

Innovative Infrastructure in Post-Industrial Society

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Submitted: Sep 15, 2013; **Accepted:** Nov 9, 2013; **Published:** Dec 15, 2013

Abstract: The article discusses the problems of development of regional innovative infrastructure, as well as the questions of forming a regional innovative cluster. It is shown that the creation and the development of regional infrastructure take up a significant place in the implementation of innovative policies in the Russian Federation. Innovative infrastructure would serve as a connecting joint between the creators of an innovative product and the market of goods' and services' producers; it would promote process activation in all spheres of human activity.

Key words: Innovative infrastructure • Post-industrial society • Innovative cluster

INTRODUCTION

The economic reforms in Russia that continued for more than dozens of years are not concluded with the formation of a new economic system. Huge economic and social losses are still irreparable. Domestic production lost its position in the world and internal markets [1]. The problems of structural deformation and long-term country development also remain unresolved. All this indicates that the system is unstable and that the critical points of transformation have passed.

The term «transformation of economic systems» has a complex meaning. The Russian economic system is an open system with non-linear connections that is under the influence of both external and internal factors. One of these factors that greatly impact the changes in the economic system is the innovative activity, innovative infrastructure.

The effectiveness of the innovative activity is, in many ways, determined by the innovative infrastructure [3]. That is why the innovative infrastructure is the basic component of an innovative economy, the scientific and industrial potential of the society. The innovative infrastructure predetermines the speed of the country economy development. The innovative infrastructure has to contain a number of following characteristics: the spread in different regions as innovative-technological centers or engineering firms that can locally resolve the tasks of the functionally full innovative cycle; the universal approach that allows to perform the

implementation of the innovative project on all the supporting functions; the professionalism that is based on the scrupulous and high quality client or consumer servicing; the priority that is provided by the orientation for the unique final result; the high level of scientific and technical potential; the availability of human resources, first of all, by the managers of innovative projects and the opportunity for constant rotation and the professionalism of the staff of the innovative infrastructure; the financial security; the structuredness, *i.e.* the high level of instrumental means that are accelerating the receipt of the final result; the adaptiveness that provides for the accommodation of the innovative infrastructure to the changes of the market requirement and the external environment.

The creation and the development of the regional innovative infrastructure take up a significant place in the implementation of innovative policies of the Russian Federation. The innovative infrastructure would serve as a connecting joint between the creators of an innovative product and the market of goods' and services' producers; it contributed to the activation of processes in all spheres of human activity.

RESULTS

The subjects of innovative infrastructure today have to be, first of all, oriented on solving the tasks of the social and economical development of the regions. A spontaneous creation of innovative infrastructure objects

without their clear interaction between each other and the state administrative authorities locally will not solve the task of the wide development of innovative activity to lift the economy and increase the standard of living of the regions. It is necessary to form a system of innovative infrastructure subject management on the regional level that has to provide a stable and competitive, in terms of the timeline, cycle of «looking for an innovation - developing -perfecting production - market entrance», as well as the move in the production sphere from the principle «we master what we can produce» to the principle «we master what will be competitive». This move can be performed due to the development of the innovative infrastructure and activation of innovative activity of producers of goods and services which should create excitement in the research and development market and their orientation to the needs of the region [6, 8].

The main obstacles in the development of the regional innovative infrastructure at the present moment are still the following: the absence of connections between the developers and the consumers of innovations, lack of informational transparency and low motivation to develop, finance and commercially sell innovations.

Now, within the limits of the Russian Federation, the first models of new economy are developed: new in its level innovative and technological platforms, technology development and research and production zones, technopark structures of the new generation, regional scientific and technological clusters, industrial districts and other centers, oriented on mastering high tech and innovations, are created.

However, among the existing scientific and production systems the biggest prospects of the development of the regional innovative infrastructure, in our opinion, are in creating and developing the regional innovative and informational cluster.

According to the classical definition of M. Porter, «a cluster is a group of geographically neighboring interacting companies (suppliers, producers, etc.) and related to them organizations (educational establishments, state administrative authorities, infrastructure companies) working in a certain field and complementing each other».

The stated approach supposes the organization of clusters formed on territories of companies that fulfill different functions, but are united by one technological process, the result of which is the final product created by the efforts of all the participants of the process from science to the human resource training of technicians, packers, transport workers and the dealer network.

The need to transition to a post-industrial society is closely connected with the change in the character of impact of the scientific and technical progress on people's lives. At the end of the 20th century, the speed of change of the technological pattern in the production, technologies of providing products and services and the management of these processes has significantly increased [6]. If at the beginning and even in the middle of the century these changes happened during the time periods that significantly exceeded the lifespan of one-two generations, then today, the switch of the technological structure takes a shorter period. At the same time, the way the majority of the population lives, the social and psychological model of behavior of people and the society overall are dramatically changing. One of the most important indicators of the change in the way of life in the second part of our century is the development and use of new information and communication technologies in all of the spheres of social life and activity, the level of production and consumption of information products and services by the society.

Everything mentioned above determines the need to develop the informational and communication component of the innovative infrastructure as a way of transitioning to the post-industrial society.

Therefore, in order to accelerate the transition to the post-industrial society, it is necessary to develop the regional innovative infrastructure based on the creation of regional innovative informational clusters that we understand as a community of geographically concentrated closely connected industries that together contribute to the growth of innovative competitiveness of the region from the development of informational and communicative technologies, simplification of the access to new technologies, distribution of risks and decrease in transaction expenses.

The Republic of Tatarstan has all the competitive advantages necessary for successful innovative development - the beneficial geographical position, significant natural resources, developed agriculture, strong industrial production and, mainly, highly qualified human resources. The key approach in creating a competitive national economy is the innovative approach, i.e. changes in the forms and methods of economy management, implementation of new, innovative technologies into the production, creation of the system of innovative education.

In relation to this, the development and implementation of high tech science-intensive projects, including the ones with the export potential, is most

important. As of today, Tatarstan has the most important asset for successful development - highly educated, qualified human resources. It is, by right, considered to be one of the leading scientific and educational centers in Russia. many scientific discoveries of the world importance such as non-Euclidean geometry, the fundamentals of organic chemistry, the effect of paramagnetic vibration that became the basis of modern tomographs, were made specifically in Kazan State University, one of the oldest Universities in Russia. Today, there is active work done in Kazan on the leading aspects of chemical science and technology: supermolecular chemistry, metal complex catalysis, petrochemistry and biotechnology, chemistry and technology of high molecular compounds connected with physical and mathematical modeling and design of energy and resource-preserving technologies of production of new products. There are more than 80 higher educational institutions functioning in the republic in total and around 100 scientific and research institutes and design offices, there is a functioning Academy of Sciences of Tatarstan, the center of the Russian Academy of Sciences that unites several academic institutes of all-Russian importance.

The problems of stable economic growth based on innovations form at the junction of science and production, fundamental and applied formulations and that is what their complexity and ambiguity is caused by.

The innovations that are materialized in new scientific knowledge, products, technologies, services, equipment, human resource qualification, production organization are the main factors of competitiveness in all economically developed countries. The proportion of the increase in the

gross domestic product (hereinafter - GDP) due to innovations in these countries is more than 75%. One percent of GDP growth gives 0.7% of budget growth in economically developed countries that is why the provision of stable innovative development will allow to solve such an important task of state policy implementation as supporting the competitiveness of the economy of Tatarstan and the achievement of a high standard of living for its population.

The demand for product and technical and technological innovations from Russian organizations is very low. During the last dozen of years, the scale of innovative activity in the Russian economy is quite low.

It is necessary to consolidate the efforts and resources that are available for Tatarstan to solve the key task, i.e. the stable economic growth in the region. This will be possible when the connection between the fundamental and applied science is strengthened, on the one hand, by production of innovative products and, on the other hand, by market gain. The program should not only encourage solving the aforementioned problems and eliminating negative tendencies, but also actively develop the technology transfer. In relation to this, the priorities are the creation and start of the mechanisms of development of the civilized market of intellectual and industrial property, training the staff of organizations in innovative management, creating an informational database of innovations that will simplify the search of production sites and technologies to provide for the innovative process, the promotion of own innovative products and technologies into other Russian Federation subjects as well as the neighboring countries and beyond.

Table 1: Indicators of the innovative activity of the PFD regions in 2012.

Name of the region	The percentage of organizations that perform innovative activity in the total number of the organizations studied, in %	The percentage of innovative products in the total volume of the unloaded products of innovatively active companies, in %
The Russian Federation	14.4	17.6
The Republic of Tatarstan	17.3	23.5
The Republic of Bashkiria	11.7	8
The Republic of Mari El	5.6	2.8
The Republic of Mordovia	9.6	35.6
The Udmurtian Republic	12.9	5.4
The Chuvash Republic	17.6	8.8
The Kirov Region	8	7.1
The Nizhny Novgorod Region	13.5	3.3
The Orenburg Region	14.9	6.8
The Perm Region	23.2	23
The Penza Region	8.6	14
The Samara Region	17.8	35.6
The Saratov Region	8.5	29.7
The Ulyanovsk Region	8.2	43.4

The strategic and tactical republican policy in the area of innovations should stipulate the solution of legislative and financial problems, the perfection of ways and methods of innovation implementation; it should provide financial support from the republica state authorities, work with venture financing, support interactions of small and large business in the sphere of innovations, develop the system of technoparks and business incubators.

All this stipulates the importance of creating a system of innovative activity in the Republic of Tatarstan which will allow to resolve the most important problems in the sphere of innovations.

CONCLUSION

The given analysis of the state of the innovative infrastructure allows us to make a conclusion that there are serious disbalances in the creation of infrastructure organizations. If, in terms of the areas of focus, there is a quite well-developed system, then in other areas the work has practically not been started. A serious task for the nearest future is the creation of such an infrastructure of innovative activity that allows to provide for the necessary balance of resources of innovative companies.

REFERENCES

1. Melnik, A.N. and O.N. Mustafina, 2013. The Organization of Russian Power Market in Modern Conditions. *Middle-East Journal of Scientific Research*, 13: 91-94.
2. Glebova, I., D. Rodnyansky, R. Sadyrtinov, R. Khabibrakhmanova and Y. Yasnitskaya, 2013. Evaluation of Corporate Social Responsibility of Russian Companies Based on Nonfinancial Reporting. *Middle-East Journal of Scientific Research*, 13: 143-148.
3. Ioup, J.W., M.L. Gendron and M.C. Lohrenz, 1999. Vector Map Data Compression with Wavelets. In the proceedings of the 1999 Symposium on Advanced Moving-Map Displays held by the US Naval Research Laboratory Detachment at the NASA Stennis Space Centre, Mississippi, pp: 346-465.
4. Bolton, R.N. and K.N. Lemon, 1999. A Dynamic Model of Customers' Usage of Services: Usage as an Antecedent and Consequence of Satisfaction. *Journal of Marketing Research*, 36(2): 171-186.
5. Bagautdinova, N.G., I.R. Gafurov, N.V. Kalenskaya and A.Z. Novenkova, 2012. The Regional Development Strategy based on Territorial Marketing (the Case of Russia). *The World Applied Sciences Journal*, 18: 179-184.
6. Cadotte, E.R., R.B. Woodruff and R.L. Jenkins, 1987. Expectations and Norms in Models of Consumer Satisfaction. *Journal of Marketing Res.*, 24: 305-314.
7. Deming, W.E., 1982. *Quality, Productivity and Competitive Position*. Cambridge: MA: MIT Press, pp: 324.
8. Safiullin, M.R., L.A. Elstin and A.I. Shakirova, 2012. Evaluation of Business and Economic Activity as a Short-Term Forecasting Tool. *Herald of the Russian Academy of Sciences*, 4: 290-294.
9. Novenkova, A.Z., N.V. Kalenskaya and I.R. Gafurov, 2013. Marketing of Educational Services: Research on Service Providers Satisfaction. *Procedia Economics and Finance*, 5: 667-676.
10. Bagautdinova, N.G., I.V. Goncharova, E.Y. Shurkina, A.V. Sarkin, B.A. Averyanov and A.A. Svirina, 2013. Entrepreneurial Development in a Corrupted Environment. *Procedia Economics and Finance*, 5: 73-82.
11. Kamasheva, A., J. Kolesnikova, E. Karasik and E. Salyakhov, 2013. Discrimination and Inequality in the Labor Market. *Procedia Economics and Finance*, 5: 386-392.
12. Panasyuk, M.V., E.M. Pudovik and M.E. Sabirova, 2013. Optimization of Regional Passenger Bus Traffic Network. *Procedia Economics and Finance*, 5: 589-596.
13. Aussem, A. and F. Murtagh, 2001. Web Traffic Demand Forecasting Using Wavelet-based Multiscale Decomposition. *International Journal of Intelligent Systems*, 16: 215-236.
14. Fischer, P., G. Baudoux and J. Wouters, 2003. Wavpred: A Wavelet-based Algorithm for the Prediction of Transmembrane Proteins. *Comm. Math. Sci.*, 1(1): 44-56.