EVALUATION OF THE ACTIVITIES OF PUBLIC AUTHORITIES IN THE SPHERE OF INFRASTRUCTURE DEVELOPMENT AND SMART TECHNOLOGIES

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ABSTRACT

Issues of public authorities' activities determine the state of infrastructure development and integration of smart technologies. The concept of "smart cities" is becoming increasingly popular. It provides an innovative ecosystem for effective interaction between public authorities and citizens, reducing direct administrative costs of local administrations. The present study has used statistical methods in order to analyze surveys of citizens of different regions of Ukraine on the activities of public authorities. The investigation has been based on the concept of a "smart city". The results show that the activities of public authorities in the sphere of infrastructure development and integration of smart technologies remain chaotic. The main reason for this state lies in regional differences in the competence and skills of local authorities. Corruption, mistrust and low level of citizens' involvement in the development of smart cities are the main reasons for the lack of significant changes, barriers to the integration of the "smart city" concept. An additional factor is the passive position of citizens due to psychological factors (distrust of the activity, lack of activity in the life of the city, unwillingness to participate in the discussion of urban issues). The main barriers of infrastructure development are as follows: fiscal constraints, lack of skills and competencies, corruption. Barriers of infrastructure development in the context of citizens' involvement are as follows: lack of ability to monitor the transparency of budget allocation, low level of interest, lack of digital skills, lack of smart technologies to ensure communication between government and citizens through mobile devices, lack of citizens' influence on management decisions. The development of the "state in the smartphone" concept as well as "smart cities" concept is a solution to the identified problems of infrastructure development.

Keywords: Smart City; Smart Technologies; Public Authorities; Citizens' Involvement; Competence of Local Government.

INTRODUCTION

Issues of public authorities' activities determine the state of infrastructure development and integration of smart technologies. The basic problems include the following ones: low energy efficiency of municipalities, dependence on borrowed capital, low level of investment in technology due to mistrust, corruption. In world practice, smart projects are a potential tool for infrastructure development, especially in depressed regions (Komarevtseva, 2017). The concept of "smart cities" is becoming increasingly popular. It provides an innovative ecosystem for effective interaction between public authorities and citizens, reducing direct administrative costs of local administrations (Pérez González & Díaz Díaz, 2015). The experience of EU countries shows that such an ecosystem provides innovative services to communities through the implementation of Human Smart Cities projects in cities (Oliveira & Campolargo, 2015). As a result, a higher level of safety and a higher level of life quality is ensured thanks to intelligent technologies (Davies, 2020); a sustainability, safety and smartness are key components of a developed infrastructure (Haque et al., 2013). Modernization of infrastructure is one of the key objectives of public authorities around the world (Offenhuber & Schechtner, 2018).

In Ukraine, the main problems of public authorities in the sphere of infrastructure development and smart technologies can be considered as follows: budgetary constraints, corruption, bureaucracy, distrust of government. Responsibility for infrastructure development, operation and maintenance is usually assigned to public authorities (Stuart & Ozawa-Meida, 2020). Consequently, the problems outlined slow down the development of smart cities in Ukraine and the implementation of smart specialization approaches to the preparation of regional development strategies (Syusko, 2015). Additional problems in implementing the concept of a "smart city" in Ukraine are as follows: the low level of public involvement in the development of smart projects, the announcement of a wide range of priorities, the lack of logic in setting goals by public authorities (Syusko, 2015). As a result, the announcement of the use of the European model of regional development in 2015 remains a formality. The strategies only document the EU methodology for smart specialization (Syusko, 2015).

In Ukraine, the approach of smart specialization of regions, in particular, to infrastructure development has not become widespread yet. At the same time, the State Strategy for Regional Development for 2021-2027 (Cabinet of Ministers of Ukraine, 2020) envisages improving competitiveness of regions by increasing the level of "digitalization of regions and digital awareness", "the level of infrastructure development to the needs of the economy and population and regions as a whole". Insufficient level of local governments' capacity and institutions of regional development towards ensuring effective implementation of reforms and provision of high quality services to the population determines the relevance of the study (Cabinet of Ministers of Ukraine, 2020).

The purpose of the academic paper lies in assessing the activities of public authorities in the sphere of infrastructure development and smart technologies in order to identify potential tools for improving the efficiency of public administration.

To achieve the objective outlined, the following research hypotheses are formed:

1. The activity of public authorities remains inefficient and is confirmed by the unsatisfactory state of development of settlements' infrastructure (Question 8. What problems worry you most of all today?).

2. The development of local infrastructure (construction of roads, water, gas and sewerage and landscaping) is chaotic due to the low level of activity and competencies of public authorities (Blocks II-III of the questionnaire "II. Activities of the council (executive body) of the united territorial community. III. The state of development of settlements' infrastructure").

3. The level of citizens' involvement in infrastructure development is low due to lack of awareness about decentralization reform and the activities of the united territorial community (Block IV).

4. Improving the efficiency of public administration is possible through the development of relations in the territorial community (Block V).

LITERATURE REVIEW

The scientific literature has been discussing the worldwide recognition of the importance of developing smart technologies for ensuring access to public services (Offenhuber & Schechtner, 2018), integration, planning, infrastructure management (Mboup, 2017; Kozhanova, 2020) in the context of fiscal constraints, social and spatial unevenness. Evaluation of the activities of public authorities in the sphere of infrastructure development and smart technologies is necessary for policy development in this area. In particular, the policy of public authorities should contain the development of incentives for investment in smart technologies (Zhuravleva et al., 2019).

The introduction of smart technologies and infrastructure development depends on the efficiency of municipalities. Herewith, there is a causal link between the development of infrastructure: the development of municipalities depends on the development of social infrastructure, which shapes the life quality of the population (Frolova et al., 2016). Public authorities should develop regional development strategies based on a smart specialization approach. Smart specialization is considered as a local approach for identifying areas of strategy to support regional development based on an analysis of strengths and weaknesses, threats and opportunities to the regional economy. It is carried out, in particular, through the search for entrepreneurial talent in order to involve all interested parties (Syusko, 2015). This approach ensures the integration of technological approaches through mechanisms for monitoring the region's specialization and a broad view of innovation (Syusko, 2015).

The integration of smart technologies is carried out through the implementation of smart projects. The development of smart cities is the consequence of these processes (Smart City) (Komarevtseva, 2017). "A smart city is viewed as a sustainable, inclusive and prosperous city that promotes a people-centric approach based on three core components and seven dimensions" (Mboup, 2017). "The vision of "Smart Cities" is the urban center of the future, made safe, secure environmentally green, and efficient because all structures- whether for power, water, transportation, etc. are designed, constructed, and maintained making use of advanced, integrated materials, sensors, electronics, and networks which are interfaced with computerized systems comprised of databases, tracking, and decision-making algorithms" (Hall et al., 2000).

Smart technologies (intelligent technologies) provide the development of intelligent infrastructure with the following main components: smart ICT, smart institutions and laws, smart city's fund (Figure 1). The main dimensions of Smart City are as follows: environmental sustainability, infrastructure development, social development, social integration (inclusion), peace and security, sustainability and Disasters Exposure (Mboup, 2017).
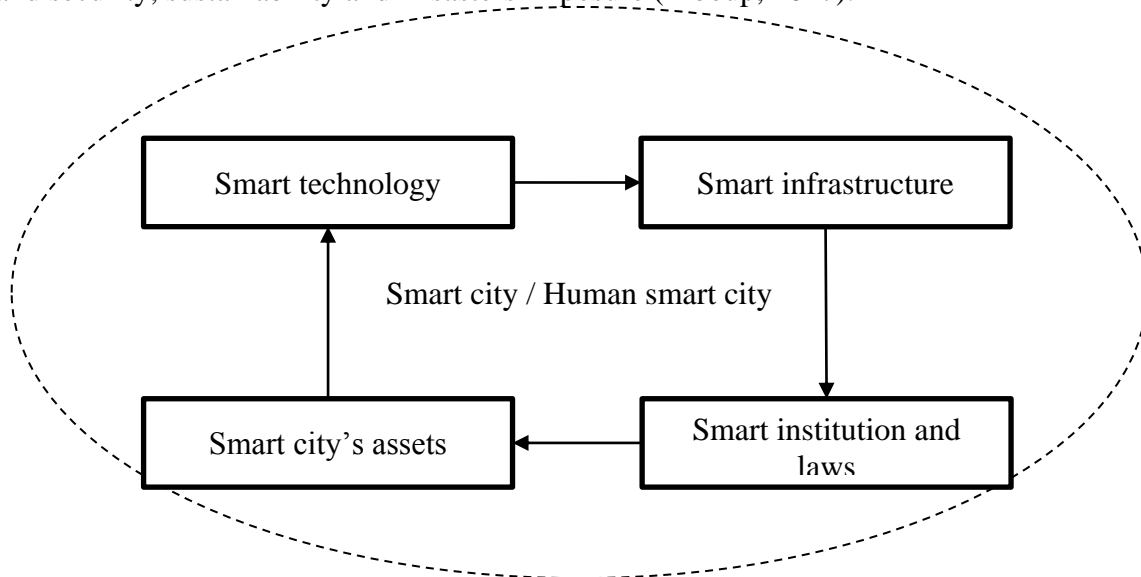

FIGURE 1

THE CONCEPT OF "SMART CITIES"

The basis for the development of smart cities is the digital infrastructure and financial capacity of municipal budgets (Kozhanova, 2020). The development of a smart city's infrastructure involves social, economic and environmental elements that connect citizens with the categories of services, namely: transport infrastructure, educational infrastructure, ICT, health care and housing infrastructure, etc. Smart technologies provide connecting people to different types of infrastructure and related services (Mboup, 2017). In this case, municipalities play a key role as a factor in determining the level of access of the population to infrastructure and increasing the efficiency of infrastructure, development of policies and strategies in the field of smart technologies (Angelidou, 2016; Russkova et al., 2020). For instance, smart technologies are as follows: Bus Rapid Transit (BRT) (Mboup, 2017), blockchain-based digital payment services for public services (Kozhanova, 2020), smart travel planning and payment technologies (Musatova et al., 2016), sensor networks, cartographic drones and big data (Offenhuber & Schechtner, 2018), utility metering technologies based on intelligent meter monitoring system (Al-Hader & Rodzi, 2009; Stuart & Ozawa-Meida, 2020), technologies for ensuring social interaction between public authorities and citizens as consumers of public services. Some studies (Mboup, 2017) prove the active formation of a favorable environment for ICT development at different levels. With this aim in view, it is necessary to form a legal basis to support

mechanisms for regulating the use of technology in infrastructure (Mboup, 2017), to ensure decentralized management of infrastructure development.

The evolution of the "smart cities" concept has led to the emergence of the concept of "Smart government" as an element of e-government and democracy (Gil-Garcia et al., 2014). This concept characterizes the activities of public authorities in terms of creative investment in technology, along with innovative strategies in order to form flexible and sustainable government structures and management infrastructure (Gil-Garcia et al., 2014). Smart government transforms the provision of services to citizens and changes the governance structure, making it more open.

METHODOLOGY

The Concept and Design

The present investigation uses the concept of "smart cities" (Pérez González & Díaz Díaz, 2015), which provides a link between smart technologies, intellectual infrastructure and intellectual institutions of power (Mboup, 2017). This concept envisages the implementation of smart projects by public authorities in order to improve the quality of public services (Fetisova et al., 2020). It provides development and implementation of smart city policy by public authorities. This concept concerns the social and legal aspects of smart cities, related to the issue of confidentiality of citizens' data in connection with the development of digital public services, spatial and material consequences of the transition to smart cities (Edelenbos et al., 2018). The design of the study is of quantitative nature. It provides a survey of citizens of Ukraine to assess the activities of public authorities in the field of infrastructure development and smart technologies. As a result, the level of integration of the "smart cities" concept in the activities of municipalities has been determined.

Data and Sampling

Spatial data characterizing the social-demographic features of the Ukrainian citizens and their opinion on the effectiveness of public authorities in the field of the research have been used in order to quantify the activities of public authorities in the field of infrastructure development and smart technologies. Data have been collected in September-November 2020 due to the dissemination of an online form of the questionnaire developed by Google Forms. The questionnaire contained the following blocks of questions: I. Social-demographic features of respondents. II. Activities of the council (executive body) of the united territorial community. III. The state of development of settlements' infrastructure. IV. Awareness of decentralization reform and the activities of the united territorial community. V. Improving the efficiency of public administration through the development of relationships in the local community.

The survey involved 75 citizens of Ukraine aged 18 and older, including 69.3% women and 30.7% men; the basic age category: 29-37 years old (37.3%) and 38-45 years old (41.3%). The sampling was dominated by respondents with higher education – 93.3%, residents of Kharkiv and Kyiv regions (66.7% and 28.0% respectively), residents of large cities (over 1 million inhabitants) (Table 1).

Methods of Processing the Results of the Questionnaire

Statistical methods have been used for data processing in order to assess the reliability of survey results, which includes assessing the stability, bias and effectiveness of estimates. For this purpose, the statistical methods presented in Table 2 have been used. IBM SPSS Statistics 22.0 software has been used for data processing.

TABLE 1
SOCIAL-DEMOGRAPHIC FEATURES OF RESPONDENTS

	Number, persons	**Percentage, %**	**Cumulative percentage**
Gender			
Female	52	69.3	69.3
Male	23	30.7	100.0
Total	75	100.0	
Age			
18-28 years old	7	9.3	9.3
29-37 years old	28	37.3	46.7
38-45 years old	31	41.3	88.0
46-55 years old	6	8.0	96.0
56 years old and older	3	4.0	100.0
Total	75	100.0	
Education			
Higher	70	93.3	93.3
I have a degree	4	5.3	98.7
University not completed	1	1.3	100.0
Total	75	100.0	

TABLE 2
STATISTICAL METHODS FOR VERIFYING THE RELIABILITY OF SURVEY RESULTS

Method	**Calculation formula**	**Value and use**
Descriptive statistical methods		
The average value of the series	$\bar{x} = \dfrac{1}{N} \sum\limits_{i=1}^{N} x_i$	To compare values between variables
Dispersion	$s_x^2 = \dfrac{\sum\limits_{i=1}^{N}(x_i - \bar{x})^2}{N-1}$	To assess the deviation from the average value. Deviation of a random variable from the average value
Standard deviation	$\sigma = \sqrt{s_x^2}$	To assess the deviation from the average value.
Coefficient of variation	$V = \dfrac{s_x^2}{\bar{x}}$	To assess the level of homogeneity of data, not more than 33%

Correlation	$\rho = \dfrac{s_{xy}}{\sigma_x \sigma_y}$	To determine the direction of link between variables (forward, reverse), 0 - 1

RESULTS

Development and unsatisfactory condition of infrastructure (road construction, water and gas supply, sewerage and provision of urban amenities) is one of the problems recognized by citizens in Ukraine in the context of inefficiency and distrust to public authorities. In particular, this issue is noted as a consequence of the low level of human legal protection, corruption of the authorities, low level of technical support. Respondents have noted concerns about the formation of united territorial communities (37,3% answered "yes", 34,7% answered "rather yes", 28,0% answered "hesitate to answer", "no", "rather no"). This means a high level of indifference of citizens to decentralization, lack of interest and participation in the functioning of public authorities. As a result, the level of public influence on decision-making is reduced. Therefore, it is possible to refute the hypothesis of a low level of citizens' involvement in infrastructure development due to lack of awareness of decentralization reform and the activities of the united territorial community. Citizens' involvement may also be low due to reluctance to participate in local development.

TABLE 3
DISTRIBUTION OF RESPONDENTS' ANSWERS TO THE QUESTION "DO YOU THINK THAT THE NEW POWERS / SERVICES OF THE UNITED TERRITORIAL COMMUNITY REQUIRE ADDITIONAL QUALIFICATIONS FROM THE EMPLOYEES OF THE EXECUTIVE BODY?"

	CAS (Center of Administrative Services) activities		Maintenance of streets and roads		Infrastructure development	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
It is difficult to answer	14	18.7	10	13.3	12	16.0
No, the qualifications of existing employees are sufficient	18	24.0	7	9.3	3	4.0
Yes, they certainly require additional organizational skills	15	20.0	15	20.0	19	25.3
Yes, they certainly require additional management skills	14	18.7	25	33.3	24	32.0
Yes, they certainly require additional qualifications (special knowledge)	14	18.7	18	24.0	17	22.7
Total	75	100.0	75	100.0	75	100.0

Citizens note that the decentralization reform has provided additional implementation /provision of infrastructure development services, including local ones. However, these

processes take place with differences and levels of intensity in the regions. This means that the hypothesis of chaotic development of local infrastructure is confirmed. However, the social sphere remains a priority one in the activities of public authorities. It stands to mention the improvement of the organization of administrative service centers through automated processes. Therefore, it is possible to confirm the hypothesis that the activities of public authorities remain inefficient. They are confirmed by the unsatisfactory state of infrastructure development of settlements due to the priority of the social sphere.

The new powers/services of the united territorial community require public authorities to acquire additional qualifications (Table 3). This means that citizens assess the level of skills and competencies of public administration bodies at a low level. By the way, they note the high level of need for organizational, managerial and specialized skills and knowledge. It should also be noted that there are regional differences in assessing the level of need for additional skills. Therefore, the hypothesis of chaotic infrastructure development due to the low level of activity and competencies of public authorities is confirmed.

Citizens feel the greatest need for management skills in ensuring the maintenance of roads/streets (33.3% of respondents) and infrastructure development (32.0% of respondents).

Citizens assess the development of local infrastructure as the one, requiring additional competencies/skills/abilities due to the average level of complexity (average value is 3,253) (Table 4). At the same time, estimates vary significantly within regions (standard deviation from the average is 1,1751). The most difficult issues in terms of management skills noted by citizens are as follows: the powers / services in the sphere of development of health care facilities (average 3,773 with a deviation of 1,2474), maintenance of streets and roads (average 3,360 with a deviation of 1,2589), organization of passenger transportation, management of housing maintenance and utilities (housing and communal services), management of land resources, fire protection, public safety and educational institutions.

TABLE 4
ASSESSMENTS OF RESPONDENTS' ANSWERS TO THE QUESTION "FROM THE POINT OF VIEW OF MANAGERIAL SKILLS, WHICH POWERS/SERVICES DO YOU THINK ARE THE MOST DIFFICULT ONES (AND REQUIRE ADDITIONAL COMPETENCIES/SKILLS/ABILITIES) IN ORDER TO BE IMPLEMENTED WITHIN THE UNITED TERRITORIAL COMMUNITY?"

	Average value	Standard deviation	Dispersion
Public security	3,307	1,3149	1,729
Educational institutions	3,240	1,2611	1,590
Education and training of children in boarding schools	3,280	1,2364	1,529
Institutions of physical culture and sports	2,787	1,2225	1,494
Cultural and educational institutions	2,787	1,2114	1,467
Center of Administrative Services (CAS)	2,880	1,3652	1,864
Social protection and social security	3,160	1,2949	1,677
Healthcare facilities	3,773	1,2474	1,556
Maintenance of streets and roads	3,360	1,2589	1,585
Local infrastructure	3,253	1,1751	1,381
Organization of passenger transportation	3,240	1,2503	1,563
Management of housing maintenance and utilities	3,267	1,2556	1,577

(housing and communal services)			
Land resources management	3,253	1,2955	1,678
Fire protection	3,413	1,2744	1,624

* it has been assessed using a scale where 1 = not difficult, 5 = very difficult

Thus, the survey proves the existence of significant problems in the activities of public authorities due to the lack of management skills in various areas of infrastructure development: education and health, public safety, housing, etc.

The respondents assess the level of funding of powers exercised by the authorities in the settlement as "rather insufficient" (28%) or "yes, insufficient" (21.3%). The answer "difficult to answer" was given by 28% of respondents, "sufficient" - 4%, "rather sufficient" – 18.7%. This means an awareness of the lack of funding and remuneration of public authorities to achieve goals in infrastructure development.

Distribution of respondents' answers to the question "42; How has the number of financial resources changed during the last financial year in your locality?" was as follows: remained unchanged (16%), increased (20%), decreased due to joining the united territorial community of less financially secure settlements (villages) (6.7%), I do not know / it is difficult to answer (57.3%). This means that the community does not have information on financing the development of infrastructure and the community as a whole; therefore, there is a low level of financial transparency in the activities of public authorities. This reduces the level of trust in the government as a whole. At the same time, we note the subjectivity of such assessments among citizens.

Distribution of respondents' answers to the question "43; Are you personally ready to take part in measures to improve the provision of urban amenities of your locality (plant trees, take part in cleaning parks, river banks, protests against tree felling, etc.)?" was as follows: it is difficult to answer (12%), I have experience and I am willing to participate (34.7%), I have experience but I am not ready to participate (8.0%), I have no experience and I am willing to participate (40.0%), I have no experience and I am not ready to participate (5.3%). This means a high level of potential community involvement in infrastructure development.

Most citizens take a passive position concerning infrastructure development, despite the potential willingness to participate in measures to improve the provision of urban amenities. Therefore, the percentage of citizens who consider it is the duty of local authorities to take actions is as follows: 1) 53.3% believe that local authorities should involve international organizations in the reconstruction of local infrastructure; 2) 77.3% believe that local authorities should allocate funds from the local budget for the reconstruction (construction) of schools, hospitals, roads, other (specify which) facilities; 3) 73.3% believe that local authorities should promote the establishment of parks; 4) 70.7% believe that local authorities should plant flower beds and conduct other activities.

Distribution of respondents' answers to the question "69; Are you ready to bear certain financial costs to improve the infrastructure in your locality?" was as follows: it is difficult to answer – 13.3%, no – 32.0%, yes, but not significant – 53.3%, yes, and even quite significant - 1.3%. This confirms the passive position of the population in promoting infrastructure development.

Awareness of decentralization reform and the activities of the united territorial community are characterized by the following features:

1) Public authorities mostly use such information tools as meetings with employees of the executive body, meetings with the head of the local community, announcements/information in the local newspaper, explanatory programs/announcements on local television, announcements/information on the website of the local community, social networks (more than 10.7%).

2) The main sources of information about events in the settlement are as follows: Internet (more than 90%), public transport, newspapers, friends, family, and place of study or work, magazines, television and radio;

3) 33.3% of respondents are partially provided with an information portal (site) for online monitoring of the work of utilities, town (village) council, 24% are partially provided, 36% are not provided, 6,7% are hesitant to answer;

4) 54.7% of respondents cannot influence the course of work in settlements, 17.3% are hesitant to answer, 5.3% can influence, 22.7% partially influence;

5) Respondents note the lack of the following types of information on the development of the settlement, namely: of legal nature, on the activities of authorities at other levels; social-political; financial and economic;

6) 41.3% understand the phrase "smart-city" as "integrated innovative management of the city's life with the use of information and communication technologies", 13.3% - as "the use of information and information and communication technologies within functioning of separate systems of municipal economy", 45.3% - as "strategic management, the purpose of which is to create conditions for the development of human potential and ensure sustainable development through the introduction of information and communication technologies and other innovative technologies".

In fact, the passive social behavior of citizens determines the level of their participation in urban development and infrastructure. With high expectations of the government's actions on infrastructure development and a low level of involvement in urban development, the implementation of the "smart city" concept may be constrained. Taking into consideration the importance of the Internet in informing citizens about urban development, public authorities should pay more attention to the development of sites and pages on social networks, where citizens can participate in the discussion of social problems and community needs.

TABLE 5
DISTRIBUTION OF ANSWERS TO THE QUESTION: "HOW DO YOU ASSESS THE DEGREE OF "PROBLEMATIC" TYPES OF URBAN PUBLIC INFRASTRUCTURE", WHERE 1 = NO PROBLEMS, 5 = VERY PROBLEMATIC? *

	Average value	Standard deviation	Dispersion
The provision of urban amenities	3,573	1,1171	1,248
Transport complex	3,293	1,0877	1,183
Management, communication, information and other organizations	3,013	0,9226	0,851
Social infrastructure	3,187	1,0487	1,100

Consumer market complex (trade, public catering, consumer services)	2,827	1,2122	1,470
Ensuring public safety in the territory of the municipality	3,347	1,1797	1,392

All types of urban public infrastructure are assessed as problematic (Table 5). Respondents consider the following types as the most problematic ones, namely: the provision of urban amenities (3,573), ensuring public safety in the territory of the municipality (3,347), transport (3,293), social infrastructure (3,187) and management systems, communications, information and other organizations (3,013).

In general, respondents highly appreciate the potential for the introduction of smart technologies in the short term to infrastructure sectors (Table 6).

TABLE 6
ASSESSMENT OF THE POTENTIAL OF INTELLIGENT TECHNOLOGIES' IMPLEMENTATION IN THE SHORT TERM IN THE INFRASTRUCTURE SECTORS

	High	Very high	Low	Moderate
Power supply	29,3	16,0	17,3	37,3
Heat supply	28,0	17,3	21,3	33,3
Water supply	26,7	14,7	24,0	34,7
Transport	28,0	12,0	14,7	45,3
Housing and civil construction	28,0	12,0	32,0	28,0
Consumer market complex (trade, public catering, consumer services)	32,0	9,3	17,3	41,3
Ensuring public safety	20,0	13,3	18,7	48,0
Ecological safety	20,0	10,7	32,0	37,3
Management, communication, information and other organizations that serve urban needs	41,3	9,3	12,0	37,3
Social infrastructure (education, health, culture, sports, social services)	28,0	12,0	17,3	42,7
Municipal governance	33,3	10,7	18,7	37,3

Respondents believe that the greatest potential for the introduction of smart technologies is in the systems of management, communication, information, and other organizations that serve urban needs (41.3%), consumer market complexes (trade, catering, consumer services) (32%) and municipal administration (933.3%). Along with this, 58.9% of respondents on average rated the potential of smart technologies as moderately low in all areas of infrastructure. This means distrust in the capabilities and actions of public authorities. For instance, only 8.0% of respondents trust local authorities, 30.75% hesitate to answer, 14.7% do not trust, 26.7% rather trust and 20.0% rather do not trust. 58.7% of respondents do not have the opportunity to monitor the transparency of budget allocations, 24% partially monitor, 5.3% have such an opportunity. This can mean both a low level of interest and a lack of digital skills. At the same time, 49.3% claim about the convenience of using mobile devices to make suggestions on the state and development of the city's infrastructure; 25.3% note the partial convenience; 41.3% of

respondents do not have the opportunity to influence the development and management of the settlement; 26.7% are hesitant to answer; 29.3% may partially influence. Numerous citizens note the desire to make proposals for development via e-mail, online via phone or PC, the Internet and the city's website, etc.

DISCUSSION

The investigation of the activities of public authorities in the field of infrastructure development shows numerous problems in its various branches. These problems are caused by both the low level of skills and competencies of public authorities and the low level of community involvement concerning changes in the context of decentralization. The position of the population remains passive, along with high demands and expectations regarding potential actions of local authorities. The identified features of local government activities are as follows: corruption of the government, low level of technical support, problems in the formation of united territorial communities, lack of interest of citizens and their participation in the functioning of public authorities, reducing public influence on decisions, in particular, due to low level participation of the citizens by themselves.

The study proves that the decentralization reform has provided additional opportunities in the implementation/provision of services in the field of infrastructure development, in particular local. However, these processes occur with various differences and levels of intensity in the regions. The new powers/services of the united territorial community require public authorities to acquire additional qualifications, which are underestimated by citizens. They note the high level of need for organizational, managerial and specialized skills and knowledge. The level of funding for the powers exercised by the authorities in the settlement is insufficient for the efficient activities of public authorities. Herewith, the paradox lies in the fact that the community does not have information on financing the development of infrastructure and the community. Therefore, there is actually a low level of financial transparency in the activities of public authorities. The passive position of citizens on infrastructure development is also an important issue, despite their potential willingness to participate in measures to improve the provision of urban amenities.

The potential for the development of local infrastructure and smart cities is the wide dissemination of information on the opportunities offered by decentralization. Citizens increasingly prefer online forms and methods of communication, participation in the activities of municipalities. Consequently, smart technologies can become a tool for the development of interaction between government and the population. Therefore, the expediency of introduction of communication-integrated system "Smart-city", potential of introduction of smart technologies in systems of management, communication, information, and other organizations serving city needs, complex consumer markets (trade, public catering, consumer services) has been revealed. This means the digital readiness of citizens to use smart technologies to develop local infrastructure. Therefore, by improving the digital information mechanism and involving the community, city life may have a greater impact on infrastructure development, especially in the most depressed areas.

CONCLUSION

The activities of public authorities in the field of infrastructure development and integration of smart technologies remain chaotic due to regional differences and different levels of competence and skills of local authorities. Corruption, mistrust, and low level of involvement of citizens in the development of smart cities are the main reasons for the lack of significant changes, barriers to the integration of the "smart city" concept. The passive position of citizens is caused more likely by psychological factors (distrust of activities, lack of activity in city life, unwillingness to participate in the discussion of urban problems). Despite the high assessment of the potential of Internet tools as a way to involve citizens in infrastructure development, it is impossible to predict how actively the population will participate in the development of smart cities. This is due to the current passive behavior of the population and the high level of expectations of citizens to take measures by local authorities to develop infrastructure. It also means distrust in the capabilities and activities of public authorities (the level of trust in local authorities is only 8.0%). The basic barriers to the development of infrastructure for public authorities are as follows: fiscal constraints, lack of skills and competencies, corruption. At the same time, citizens who are also responsible for the development of smart cities do not understand the potential of smart technologies in infrastructure development. Barriers of infrastructure development in the context of citizens' involvement are as follows: lack of ability to monitor budget allocation, low level of interest, lack of digital skills, lack of smart technologies to ensure communication between government and citizens via mobile devices, lack of influence on management decisions. The development of the "state in the smartphone" and "smart cities" concepts is a solution to the identified problems of infrastructure development.

REFERENCES

Al-Hader, M., & Rodzi, A. (2009). The smart city infrastructure development & monitoring. *Theoretical and Empirical Research in Urban Management, 2*(11), 87-94.

Angelidou, M. (2016). Four European smart city strategies. *International Journal of Social Science Studies, 4*(4), 18-30.

Davies, A. (2020). IOT, smart technologies, smart policing: the impact for rural communities. In *Smart Village Technology,* 25-37.

Edelenbos, J., Hirzalla, F., van Zoonen, L., van Dalen, J., Bouma, G., Slob, A., & Woestenburg, A. (2018). Governing the complexity of smart data cities: Setting a research agenda. In M.P. Rodriguez Bolivar (eds.), *Smart Technologies for Smart Governments* (pp. 35-54). Cham (Switzerland): Springer.

Fetisova, O. V., Kurchenkov, V. V., Golodova, O. A., & Azmina, J. M. (2020). The role of information (smart) technologies in improving the efficiency of public administration. *Proceedings of Institute of Scientific Communications Conference,* 965-975.

Frolova, E. V., Vinichenko, M. V., Kirillov, A. V., Rogach, O. V., & Kabanova, E. E. (2016). Development of social infrastructure in the management practices of local authorities: trends and factors. *International Journal of Environmental and Science Education, 11*(15), 7421-7430.

Gil-Garcia, J. R., Helbig, N., & Ojo, A. (2014). Being smart: Emerging technologies and innovation in the public sector. *Government Information Quarterly, 31*, I1-I8.

Hall, R. E., Bowerman, B., Braverman, J., Taylor, J., Todosow, H., & Von Wimmersperg, U. (2000). *The vision of a smart city*. Brookhaven National Lab., Upton, NY (US).

Haque, M. M., Chin, H. C., & Debnath, A. K. (2013). Sustainable, safe, smart-three key elements of Singapore's evolving transport policies. *Transport Policy, 27*, 20-31.

Komarevtseva, O. O. (2017). Smart city technologies: new barriers to investment or a method for solving the economic problems of municipalities?. *R-Economy, 3*(1), 32-39.

Kozhanova, A. V. (2020). Financing of development of the digital infrastructure of *"Smart" cities. Proceedings of 13th International Scientific and Practical Conference- Artificial Intelligence Anthropogenic nature Vs. Social Origin,* 111-122.

Mboup, G. (2017). Smart infrastructure development makes smart cities-Promoting smart transport and ICT in dakar. In Vinod Kumar T. (eds), *Smart Economy in Smart Cities. Advances in 21st Century Human Settlements* (pp. 871-904). Springer, Singapore.

Musatova, Z., Mkhitaryan, S., Nevostruev, P., Sidorchuk, R., & Komleva, N. (2016). Smart-technologies in public transport and their perception by the youth audience. *Indian Journal of Science and Technology, 9*(42), 10-17485.

Offenhuber, D., & Schechtner, K. (2018). Improstructure-an improvisational perspective on smart infrastructure governance. *Cities*, 72, 329-338.

Oliveira, Á., & Campolargo, M. (2015, January). From smart cities to human smart cities. *Proceedings of 48th Hawaii International Conference on System Sciences,* 2336-2344.

Pérez González, D., & Díaz Díaz, R. (2015). Public services provided with ICT in the smart city environment: the case of spanish cities. *Journal of universal Computer Science, 21*(2), 248-267.

Russkova, E. G., Ponomareva, L. V., & Yakhtin, V. A. (2020). Public poicy of the russian federation in the sphere of smart technologies development. *Proceedings of Institute of Scientific Communications Conference,* 955-964.

Stuart, G., & Ozawa-Meida, L. (2020). Supporting decentralised energy management through smart monitoring systems in public authorities. *Energies, 13*(20), 5398.

Syusko, M. (2015). Application of approaches "SMART SPECIALIZATIONS" to prepare a regional strategy development. *U-LEAD with Europe*.

Zhuravleva, N. A., Nica, E., Durana, P. (2019). Sustainable smart cities: Networked digital technologies, cognitive big data analytics, and information technology-driven economy. *Geopolitics, History, and International Relations, 11*(2), 41-47.