International Journal of Engineering & Technology, 7 (4.38) (2018) 412-415

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

Basic Principles of Innovation Management in the Urban Economy of Smart-City

Anna Ilyinichna Romanova[1]*, Dmitrii Sergeevich Romanov[1], Olga Viktorovna Maksimchuk[2], Alexander Vladimirovich Voronin[3]

[1]Kazan State University of Architecture and Engineering, Russian Federation, Republic Tatarstan, 420043, Kazan, Zelenaya str., 1
[2]Volgograd State Technical University, Russian Federation, 400005, Volgograd, Lenina pr., 28
[3]Industrial University of Tyumen, Russian Federation, 126993, Tyumen, Moscow Tverskaya St., 11, GSP-3
**Corresponding author E-mail: aisofi@kgasu.ru*

Abstract

The key direction in the formation of a "smart" city is its spatial development. The principles of accessibility, openness and comfort of the urban space that creates conditions for the interaction of its inhabitants come in place of the principles of industrial, technocratic minimalism. Hence, the task of municipalities to form fundamentally new public spaces. Flexible and multifaceted. The urban economy is often identified with housing and communal services, thereby emphasizing the priority for local authorities to provide people with heat, water, electricity in front of other issues. This most important sphere, complicated by a multitude of problems, is a grateful field for innovation and application of a special economic toolkit. And it is here that there is a possibility of a qualitative innovation breakthrough, in terms of creating and developing an "intelligent" urban economy, or SMART-city.

Keywords: *SMART, smart city, innovative breakthrough.*

1. Introduction

"Today, the key task is to create conditions for the development of cities of all types that ensure the uniformity of economic and social development of the country's territories due to the growth of their own competitiveness. And the decisive role here is played not by the means of competition, but by the means of interaction and mutual assistance based on the most effective use of limited resources, first of all - intellectual ones "[3]
After decades, the fashion for satellite cities returned to Russia. The most striking projects of recent years are Skolkovo, Innopolis and SMART City Kazan. It is noteworthy that two of the most ambitious projects at the all-Russian scale are in Tatarstan at once. The state has incurred the costs of building infrastructure and social facilities - roads, kindergartens, schools and polyclinics. All other facilities are built at the expense of private-state partnerships (Table 1). Residential buildings are not supposed to be transferred to the ownership of final residents; a long-term lease scheme should be developed on advantageous terms as in the Skolkovo Innovation Center**.**

Table 1: Business and social infrastructure SEZ TVT Innopolis

An Object	Description	Area	Planning and Implementation
The First Technopark	Placement of Russian and foreign companies operating in the high-tech industry. A full range of services, the availability of the entire infrastructure for residents.	40000 sq.m	Monolithic works are completed and the glazing of the facade begins. It is planned that about 2 thousand specialists will be able to work in the technopark.
Kindergarten	A place for the development of children's talents, communication in an international environment, high standards of preschool education.	5 200 sq.m	The kindergarten is designed for 225 people
School	A modern school with high standards of quality education, international training programs and the best teachers	13094,7 sq.m Effective area – 4766,50 sq.m	The deadline for the completion of the work is 270 days. The school has a capacity of 480 people. It is planned to create three playgrounds for children of different ages, a large and a small pool, a gym, bedrooms, workshops, recreation areas, a canteen, etc. on the school grounds.
Medical Center	Equipping it with modern medical-diagnostic equipment, designed for 500 visits per shift.		326 million rubles were allocated for the construction of the facility

SMART City Kazan is able to transform Kazan, the capital of Tatarstan, into a full-fledged international business center with modern and comfortable conditions for life, work and leisure. Trends of smart cities in Russia show the desire to create an attractive investment environment with the drivers of economic growth. [7]

The project of development of the green city SMART City Kazan is one of the first examples of holistic territory planning in Russia in accordance with the concept of "smart city":

- population: ~ 58 800
- projected annual tourist flow: 337,000;
- Jobs: ~ 39,000;
- housing units: 16,620;
- Total construction area (GFA): 7 million sq.m.

SMART City Kazan is positioned as a platform for attracting investments in four major economic clusters, which should become economic drivers for the Republic of Tatarstan (Fig. 1, table 2).

Fig. 1: Industry Clusters

Table 2: Examples of the implementation of "smart cities" in Russia

	Initial Situation	Results	Smart Solutions
Scolkovo	The construction of a scientific and technological innovation complex from the ground up for the commercialization of new technologies	1. Attractive concept of city management - "city as an office" and "city as a hotel" 2. Smart solutions that give an integrated quality of the place	1. United center of city management 2. Virtual service provider 3. Infrastructure for electric vehicles 4. Intellectual network 5. Energy-efficient technologies of water and heat supply, housing maintenance 6. Innovative building management
Innopolis	Realized "from scratch" innovative IT science city for IT professionals and companies	1. City for the comfortable work and residence of IT professionals 2. 1 federal university 3. Special economic zone of technical-innovative type	1. Extensive engineering, municipal and road infrastructure 2. Unified management system of housing and communal services, based on energy-efficient technologies and informatization of processes
SMART-city	Creation of a new urban space for the development of business, educational and research activities with a view to developing promising sectors of the economy of Tatarstan	1. The social and business center 2. Special economic zone 3. Center for Education and Science 4. 4 development clusters	1. Online monitoring of resources 2. Use of storm water 3. Coordination and integration of traffic flows 4. Information tabloids at stops

The Zone of the Public Business Center will become the international business platform of the SMART City Kazan and Bolshoy Kazan project. The main business zone of SMART City Kazan will continue the tradition of the commercial center of Kazan and will become a center for the development of local enterprises and international companies operating in the region. [17]

The social and economic driver of the public and business center will be the International Exhibition and Conference Center with a total area of 42,000 square meters. m.

The total area of the territory of business activity will be 800,000 square meters. m. of commercial real estate of classes A and B. In addition to the exhibition center, it is proposed to open a hotel, shopping centers, apartments and offices.

International Airport "Kazan" and the existing Aeroexpress line allow to integrate the projects of a transit hotel, shopping center, business park and other objects of the region with a stopping platform for sustainable development of the city.

The far-sighted planning of SMART City Kazan and the placement of the center of education and science in it will allow Tatarstan to become one of the foremost regions of Russia, where students and young specialists carry on their way.

On the territory of a total area of 156,000 square meters. There will be a university campus, capable of accommodating 10,000 students.

In addition to scientific and educational institutions, there will be a sports arena, a medical center, a shopping center, a residential quarter and scientific technology parks for 5,000 jobs.

A special economic zone is a "green light" for the development of high-tech production and applied science. SEZ will provide companies engaged in Russia and CIS with tax regulations and other preferences.

SMART City Kazan is designed taking into account the preservation of the natural landscape. In addition, new "green zones" will be created, united by a kind of "green" belts.

SMART City Kazan is at the forefront of the world trends: creating conditions for sustainable development of territories and the emergence of "smart" cities.

The Republic of Tatarstan, one of the most economically developed and largest regions of Russia, is open to the experience and latest trends of the world economy.

Situated in the center of business activity, SMART City Kazan will support the status of the region as a new center of international business. Given Russia's important role in the global economy, SMART City Kazan will strengthen Tatarstan's position by establishing itself as an international business center and a center for the development of education.

This will be the contribution of the SMART City Kazan project to the world trend of sustainable development, which is followed by Tatarstan. This concept presupposes the development of all countries in the world, taking into account the vital needs of the present and future generations of people.

Designed in accordance with "green" standards, SMART City Kazan will complement the ranks of such world projects as Masdar City (UAE), Songdo (South Korea), and dozens of other "smart", eco-friendly cities.

Thus, the development of SMART City Kazan corresponds to the world trend of creating innovative, sustainable city models that meet the needs of the local population. Participation in this trend will also contribute to strengthening the position of SMART City Kazan as an international center of economic growth, where creation of jobs and attraction of investments are as important as improvement and stability of the environment.

The creation of the SMART City Kazan project is integrated not only into world trends, but also into the development strategy of Tatarstan.

SMART City Kazan is part of the project for the development of Greater Kazan (total area - 7.075 sq. Km.) - an expanded territory

that will consist of three elements: the international investment site SMART City Kazan, the satellite city of Innopolis and directly Kazan itself (Fig. 2).

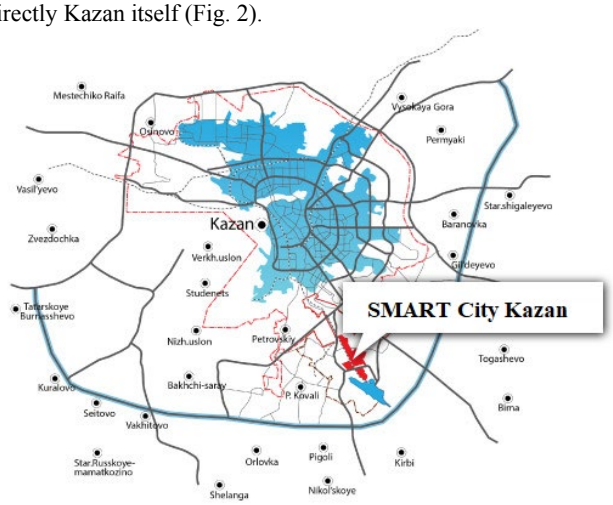

Fig. 2: Regional positioning

Project SMART City Kazan (СМАРТ Сити Казань) is located behind the southern border of the capital of Tatarstan, 15 km from the city center and adjacent to the international airport "Kazan". The development of SMART City Kazan will take place in conjunction with other projects in Greater Kazan, including: the reconstruction of the airport, as well as the creation of the Sviyazhsky Interregional Multimodal Logistics Center.

Five basic principles for the design of the territory SMART City Kazan:

1) eco-urbanism:
- harmony of urban and environmental development;
- preservation of natural vegetation;
-The guarantee of ensuring high quality of the environment is included in the project plan;

2) harmonious development:
- at the heart of SMART City Kazan - the principles of sustainable development;
- stage-by-stage development of the city;
- stimulation of multifunctional development of the territory and use of transport solutions;

3) smart location:
- SMART City Kazan will accelerate the development of the region's economy;
- The creation of sectoral clusters will benefit existing local companies, and will also help create new lines of business;

4) reduction of harmful emissions:
- Emphasis on smart technologies that allow to reduce carbon dioxide emissions into the atmosphere;
- the creation of urban space, the formation of the transport system, the infrastructure of the territory is subordinated to the idea of preserving the environment;

5) equal accessibility:
- SMART City Kazan project is a new step towards an inclusive society: education, employment opportunities, comfortable living will be accessible to all, including people with disabilities;
- great attention is paid to preserving the national color.

Profitable investment:

1) SMART City Kazan is the international business center of Russia;
2) modern world-class infrastructure: Kazan International Airport, the federal railway network, the inter-modal Aeroexpress transport line, federal roads;
3) highly skilled labor;
4) "Open" dialogue with the government of the Republic of Tatarstan;
5) fiscal and non-fiscal preferences.

SMART City Kazan is an ideal place to start projects on the Russian market and to expand the existing business.

The general plan of SMART City Kazan was developed taking into account the needs of investors, developing such areas as medicine, hi-tech production, education, tourism, and services.

The international investment technopolis offers more than 200 sites for investment projects and more than 5 million square meters. m. area for investing in real estate.

There is also Smart City of Nizhny Novgorod. A new residential micro district near the village of Novinki will become one of the largest projects for the integrated development of the territory (DOT), not only in the Nizhny Novgorod region, but also in the Volga Federal District.

Project data:
- the size of the construction site - 272 hectares;
- the number of inhabitants is 40,000;
- total building area - 1.7 million square meters. m;
- 75% of housing are classified as "compact class".

If we compare Smart City Kazan and Smart City Nizhny Novgorod, then there are many differences, for example, in Kazan 4 clusters, and in Nizhny Novgorod there are as many as 7 clusters. For each of the seven clusters, its theme is chosen. Accordingly, the central cluster area and public institutions located on its territory are projected. (For example, in the "Literary" cluster, a library will be located.) Around the central zone there will be a school, a kindergarten, a multi-shopping center and a sports complex, which will create a comfortable urban structure.

2. Methodology

The concept of a "smart city", for example, in management consulting for complex systems consists of such key components as: integrative model, or framework; architecture (architecture); maturity model; roadmap. But the very content of the term "smart city" is still being formed. And this does not prevent active use of these words, often in different contexts and senses. Instead of the usual adjective "smart" or "smart", smart adjectives are often used: smarter, digital, connected, information, or intellectual, intelligent).

There are three main points of view on the "smart city" problem: the scientific view, the economic (urban) view and the information technology (Table 3).

Table 3: The generalized classification of definitions

The main signs of classification	Classification of Definitions		
	Ideological dimension (what is the vision of an intelligent city?)	Normative measurement (where / what sphere?)	Technological / instrumental measurement (to whom will the result of the "smart city" project be transferred?)
The purpose of creating a "smart city"	Improving the quality of life of residents	Formation of a sustainable green environment for life	Innovative working life
Elements	Services	Infrastructure	Human / social capital

3. Results

Based on their analyzed sources, we consider it expedient to single out the next concept for Smart City: Welcome. Sufficient. Heartwarming.

WELCOME:
1) modern building materials and technologies of monolithic housing construction of business class houses;
2) lift equipment with improved operational properties;
3) ecological and energy-saving materials / equipment, which improve the comfort of living and reduce the costs of further exploitation;
4) additional conveniences for residents of the house aimed at general use (concierge room, storage rooms, wheelchair, increased common areas, individual design of entrance groups).
SUFFICIENT:
1) effective planning solutions that allow you to create a comfortable living in an apartment;
2) the possibility of redevelopment and the creation of individual designs of apartments;
3) zoning of the apartment's living space (guest and private areas, storage areas for clothes, shoes and linen);
4) increased insolation of premises;
5) ground / underground parking for vehicles;
6) children's play and sports grounds;
7) landscape design in the home territory.
HEARTWARMING:
1) Internet coverage of all public places of the city;
2) the first floors of the houses are equipped with lounge zones for communicating neighbors with each other and guests;
3) a pool for use by residents designed on the sites of residential buildings (complexes), a laundry, premises for mass events (guest meetings);
4) the library zone in the residential complex;
5) medical point in the territory of the residential complex.

4. Discussion

Developed infrastructure of the national or regional economy is one of the key elements of economic development. For the first time a significant part of financial infrastructure of the economy and its impact on economic growth emerged in the work of Bagehot, W. (1873) and Schumpeter, J. A. (1911). [19, 20]. People in the "smart city" are classified according to their type: visitors or residents, and then residents by their occupation in the "smart city" - people of a free profession, employees or businessmen, etc. subdivide into a set of "communities" of city residents. [2-4, 16, 18]. The employment and interests of the "communities" form the so-called "ecosystems", under whose interests "soft infrastructures" are created to manage them. Next, a "city system" is created, which includes all the services of the city that provide services to residents and visitors (social services, transport services, etc.). And as a final link in creating a smart city, they are introduced into "solid infrastructure" - the real physical infrastructure of the city. [8-10, 12-14]
Another flat example of the "smart city" architecture can be its representation in terms of its functionality. The flat architecture of the smart city consists precisely of its stationary components, such as: "smart building" (in Russia the term "intelligent building" is popular), "smart factory", "smart house", "smart car" and "smart city infrastructure" "(Transport, electrical, etc.). [1, 5, 6, 11, 15].

5. Conclusions

The transformation of industrial cities into "smart" cities is a worldwide trend, as well as a realistic prospect for Russian cities. At the same time, the reorientation in the strategy for the development of cities, megacities and their agglomerations suggests a radical restructuring of the management system for the development of municipalities, including a change in priorities, standards, criteria, goals and objectives, performance indicators and efficiency. It requires a different assessment of the resource potential of the territory, new ways of achieving the set goals.

References

[1] W. Bagehot, Lombard Street: A Description of the Money Market, History of Economic Thought Books, McMaster University Archive for the History of Economic Thought, 1873, http://socserv.mcmaster.ca/econ/ugcm/3ll3/bagehot/lombard.html
[2] R. W. Goldsmith, Financial Structure and Development, Yale University Press, New Haven, 1969.
[3] O.B. Ganin, I.O. Ganin, "SMART CITY": perspectives and development trends, ARS ADMINISTRANDI 1 (2014) 124-135.
[4] A.N. Kirillova, Problems of managing the housing stock and the mechanism for attracting financial resources, Journal of the head and chief accountant of housing and communal services 5 (2009) 14.
[5] M.A. Kiseleva Top 10 most intelligent cities, Magazine Ogonyok "Grad of Associations" (2014) 24.
[6] B.V. Klyuev, Innovations in housing and communal services: the time of change, Journal Vestnik: Constructing.Architecture. Infrastructure 6 (2005) 6.
[7] V.V. Strelchenko, Improvement of the quality of housing and communal services on the basis of innovative development of housing and communal services, Bulletin of the National Academy of Tourism 4(20) (2011) 87-90.
[8] O.G. Timchuk, The main directions of the development of housing and communal services in Russia, Actual issues of economics and management: materials of the international, sci. Conf, RIOR, Moscow, 2011, 245-248.
[9] O.V. Bakhareva, A.I. Romanova, L.F. Talipova, et al., On the building information modeling of capital construction projects market development, Journal of Internet Banking and Commerce 21(s3) (2016) 511510.
[10] A.V. Berval, T.A. Yelokhova, Development of management methods with the use of "smart" technologies in the region (for example, the field of road and housing and communal services of the city of Kazan), Proceedings of Kazan State Architectural University 3(33) 2015 196-202.
[11] I. Cho, Homeownership and Investment in Risky Assets in Europe, Review of European Studies 6(4) (2014) 254-268.
[12] L.V. Efimenko, T.A. Shindina, New approaches to expenses management based on sustainable development strategy, European Review of Social Sciences 2(3) (2015) 28-40.
[13] A.I. Krivtsov, D.M. Kalimullin, The Model of Changes Management Information System Construction, Review of European Studies7(2) (2015) 10-14.
[14] A.I. Romanova, E.V. Ilina, E.A. Dobroserdova, et al., The movement of capital in the field of information services, Journal of Internet Banking and Commerce, No S1:010. (2010) http://www.icommercecentral.com/open-access/the-movement-of-capital-in-the-field-of-information-services.php?aid=62594 Accessed September, 2018.
[15] A.I. Romanova, G.M. Zagidullina, A.N. Afanasyeva,et al., Experience in the Region to Increase the Availability of Housing Services, Mediterranean Journal of Social Sciences 6(4) (2015) 549-554.
[16] M.N. Rumaizah, T. Roshana, H.N. Abdul, Transparency Initiatives (TI) in Construction: The Social Psychology of Human, Proceda. Social and Behavioral Sciences 50 (2012) 350-360.
[17] A.I. Romanova, A.N. Afanasyeva, A.S. Mavlyautdinov, et al., Socio-economic aspects of mortgate lending housing in Tatarstan, Journal of Economics and Financial Issues 6(S3) (2016) 268-272.
[18] A.I., Romanova, A.V. Berval, E.A. Dobroserdova, ea al., The use of “Smart” Technologies in the Field of Municipal Services, International Journal of Economic Research 14(7) (2017) 23-35.
[19] J. A. Schumpeter, A Theory of Economic Development, Harvard University Press, Cambridge, 1911.
[20] The territorial body of the Federal State Statistics (1999) http://tatstat.gks.ru Accessed September, 2018.