

# Application of Innovative Technologies in Sustainable Municipal Development

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**Abstract:** The article is devoted to the actual topic of the application of innovative technologies in municipal management. The use of innovative technologies contributes to both the development of the economy of the territory and the level of comfort of the living population. This indicates the relevance of this topic. The purpose of the article is to study the possibility of applying innovations in the activities of the municipal formation. It substantiates the need for the development of innovations, the main directions of innovative development, and offers a model for the development of innovative processes in the municipality. In the course of the research, the author comes to the conclusion not only about the possibility, but also the need to innovate municipal management. This article can be used both to determine the direction of using innovative technologies, and to assess the possibility of their use on their territory. The materials of the article may be of certain interest not only for the Russian Federation, but also for other countries, which is due to the worldwide spread of innovative technologies.


## 1 INTRODUCTION


In a democratic state, the organization and exercise of power is based on the principle of separation of powers associated with the principle of local self-government. This principle guarantees the decentralization of the management system in the Russian Federation, which makes this system more suitable for ensuring the interests of the population, taking into account historical and other local traditions. Today, most of the municipalities of the Russian Federation have a tendency to reduce the rates of social and economic development, which is associated with the use of outdated technologies and equipment in housing and communal services and industry. In this regard, municipal authorities cannot ensure a high level of quality of life of the population, as a result of which municipalities are losing their competitive advantages.


The development of municipalities in Russia has recently been associated with the development of innovation, the use of digital technologies. Innovatization involves the search and implementation of the latest achievements of scientific and technological progress in the activities of organizations operating in a certain territory, and in the work of local self-government bodies.


## 2 METHODS

The research methodology is based on the use of a number of methods in assessing certain aspects of the problem under consideration. So, to study the theoretical foundations of the innovation of municipal management, such general scientific methods as formalization, theoretical generalization, analysis and synthesis, scientific abstraction were used. Research into the prospects of innovative development of

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municipalities was carried out using economic and statistical methods. Modeling was used in the formation of the concept of the innovation system of the municipality.

A number of works by such scientists as Bezpалov, V.V. ; are devoted to the study of the processes of innovation in municipal management; Fedyunin, D.V. ; Solopova, N.A. ; Avtonomova, S. A. ; Lochan, S.A. A, Meira L, Irit H, Itzhak A., Piera C, Roberto C, Emilio E. (Bezpалov, Fedyunin, Solopova, Avtonomova and Lochan, 2019; Meira Irit and Itzhak 2018; Pier, Roberto and Emilio; 2017).

### 3 FINDINGS

In the Russian Federation, innovative technologies began to be applied precisely in business entities. The dynamics of the development of innovative processes in the sectors of the economy is shown in Figure 1.

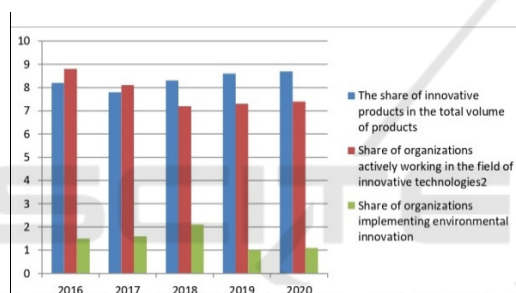


Figure 1: Dynamics of the development of innovative processes in the economy.

It can be noted that the share of innovative products in the total volume of manufactured products increased from 8.2% in 2016 to 8.7% in 2020. However, there has been a decline in the proportion of businesses that innovate in technology and environmental innovation.

The introduction of digital technologies leads to significant cost savings and increased production efficiency. According to the data provided by the McKinsey consulting agency, industries using digital technologies reduce their operating costs by an average of 3.6% and increase efficiency by 4.1% (Gulbin, 2018).

According to the annual research - Digital IQ, conducted by the consulting agency PwC, the profit from investment in innovation, according to the heads of foreign companies, can contribute to revenue growth of up to 50% (Figure 2).

It is possible to note the significant benefits that can be obtained from the introduction of innovations, which predetermines the need for their application not

only in commercial organizations, but also in state and municipal administration. This is especially important in the presence of a budget deficit, since saving budget funds and their more efficient use contributes not only to effective management, but also to an increase in the quality of life of the population (Klimkov, 2018).

One of the main goals of the process of innovatization of municipalities is the formation of objective prerequisites based on the creation of a progressive, in line with modern achievements of world science and technology, innovative infrastructure on the territory of municipalities.

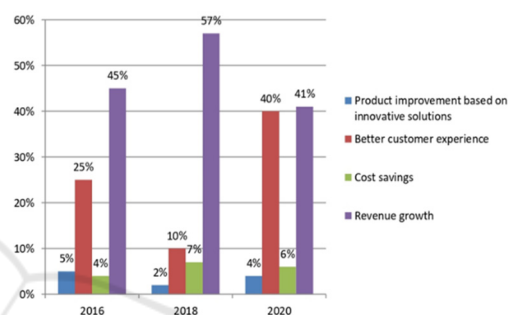


Figure 2: Benefits of innovation to the economy.

At the same time, the last decades in the territory of the country's municipalities were characterized by a decrease in the level of technological effectiveness of the social and industrial infrastructure, a deepening technological backwardness of the main innovation-forming elements of the economic system of municipalities (Gribovskiy, 2018).

Municipal innovation systems are an essential element of regional, sectoral, national innovation systems. Their task is to ensure sustainable effective dynamic economic development of municipalities in order to improve the quality and standard of living of the population (Zhurkevich, 2018).

The most promising and widespread areas of innovatization of the socio-economic development of municipalities are innovations shown in Figure 3.

Innovations in the management of municipalities pursue the goal of ensuring a high level and quality of life of the population and, first of all, on the basis of providing the population with high-quality municipal services.

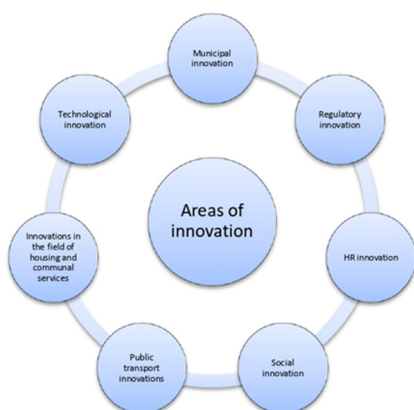


Figure 3: Directions for the development of innovations in municipal management.

A key innovation in this context is the introduction of technologies called e-government. The main components of this innovation should include, first of all:

- a site that allows for high-quality public control of the provision of various types of electronic services to the population in the system of municipal and state administration;
- distribution of SMS-notifications about the receipt of various kinds of funds, transfers, parcels;
- implementation of the principles of one window;
- the introduction of the Internet of Things is one of the most pressing problems of innovation in the socio-economic development of the municipality.

Internet technologies today make it possible to provide the capabilities and needs of municipalities in solving such problems as registering the population for an appointment with a doctor, organizing participation in public projects, the possibility of using proactive budgeting mechanisms, paying utility bills and calling utility employees using applications for smartphones, etc.

Regulatory and legal innovations, first of all, represent the prompt delivery of feedback in the process of improving regulatory and legal acts, changing laws and various kinds of regulations, instructions, rules, etc (Savina, Stepanov and Sepanov, 2018)

Personnel innovations involve the use of new technologies for the selection, assessment, selection of effective workers for the management system of municipal services, etc. These innovations primarily include:

- formation of a system of training highly qualified personnel for the implementation of projects of innovative development of municipalities;
- projects to improve the organizational structure of the management of municipalities;
- ensuring the system of material and technical supply of housing and communal services and the municipal formation;
- creation of an information and digital environment in order to increase the efficiency of the implementation of the innovative potential of the municipality;
- a system of measures to strengthen the reputation, increase the authority and strengthen the image of the self-government system and municipal administration.

Social innovations are aimed at creating favorable working and recreation conditions for the population.

Technological innovation involves the innovative development of education, healthcare, trade, etc.

Innovations in municipal transport technologies are aimed at comprehensive mechanization and automation of all processes that meet the needs for transport services of the population, enterprises, organizations and institutions. Among such innovations are the use of information boards at transport and stops, the use of GPS transmitters for monitoring the movement of municipal transport, the use of electronic payment devices for passenger trips, the use of LED equipment for interior lighting, the wider use of electric and ecological transport, the development of mobile applications for obtaining information about the time and expectation of the arrival of municipal vehicles (Zainetdinov, 2018)

Innovations in the field of housing and communal services are based on the use of the concept of a "smart city".

The main directions of these innovations are:

- electric power industry: cost reduction, increase, energy efficiency;
- intelligent processes of generation and transmission of electrical and other energy;
- reduction of losses of energy transmission from the generator to the consumer;
- smart electricity meters;
- intelligent technologies of street economy (energy-saving lamps, motion sensors, etc.) (Dudin and Stepanov, 2019).

The development of the project of the municipal innovation system should be carried out in stages:

- the first stage is the analysis of the innovation activity of the municipality and the assessment of the innovation potential of the municipality;
- the second stage - substantiation of concepts, forecasts, as well as priority directions of innovative development of the municipality;
- the third stage is the development of an innovative project to create a municipal innovation system;
- the fourth stage - discussion of the developed project for the creation of a municipal innovation system at the scientific and technical council with the participation in the discussion of representatives of government agencies, the scientific community, representatives of the population;
- the fifth stage - preparation of the necessary design and program documents for the creation, organization and operation of innovative municipal systems;
- the sixth stage - substantiation of resource provision for the implementation of projects and programs of innovative development of municipalities;
- the seventh stage is the clarification of the calendar schedules of the work of organizations, enterprises, institutions about those participating in the creation of the municipal innovation system with the assignment of responsible executors and the indication of the timing of the work.

The organization of the effective activity of the innovation system of municipalities requires the identification of priority directions and a system of measures to increase the activation and efficiency of innovation. The main ones are:

- substantiation of models of innovation activity, the main goal of which is to ensure and implement the municipal innovation potential in order to improve the level and quality of life;
- creation of innovation centers in municipalities, various innovation platforms, and other forms of organizing innovation activities that are capable of ensuring high-quality and efficient management in the municipality;
- organization of scientific and consulting organizations and centers, centers for advanced training on the basis of existing advanced innovative enterprises and educational institutions, etc.

The concept of the formation of the innovation system of the municipality is shown in Figure 4.

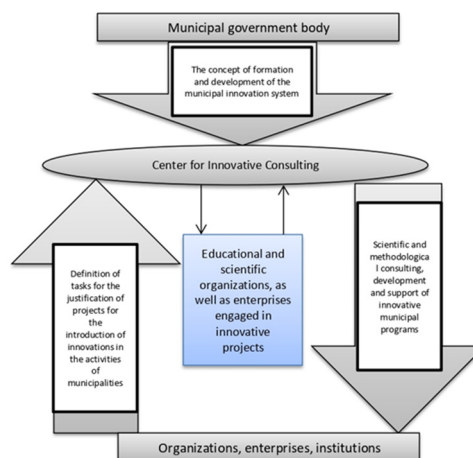


Figure 4: Principal model of the municipal innovation system.

In accordance with the proposed model, it is proposed to create, together with the administration of the city municipal district, higher educational institutions, an Innovation Consulting Center, whose main task is to develop and implement municipal innovation policy based on advanced world trends in the field of scientific and technological progress and coordination of innovation activities.

The purpose of the Center is to develop conceptual approaches and key areas of innovation policy in the municipal formation, to develop scientifically based measures to improve efficiency and activate the concept of innovation in municipalities. The role of the Center is to a certain extent reduced to the role of the project office, where the proposals are assessed, the project is checked for changes to the development strategy of the municipality, and the project's feasibility is checked. Also, the Center is a discussion platform for discussing the proposed changes.

#### 4 DISCUSSION

The advantage of the developed model will be that the municipal innovation system is organized with the involvement of scientists and specialists from the local administration. The main role of this Center will be to coordinate and organize innovation processes on the territory of municipalities. One of the main tasks of this Center will be the promotion of innovations to the market and their implementation in the activities

of institutions, organizations, enterprises of municipalities.

However, it should be noted that this model has a significant drawback, which is due to the weak interest and insufficient activity of local communities in the Russian Federation in the implementation of local self-government. In this regard, a formal approach is possible in the work of the center for innovative consulting and weak ties with the population of the municipality.

## 5 CONCLUSION

The results of the study are to obtain the following scientific results:

- Economic and statistical analysis made it possible to substantiate the effectiveness of innovative development and the need for its use in the municipal sphere of management.
- On the basis of general scientific methods, the most promising and widespread areas of innovatization of the socio-economic development of municipalities have been identified: regulatory, personnel, social, technological, in the field of municipal transport, in housing and communal services and in the field of municipal management.
- Analysis of the practices of implementing innovative development in business, the modern methodology of project management allowed the authors to build a fundamental model of the municipal innovation system. The implementation of this model will significantly increase the share of internal costs for research and development, improve the level and quality of municipal governance, and the comfort of living in a certain area.

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