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FORESIGHT TECHNOLOGY TO STIMULATE INNOVATIVE ACTIVITY: OPPORTUNITIES AND RESTRICTIONS

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Abstract

The article deals with the influence of a regional foresight technology on stimulation of innovative activity. It studies the factors affecting the innovative activity and highlights the tasks that should be accomplished for the innovative activity expansion. The role of foresight in the system of factors that influence the innovation activity in regions is determined. A comparative analysis of traditional and rapid foresight technologies is made from the point of view of innovative activity revitalization in regions. The Rapid Foresight technology is aimed at the development of specific projects. In a limited amount of time, however, only the main points of the projects can be planned. In addition, the projects are largely based on the ideas that already existed during the preparation for foresight. The research places an emphasis on the advantages and restrictions of traditional and rapid foresight technologies for the stimulation of innovative activity. Foresight is defined as an organized technology for strategic management based on reflexive interaction between the holders of key management interests. This technology makes it possible to shape a coordinated idea of the future and provides a mutual dialogue training, stimulates development of innovations and contains the self-realization potential of the developed image of the future. The paper proposes the development of foresight methods to improve the simulating function of foresight.

Keywords: Foresight, region, technology, methods, innovative activity, Rapid Foresight.

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1. Introduction

Since the early 2000s, a new way of working with the future called foresight has spread in Russia. Relative novelty of Foresight is explained by the fact that the development of the image of the future involves the methods from different spheres and sciences, which makes it possible to obtain new results. Originally, foresight was associated with long-term forecasting of scientific and technological development of the society, then its application was extended to economic and social problems.

The foresight technology is developing. Today it is possible to identify two directions: classical Foresight (traditional) and Rapid Foresight.

The first direction includes the forecast of scientific and technological development of Russia until 2030; sectoral, regional and thematic foresights which have been made since 1980 in different countries and also since 2006 in a number of Russian regions and sectors.

"Foresight - education of 2035" and "National Technological Initiative Foresight" were related to Rapid Foresight carried out from 2008 to 2017 in Russia. They were devoted to the creation of new branches in which Russia will take a leading place in 2035. "Foresight fleets" have been performed since 2012 mainly on the regional level.

Foresight spreading makes it relevant to identify potential and capabilities of the regional Foresight in terms of its influence on innovative activity in regions, and also on the adoption of innovations in urban development (Dayneko, Dayneko, Peshkov, & Kalyuzhnova, 2017).

2. Problem Statement

The problem of innovative activity in regions is connected with the need to increase the growth rate of the Russian economy and its competitiveness in the world markets, which requires the diversification of the economy, production and technologies. It is important to create new technologies in the context of foreign economic sanctions that inhibit the adoption of technologies (Gokhberg, Kuznetsova, & Rud, 2010), which increases the importance of research into innovation activity factors.

It is necessary to define what innovations we mean. According to Eurostat, they include: grocery, process and information, organizational and marketing innovations.

Moreover, the original methods of work with clients, innovative ways of cooperation with them and other external partners are of great importance for the companies of intellectual services sector as the latter consists of integration of specific professional knowledge for the creation of innovative solutions (Amara, Landry & Doloreux, 2009). From this point of view, the most important sources of innovations are knowledge and information (Doloreux & Shearmur, 2010).

Regions, as the economic subjects of competition, can influence greatly the development of different innovations. There are a number of researches that indicate the factors determining innovative activity of regions. In particular, the Institute of Statistical Research of National Research University Higher School of Economics identifies the index of innovations in regions (Gokhberg, 2017).

According to the analysis, the regions are ranked and grouped according to similar innovation activity conditions.

Three top leaders according to the rating of innovative development in 2014 and 2015 include the Republic of Tatarstan, Moscow and St. Petersburg.

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The quality of innovative policy can greatly improve the innovative activity in the region. Coordinated actions in the field of innovative development from authorities, companies, universities and scientific organizations have long-term impact.

Regional foresight is closely connected with regional innovative policy. Regional foresights can be initiated by the authorities, business and science. Nevertheless, regional authorities do not have to be engaged in foresight and carry out any support as the ideology of foresight itself is based on the communication of stakeholders of the region, including the authorities. It cannot be carried out without the consent of authorities [1]. Moreover, foresight is aimed at coordinated interaction of different sides. All things considered, an important task of the foresight idea implementation is mastering the communication management (Peshkov & Komarov, 2011).

The other authors (Makarov, Ayvazyan & Afanasyev, 2016) claim that a resource of innovative activity in the regions is a general innovative space which is defined as a general infrastructure of innovative activity.

The importance of innovative activity development in the region is based on the theory of evolutionary economy of innovations where the innovation is a result of close cooperation and exchange of knowledge between firms, universities, the public and private research organizations and specialized companies. Various forms of internal and external interaction lead to the creation and use of the knowledge. Therefore, it is necessary to stimulate the interaction in the innovative system of a region (Zemtsov, Barinova, Pankratov, & Kutsenko, 2016).

Thus, the region can greatly influence the innovations through innovative policy, both creation and increase in the size of innovative space and interaction in it.

Foresight can be defined as follows: it is an organized technology of strategic management based on reflexive interaction of the holders of key management interests, which enables the creation of a coordinated idea of the future and provides a mutual dialogue training, stimulates development of innovations and contains the potential for self-realization of the developed image of the future.

Studying the foresight technology and the ways to stimulate innovations through foresight is a topical issue of the research. The foresight effectiveness and its assessment are also important. There exist two opinions on the foresight: 1. we cannot assess foresight because it is a long-term program; 2. we can assess the foresight procedure only. In practice, however, the foresight assessment has not been developed yet.

3. Research Questions

In the previous paper we accentuated the following directions of foresight influence on innovative development:

1. Determination of prospective zones where new technologies, products and markets related to scientific and technical achievements may appear.

[1] It is worth noting that after the governor of the Irkutsk region who had initiated the Pilot project of regional foresight in 2006-7 left his office, the following governor forbade even to pronounce the word "foresight", as well as “agglomeration”, “clusters” and therefore the subjects of foresight and agglomeration were actually closed in the region for 10 years and were renewed only in 2017.

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2. Identification of prospective directions of scientific studies supplemented by social and ecological aspects.
3. Formulation of the society demands for new products and technologies, based on the revealed problems and prospective needs.
4. Establishment of the state priorities for scientific research.
5. Identification of key participants in the innovative process and their research and technological groundwork, involvement of all the parties concerned in the interaction.
6. Creation of networks of qualified and influential experts.
7. Establishment of priorities for long-term innovative, technological and scientific policies [9].

The previous ten-year period shows that performing foresight does not mean an instant implementation of regional development lines determined in foresight. For example, a prospective direction of the Irkutsk region development according to 2006 regional foresight was the creation of agglomeration, biomedical and tourist clusters (Tretiak & Kalyuzhnov, 2008).

The main issue of the research is the study of different foresight approaches in terms of their impact on stimulation of innovative activity in the region.

4. Purpose of the Study

The purpose of the study is to identify the ways to increase the stimulating role of foresight in the development of regional innovation.

A preliminary hypothesis based on practical participation in the regional foresights is that the traditional regional foresight methods do not contain the ways of implementation of the vision and must be supplemented with the methods solving the problem of the developed foresight implementation.

For the development of innovative activity, apart from the directions stated above, it is important:

1. To determine the trends of socioeconomic and technological development and their consequences.
2. To identify the consumer problems to be solved depending on the level and specificity of foresight.
4. To formulate new ideas for solving the identified problems.
5. To devise a method to implement the ideas (funding mechanism, organization method, etc.)
6. To create a circle of innovators i.e. the people capable to implement the offered ideas and projects in life.
7. To provide continuity of foresight solutions in regional policy.

Let us address the foresight technology from the viewpoint of its capability to solve the indicated problems. To this end, we will consider classical foresight and rapid foresight, compare these technologies and define their capabilities and downsides.

5. Research Methods

The method of research is a comparative analysis of the technology and methods of traditional regional foresight and Rapid Foresight in terms of innovative development stimulation.

The set of methods includes a quantitative analysis, identification of the connection between regional foresights and the innovation activity rating.

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To determine the differences between traditional and Rapid foresight, it is necessary to define the concept of technology. From our point of view, it is a detailed description of a result and steps by which it is achieved.

Regional foresight has a number of distinctive features:

1. A narrower range of technologies meeting the interests of the region.
2. An emphasis on the territory, sectors that are the object of management from regional authorities
3. Connection with regional development plans, with the scheme of development and placement of productive forces of the region and with the choice of regional strategy though it is not identical to these documents.
4. The choice of technologies taking into account the problems of the territory.
5. Social orientation of the regional foresight.

Classical (traditional) regional foresight technology includes the following steps:

Step 1. A foresight analysis and review: selection of directions and priorities; analysis of methods, content, problems and challenges, management of foresight project, collection of background information.

Step 2. Foresight development.

1. Identification of region future vision by different sectors of the society: science, business, government, population.
2. Assessment of the markets and needs of the region.
3. Scanning (or monitoring) of the status of researches and developments.
4. Formation of expert groups.
5. Survey of experts (in several stages), processing of results.
6. The choice of the priority directions considering the information obtained in the first stage, assessment of the markets and needs of the region.
7. Organization of public discussion of the foresight model.
8. Approval and distribution of foresight results.

Step 3. Presentation of the foresight results.

In 2017, Russia launched the large-scale “Foresight navigation” project. Under the project, 12 regions carried out regional foresights based on Rapid Foresight methodology improved by the Agency for Strategic Initiatives (ASI). The methodology of Rapid Foresight can be considered as a modernized technology of regional foresight. This methodology is presented in the manual (Miles, Belousova, & Chichkanov, 2017).

The specific features of the Rapid Foresight are:

1. Full immersion of foresight participants for several days
2. An algorithm of actions is prepared in advance with a strict condition to follow it and temporary restrictions.
3. The synchronized work of groups with a limit of time for each step. The step finishes with the presentation of group work at a general meeting of foresight.
4. The results – oriented activities with their representation in the form of specific projects.

A Rapid Foresight technology contains the following steps:

Step1. A preliminary study of foresight steps and selection of theme groups where the participants are supposed to play different roles.

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Step 2. Holding visiting sessions.

Sessions are carried out according to a certain algorithm that contains the following elements:

1) Determination of trends, i.e. objectively observable and measured processes, developing in a certain direction; existing and emerging trends.
2) Determination of technologies that support the existing trends or launch new ones.
3) Determination of formats, i.e. technologies of social interaction; formulation of the bills and regulations legitimizing the selected formats.
4) Determination of the bills and acts legitimizing the formats.
5) Identification of threats that can influence negatively the agents (business organizations, educational institutions, markets, etc.).
6) Development of Projects. Several different projects can be created in each thematic direction. The participants can join different groups.
7) The work is carried out with the maximum visualization.

Step 3. Summing up.

At the same time there are also shortcomings or restrictions of rapid foresight.

1. Lack of time to study the questions.
2. Insufficient scientific study of the questions, which leads first of all to a focus on organizational and marketing innovations.
3. Absence of large business participants, which limits the transfer of technology.
4. Methods for identifying and solving the consumer problems are not applied.

Experience of The Baikal Region Foresight in September 2017 demonstrates that most of the proposed projects are connected with the creation of organizational interaction between different participants and associations. In total 29 projects were put forward. The distribution of projects by type of innovation is presented in Table 1.

Table 01. Distribution of Foresight Projects in Baikal Region, 2017.

Innovation type	Number of projects	Name and/or idea of projects
Grocery	7	Extraction of Baikal deep water; Collection of wild plants; Production of drugs; Biopharmacology; The Great Baikal trail; Regeneration of the city; Biobeauty.
Process	2	Certification of food products; The House heated by crypto-boiler.
Information	12	Portal of medical services; Visit center of legal tourist ecobusiness; Baikal Brand; Baikal Gamification Center; Professional navigator; Digital economy; Digital Baikal; Pilotless monitoring.
Marketing	2	Resort “The power of Baikal»; ECO world class resort.
Organizational	5	Biomedical cluster; Baikal architecture of life; Ecomarket, Prom Purchase; Management of organization with artificial intelligence; Baikal Innovation Hub.

The methods of traditional foresight and rapid foresight are usually subdivided into 4 groups (so-called the "diamond" of foresight methods): methods of analysis, forecasting, creativity and interaction.

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They are used to determine the prospective directions and trends, and create new ideas and network communications.

6. Findings

The comparative analysis shows that the traditional foresight technology does not contain the methods directed to the foresight implementation. At the same time, in the Rapid Foresight technology, the organizational and marketing innovations prevail.

The existing foresight methods are not sufficient to solve the innovative activity problems. In our opinion, it is necessary to include the following methods in the foresight arsenal:

1) methods to reveal and solve consumer problems;

2) methods to fund the ideas;

3) methods to create the innovators circle.

Let us consider the blue ocean strategy, i.e. an increase in the value and quality at simultaneous cost cutting, and, consequently, price reduction.

It is based on the following concepts:

1) An increase in value through innovation. The innovations are aimed at creating and developing the elements of value that has never been offered before in this sector.

2) A decrease in the costs due to elimination and reduction of factors that affect the competition in a specific industry.

3) Spreading the innovations that increase value.

Given the suggestions mentioned above, the structure of foresight methods for solving the problems of innovative activity can be presented as follows (Table2).

Table 02. Foresight Methods

Function	Methods applied
Analysis and forecasting	TEEPV, SMART, BSS analysis, bibliometrics, system/structure analysis, patent and bibliographic analysis, environment scanning, relevance tree method, analysis of mutual influence, mind-mapping, Delphi Method *, key technologies method, extrapolation, modeling and simulations, scenery method, method of analogies, method of historical analogies *, multicriteria analysis, network analysis.
Creativity and consumer problem solving	Brainstorming, science fiction, essay, games, wild maps, morphological analysis, genius forecast, Disney method, morphological analysis, blue ocean method.
Interaction	Method of Delphi, expert panels, symposiums, organizing activity games, futures seminars, role playing games.
Consumer problem identification and solving	Surveys, focus groups, interview, SWOT analysis, blue ocean method.
Organisation Methods	Project method, franchising, ICO, crowdfunding, projects financed by development institutes.

As is evidenced by the analysis of foresight experience and problems, the factors of foresight success are:

1. Accurate definition of foresight purposes and their fixation. Many purposes in one project will excessively complicate the project and negatively affect its effectiveness.
2. The extent to which the foresight technology is developed and documented. Formulation of the foresight technology is an important result for its assessment because foresight suggests its repetition every 5-7 years.
3. Management of foresight based on project management approaches.
4. Fixing the results and correction of mistakes in any project including successful foresight. These results include not only the obtained data (scenarios, projects, databases), but also foresight influence on different aspects of regional life.

7. Conclusion

In the course of its formation, the foresight technology evolved into a holistic concept. Foresight is one of the ways to stimulate the creativity of individuals and communities in the process of future vision formulation and the analysis of its implementation opportunities. Consequently, the distribution of foresight ideas and results in the society stimulates the development of the foresight culture, habits and skills of working with the future and the formation of skills to devise individual strategies based on the idea of future vision of the overall picture.

It is necessary to constantly work on the improvement of foresight methods and technology. The article proposes the methods to increase the foresight efficiency. The methodology of Rapid Foresight is aimed at active work of local communities and development of new projects, which enhances its role as a mechanism of the innovative activity stimulation. At the same time, it is necessary to increase the scientificity of Rapid Foresight and involve scientists and representatives of large business in it.

It is essential to pay attention to the foresight assessment by comparing the planned goals and objectives with the achieved results of foresight.

The institutional integration of the results into the current system of regional development management and the foresight continuity in the event of a change in the power elites remain topical issues.

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