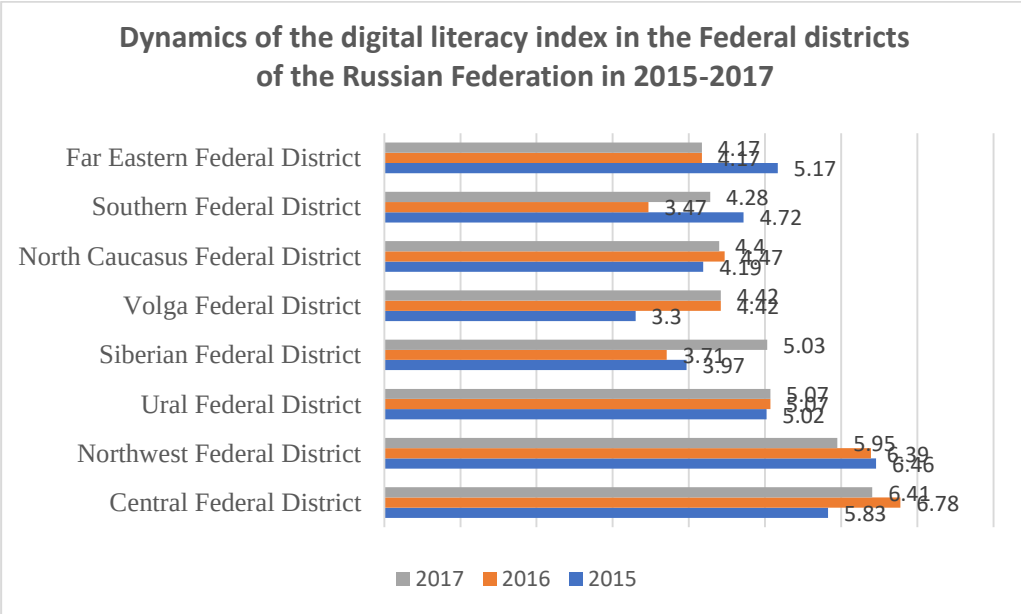

Figure 4. Dynamics of the digital literacy index in the Federal districts of the Russian Federation in 2015-2017
Source: All-Russian study "Digital Literacy Index"

Table 4 Rating of the regions by values of the "ICT in the state and municipal management" sub-index

Rank	Region	Index
1	Moscow	0.556
2	Republic of Tatarstan (Tatarstan)	0.539
3	Chuvash Republic (Chuvashia)	0.532
4	Republic of Karelia	0.531
5	Saint-Petersburg	0.517
13	Astrakhan Region	0.489
21	Rostov Region	0.476
39	Volgograd Region	0.445
57	Republic of Kalmykia	0.413
59	Krasnodar Territory	0.411
65	Republic of Adygeya (Adygeya)	0.399
82	Republic of Daghestan	0.329

Source: Index of readiness of Russian regions for the information society 2013-2014.

The factor of digital illiteracy (Khitskov et al., 2017), according to the authors of this research, is the most significant in Russian conditions. The lack of readiness and inability to use digital technologies in obtaining public goods and managing urban processes leads to the fact that the availability of advanced technological solutions remains in demand both from municipal and regional authorities and from city residents who do not understand how technology can solve the current socio-economic problems of their territories and improve the quality of life.

Corruption as a deterrent factor (Gans-Morse

et al., 2018) to the introduction of "smart" technologies in the practice of managing Russian cities is another significant limitation in the implementation of the "smart city" concept in the regions of the Russian Federation. According to the Corruption Perception Index (CPI) for 2019, prepared by the international anti-corruption movement Transparency International, Russia ranks 144th out of 180 countries (Humanitarian Encyclopedia, 2019). The inefficiency of using resources, primarily money, in the conditions of deficit budgets in most regions of the Russian Federation makes the task of switching to the trajectory of "smart" spatial development impossible. Reducing the corruption component in regional development is a prerequisite for the effective implementation of the "smart city" concept.

6. Conclusion

Based on the research, it can be concluded that the Russian regions did not form a full-fledged social demand for the mass introduction of the "smart" technologies to solve current problems of urban development. The low level of popularization of the "smart city" concept among the territory stakeholders is a limiting factor for the implementation of this concept in most regions of the country. Without mass understanding and approval of the essence and principles of the "smart city" concept by the residents and business structures, all the initiatives of the Federal authorities will remain just a fashionable fun and a set of unstructured events and their implementation will take a formal character without qualitative changes in the socio-economic development of the regions of the Russian Federation. This results from and is indicative of the poor quality of public administration.

In our opinion, the lack of social demand for the introduction of “smart” technologies can be partly explained by the presence of problems in a large number in the socio-economic development of the Russian territories and deep dissatisfaction with the life quality of the local population. By analogy with the pyramid of needs, Maslow (TorabzadehKhorasani and Almasifard, 2017) suggests that until the minimum basic set of public goods that satisfy people needs is obtained (Elliott and Golub, 2013) and minimum standards of life quality are obtained (Bigby and Beadle-Brown, 2016), people will be more concerned about low incomes and rising prices than about smart urban development.

A necessary condition for the transformation of Russian cities to the concept of “smart city” development is the presence of such constraints as a lack of financial resources, incompetence of the territory stakeholders (digital literacy), and a high level of corruption. Eliminating these factors or minimizing them is a necessary condition for transformation to the "smart” development of Russian cities, which defined the boundaries of improving the quality of public administration in Russia. The contribution of the paper to academic literature consists in the substantiation of the pivotal role of a qualitative factor – the quality of public administration – in the factor system of creation and development of smart cities. This permits reconsidering the concept of smart cities, which, according to the results of this research, are scarcely ever naturally developing, but require (for example, in Russia, and maybe elsewhere around the world) government intervention through public administration, the quality of which determines the efficiency of creation and development of smart cities. The results of this research can be used to analyze problems of the quality of public administration related to the development and implementation of digital technologies.

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