Concept of innovation center in Voronezh region, taking into account principles of "Smart region"

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Abstract. The article substantiates the need for the creation and development of an innovation cluster in the Voronezh region. The results of the analysis of the implementation of the "smart city" technologies in various regions of Russia are presented. The main directions in creating an innovation center in the region are highlighted. Considered the necessary measures for inclusion in the project on the digitization of urban sectors for the new territory. The work provides for the division of the projected area into several functional areas: residential area, social infrastructure, recreation area, technopolis, cultural policy and business area with relevant needs for innovative and high-tech infrastructure. The work provides for integrated planning of development and use of the territory in accordance with the concept of "smart city". The expected effects and results from the development of the innovation cluster in the region are given.

1. Introduction

Adopted in 2017, the program "Digital Economy of the Russian Federation" [1] involves improving the efficiency and competitiveness of the economy, public administration, social sphere. Voronezh region belongs to the technologically developed regions. Like other constituent entities of the Russian Federation, the region is interested in increasing the speed, quality and coverage of service provision, in increasing the rate of change in service delivery processes, and in reducing government spending. The point of growth of the regional economy of the Voronezh region can be the creation and development of an innovation cluster in the region.

There are currently several modern educational innovation centers and technopolises in Russia, such as Skolkovo in Moscow, Innopolis in Kazan, Yuzhny in St. Petersburg, Technopolis GS in the Kaliningrad region, etc.

Voronezh is a developing large million-plus city, the capital of the Central Black Soil Region. The city has 15 educational organizations of higher education (with a total number of students of about 87 thousand), however, to date, a modern innovation center has not been established. The success of projects in other regions to create an innovation cluster suggests that investment in the construction of high-tech industries in cities can be not only profitable for business, but also give a powerful impetus to the development of the territory [2].
Relevance, scientific significance of the issue

The choice of the optimal scenario of digital transformation of the Voronezh region largely depends on the goals that the region sets for itself, the technological base and the digitalization level of the urban economy. One of the important application areas for the development of digital territories in the Voronezh region today is the development of the concept of a “smart region” [3].

In Russia, such principles are being implemented only in a few small projects of new cities that are at the stage of construction or design, but there is a clear trend towards the development of this direction. “Smart” technologies are partially introduced in many Russian cities (table 1) [4,5].

| City                  | Smart Technologies                                                                 |
|-----------------------|-------------------------------------------------------------------------------------|
| Magas                 | "Smart" energy                                                                      |
| Sochi                 | Information-analytical system "Safe City"                                           |
| Tatarstan             | "Innopolis" - a project to create a new city for young professionals                 |
| Tomilin               | Cluster "National Helicopter Center"                                                |
| Novosibirsk           | Cluster of micro radio electronics                                                  |
| Yaroslavl             | Region Innovative Territorial Cluster "Gas-turbine and power engineering"          |
| Nizhny Tagil          | Project "Bright City"                                                               |
|                      | Centralized lighting control system                                                 |
|                      | Health care                                                                         |
|                      | Education                                                                           |
|                      | Sensors on passenger transport                                                       |
|                      | Sensors on transport utilities                                                      |
| Moscow                | Housing and communal services                                                       |
|                      | Mosrobot: intellectual superstructure over urban services "Smart Shopping"           |
|                      | "Smart stops"                                                                       |
|                      | "People's control" - a resource for conscious citizens of housing and communal services |
|                      | "Safe City"                                                                         |
| St. Petersburg        | "Our Petersburg"                                                                   |
| Kazan                 | "Innopolis" Smart City Kazan "                                                      |
|                      | "Safe City"                                                                         |
| Ekaterinburg          | "Smart Lighting"                                                                    |
|                      | "Smart construction"                                                                |
| Rostov-on-Don         | "Comfortable environment"                                                           |
|                      | "Smart stop"                                                                        |
| Volzhsky              | "Smart construction"                                                                |
| Ulyanovsk             | "Smart City"                                                                        |

Managing sustainable development today is the primary task for smart cities. A prerequisite for such development are the three most important components [6]:

- availability of ICT infrastructure providing new services.
- providing an organized and effective management system.
- “Smart” users as the main element and driving force of “smart” cities.

In accordance with this concept, in Voronezh there is a need to create an innovation and technology center, the main areas of activity of which will be science and entrepreneurship in the development of Smart City, IT technologies, as well as centers of culture and art, tele-multimedia and animation. The
location in the common zone of the first IT technoparks in the region and creative industries is a strategically important project for the Voronezh region. Engineering, transport, social and innovation infrastructure created during the project, will contribute to the clustering of other major investment projects, including innovative ones. Technopolis is a complex system of interaction between business, education, science and creativity, a platform for collaboration in order to create innovative projects - engines of economic development, first of all, of the regional economy.

2. Formulation of the problem
The placement of the technopolis of the new generation and the satellite city of Solnechny is expected in the Ramonsky district of the Voronezh region, near the territory of the City Park Grad. The planning core of this territory is a basic social landmark with a large developed leisure component - the City Park “Grad” shopping and entertainment complex, which is currently in need of additional infrastructure development. It is necessary to build modern facilities for living, both temporary and permanent, to create an independent modern space of the urban environment, allowing to realize the idea - “we live, learn and treat ourselves in one place, work and spend our leisure time (culturally enriched, play sports, have fun, etc. .d.)". The project provides for integrated planning of development and use of the territory in accordance with the concept of "smart city" [7-9].

According to the Methodological Recommendations for the formation of regional projects "Smart Cities of the Subject of the Russian Federation" [10-12], regional projects should include measures to digitize the urban economy sectors in the following areas:
1. Housing and communal services:
   - power supply, heat supply, gas supply, water supply and water disposal, including measures aimed at implementing the concept of “smart water utility”, accounting for communal resources and reducing their costs, simplifying payment procedures, and so on;
   - management of housing stock and maintenance (repair, cleaning) of apartment buildings, public buildings, house territories, including major repairs.
2. Collection, transportation, treatment, disposal, disposal, disposal of solid municipal waste;
3. Monitoring and environmental protection;
4. Streets and public spaces (including street lighting, maintaining accessibility of the environment - cleaning, renovation, modernization);
5. Public safety;
6. Transport, road network and transportation;
7. City Administration:
   - development of platforms for managing urban resources and services "Smart City"
   - housing inspections;
   - management of land and property relations;
   - participation of residents in the processes of urban management: monitoring, control and selection of decisions;
8. Other (social sphere):
   - culture, sport, recreation, tourism;
   - social protection of the population;
   - employment and support of small service business: the provision of data and analytics;
   - health care;
   - education.
3. Suggestions and Results of Implementation

Functionally, the following objects of the designed innograd can be distinguished: residential real estate (of different segments and number of floors), social infrastructure objects (including museums, kindergartens, children's school), commercial real estate, recreational zone, technopolis, cultural policy and business with appropriate needs for innovative and high-tech infrastructure companies: technology parks, university, residence, conference hall for large-scale business events, office buildings, a hotel and a restaurant. The total area of the Technopolis will be 11.1 hectares, cultural policy - 48.7 hectares and a business polis - 9.5 hectares.

The location of residential areas on different sides of the M4-Don road involves solving the transportation problem of communicating functional objects among themselves, and also provides for a number of environmental and noise protection measures. The beginning of the construction of the technopolis is planned in 2020. It is planned to attract high-class professionals to Innograd, and on the basis of the Voronezh State Technical University, training has been launched for specialties in demand in the high-tech sector according to programs adapted to actual business needs.

Regardless of the activities laid down in the creation of a smart territory, the resulting solutions and the implemented processes of the Smart City direction will ensure the implementation of five key principles of the technopolis [13-15]:

- focus on the person;
- manufacturability of urban infrastructure;
- improving the quality of urban resource management;
- comfortable and safe environment;
- accent on economic efficiency, including the service component of the urban environment.

For the successful implementation of such a project, it is necessary to apply an integrated approach to the development of the territory, the placement of municipal social infrastructure (educational, medical, sports), as well as solve a number of important issues related to roads, transport [16-18]. To improve the efficiency of digitalization of the management processes at facilities in the Voronezh Region and the development of the technological ecosystem, it is proposed to create a unified digital management platform that closes all areas of city life together [19-21].

The first step in creating a technopolis is the digitalization of reality, the creation of huge arrays in GIS and BIM formats. All of them are included in the solution of a smart city on the terms of mutual cooperation, data exchange, user orientation and solutions for a particular place and groups of clients, including communication systems and security.

Innograd Solnechny is a testing ground for the introduction of new technologies, which allows solving urban problems of different levels in conjunction with the development strategy and territorial planning of the city through the introduction of new technologies, which is an important task both for the planned territory and for the Voronezh region as a whole.

4. Conclusion

General expected effects and results from the development of the innovation cluster in the region:

- empowerment of participants in city government;
- improving the quality of education, quality of life, health, human development, the possibility of prosperity, social security, safety;
- the intellectual infrastructure of the community, the information interaction of the population and the authorities, the provision of public services for working with city data, taking into account the opinions of citizens when planning the development of the city, as well as responding to citizens' appeals;
- development of new forms of economic activity, including digital economy, knowledge economy, network economy
- improving environmental performance, including the effects of climate change, protecting, restoring and improving the local and global environment, protecting plant and animal diversity and migration, and combating pollution
- culture and public identity;
- ensuring the mobility of people moving around the city, including new types of transport, organization of parking space and reducing traffic intensity.

Achieving these effects has a main goal: improving the quality of life in cities through the introduction of innovative information technologies in the development of the urban environment, city management and human interaction with the urban environment.

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