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# *Formation of a regional information centre as an institutional system in the framework of the innovative development of the industrial economy*

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***Abstract* – The effectiveness of the country economy and its individual subjects is a cumulative concept combining many indicators including the amount of resource cost for production operations, the effectiveness of the work performed, the level of implementation of advanced ideas which in combination suggests that there are industrialization processes and following the innovation path of development. It is the level of development of innovation activity that allows not only to form sets of core competences among economic agents but also to fully satisfy consumer needs, improving the standard of living and well-being of the population. Overwhelmingly, the development strategies of the regions of the Russian Federation are based on an innovative path, which predetermines the application of the principles of new industrialization throughout the country. It should be noted that the implementation of the innovative path is associated with a significant number of barriers, overcoming of which requires a systematic approach with the inclusion of not only economic agents, but also regional authorities. In this part, the priority tasks include the creation of an institution that collects, accumulates, analyzes information on existing innovation processes in the territory, defines a list of problems that impede the effective implementation of innovations, and has tools to promote innovation. Forming such an institution will allow regional authorities not only to have a full range of information on the processes taking place in the field of innovation , to respond quickly to potential changes, but also to interact with the subjects of this process in terms of providing the required level of support. Thus, it is at the level of territorial administration that a structure should be created that combines the described functions and allows all economic agents to fully implement existing ideas and projects, that is, follow the innovative path and participate in the implementation of new industrialization.**

***Keywords – innovation, economy of the region, monitoring, subjects of innovation activity, industrialization.***

## I. INTRODUCTION

An innovative development strategy for a region depends on many different aspects, the use of which separately does not lead to high-quality positive industrial changes. Thus, the implementation of the principles of new industrialization requires not only the presence on the territory of strong objects of innovation, but also the willingness to assist the authorities in introducing existing ideas and projects, which provides for the formation of a unified systematic approach with determining the role and place of each participant. Estimation of the level of innovation development of any territorial entity [1] is a difficult and complex task, assuming that regional authorities have a set of tools that allow not only collecting reliable information on the implementation of innovation activities, but also facilitating the implementation of existing ideas in terms of providing timely support.

## II. LITERATURE REVIEW

The development of innovations at the regional level is associated with the research of such scholars as Lenchuk E.B., Bortnik I.M., Mindeli L.E., Golichenko O.G. and etc. The development of the economy in the aspect of new industrialization was considered by such scientists as Volkova G.Yu.[2], Lenchuk Ye.B. [3], Bodrunov S.D., Sylin Ya. P., Ryazanov V.T., Animitsa E.G. [4], and others. The works of E. Antosenkov [5], A.E. Kogut and Rokhchin V.E., Radina O.I. and Ketova N.P. [6], Masalitina E.S. [7], Kondratiev V.V. [8], Kondrakov O.V. [9], Kutergina G.V. [10], Shyshkin A.I. [11], Shuvalova Yu.Yu. and others are devoted to the study of monitoring processes at the regional level.

## III. RESEARCH METHODOLOGY

In this study, the following methods were used:

- analysis of statistical information expressed in the construction of diagrams based on the results of processing materials of statistical compilations;

- a graphical method that manifested itself in building a model of functioning of a regional information centre, as an institution of regional authorities, connecting subjects of innovation activity;

- economic and mathematical modeling, expressed in the construction of mathematical interpretations of the monitoring processes occurring within the proposed model;

- a systematic approach representing the consideration of the entire set of elements of the innovation process at the regional level in general, as well as the functioning of the regional information centre in particular.

## IV. Analysis of research results

According to the research of the Higher School of Economics [13], the largest share of organizations engaged in innovative activities in various types of economic activity in 2016 does not exceed 11 %, which is clearly shown in Figure 1.

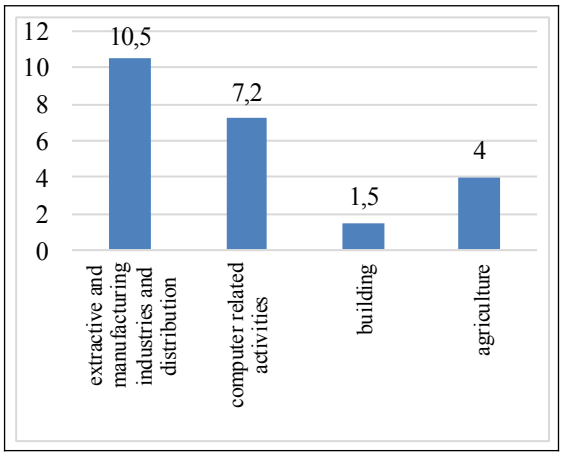


Figure 1 – Innovative activity of organizations by economic activity in 2016, %.

At the same time, the largest share is characteristic of such activities as the production of electronic components, equipment for radio, television and communications (37,2 %) and the production of pharmaceutical products (35,6 %). In addition, it is worth noting that most innovations were technological in nature, and the least were marketing. Let us consider the factors hindering the implementation of technological innovations [13], as the most significant in the structure of innovation, which are presented in Figure 2.

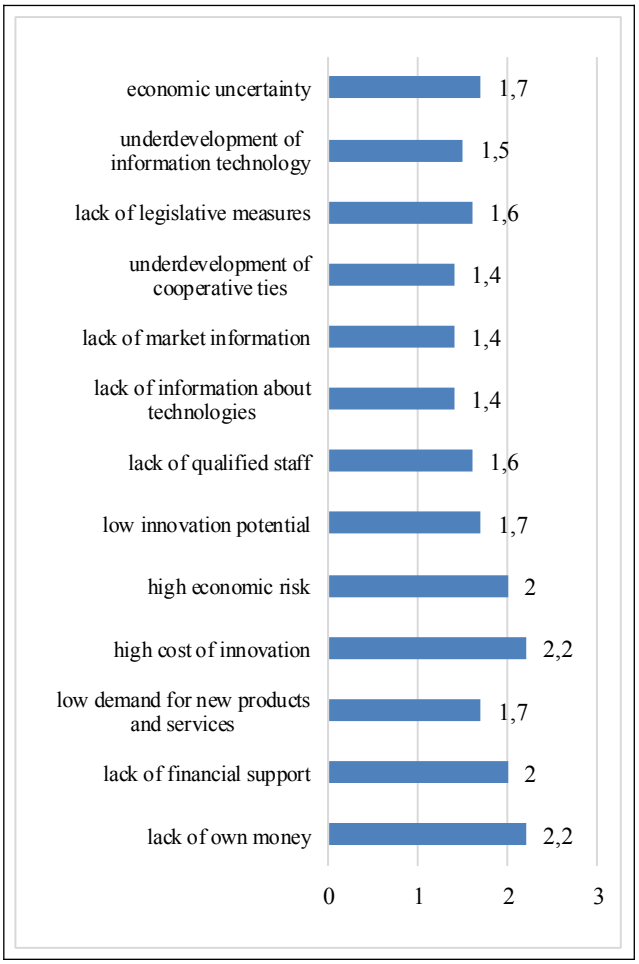


Figure 2 – Rating of factors hindering technological innovation for 2013-2015.

Among the factors hindering technological innovation, the most significant is the economic block, among which one can note high cost of innovations and the lack of own funds. Internal factors associated with the lack of information about technologies and sales markets, as well as underdevelopment of cooperative ties, have the least weight.

Thus, it can be said that there are barriers in the implementation of innovative initiatives, the reduction or elimination of the influence of which belongs to one of the tasks of the functioning of regional authorities. All the above is necessary for a consistent movement in the direction of the vector of the implementation of new industrialization, and as a result, the creations of conditions for the balanced development of the economy, increasing the investment attractiveness of the territory and the standard of living of the population. In this regard, the creation of a regional information centre (RIC) that performs these functions is reasonable and important. It is the designated centre that is a connecting element in the process of innovation activities of individual subjects, a kind of platform for facilitating the interaction of participants in order to reduce barriers to the implementation of the existing initiatives.

The general vision of the organization of work of this centre can be represented by the example of a model (Figure 3).

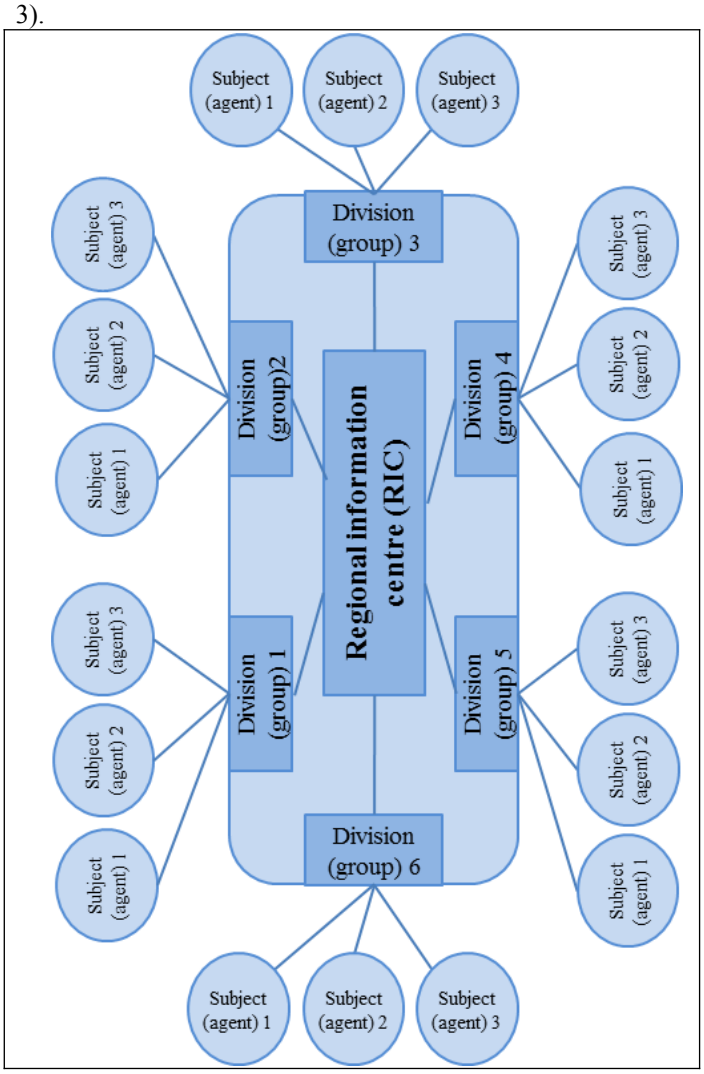


Fig. 3 The model of interaction of subjects of innovation.

In turn, the regional information centre itself is a structural subdivision of regional government bodies, consisting of blocks (united). Each block implies individual specialists (employees) or their associations (groups). Blocks are allocated on the basis of groups of subjects of innovations. The division into blocks is explained by the following features of the work of this centre:

- each group of subjects of innovation activity has its own distinctive features, which is why certain nuances arise in working with them (in terms of the procedures for organizing and regulating relationships, filling sets of documentation, etc.):
- information flows in terms of reporting on the results of innovation activities in different subjects vary, which is associated not only with the volume of innovative research conducted, but also with the costs of all types of resources.

Accordingly, the selection within the framework of this centre activity of working groups ("blocks") allows employees to fulfill their responsibilities at a higher quality level, to take into account the peculiarities of the functioning of subjects of innovation activity.

In general, the following integrated blocks can be distinguished within the framework of the regional information centre, the number of which may vary depending on the presence in the region of this type of subjects, their size, and level of involvement in the creations of innovations:

1. enterprises, businessmen of scientific, technical, industrial and service industries – these organizations can be called the main customers of innovations that solve the problems of survival in the market and increase the overall competitiveness;
2. organizations that produce innovation at a professional level (business incubators, research centers, design bureaus, higher education institutions) – in this case, institutions with the most competence in the field of innovation production are considered, including performing this activity as the main one;
3. organizations that contribute to the process of innovation (centers of intellectual property, funds to promote the development of innovation, public and non-profit organizations interested in the development of innovations in the region) – whose task is to provide specific services at individual stages of the innovation life cycle, reducing risks and shaping conditions that increase the productivity of the process of creating innovative products, services or technologies;
4. authorities or their structural units (various committees, divisions, departments) – people interested in the development of innovation, whose role is often to create tools for implementing initiatives by:

- creating a legal framework for the implementation of the innovation development process;
- creating conditions for motivating the very process of presenting innovation through the organization of a system of grants and competitions;
- implementation of existing targeted programmes aimed at supporting individual areas of economic development in a region or municipality.

In general, it is worth noting that the regional information center processes the obtained statistical data, which are necessary both for generating current reports on the performance of the economy of a region or of its individual sector, and for making forecasts or programs for its development depending on the identified trends, patterns, major problems hampering the introduction of advanced technologies and ideas, which in turn should lead to an increase in the investment attractiveness of the territory, indicators of not only the standard of living of the population, but also the entire socioeconomic system as a whole [14].

In this regard, monitoring processes are acquiring particular relevance. In this case, a double monitoring cycle is proposed, namely:

- "Vertical" is carried out within each block separately and determines the quality of the implementation of innovations by

a certain sector of the economy or a designed group of subjects of the innovation process;

- "Horizontal" is an assessment procedure conducted within the centre described, that is, a comparison of reporting by blocks, and determining the effectiveness of all innovation activities in the region.

It is on the basis of monitoring procedures that it is possible to evaluate the effectiveness of the RIC activity and, ultimately, of all the innovation activities and strategy of the region.

In general, it is worth noting that the level of innovation activity in the region can be assessed on the basis of "vertical" and "horizontal" monitoring indices.

"Vertical" monitoring can be represented in mathematical form (1):

$$M_B = (\sum_{i=1}^{n} S_1 \ (I_1 + Vv_1 + F_1 + Rp_1 + Pp_1) + S_2 (I_2 + Vv_2 + +F_2 + Rp_2 + Pp_2) + \ldots + S_n (I_n + Vv_n + F_n + Rp_n + Pp_n))/n, \quad (1)$$

Where Mb is the index of "vertical" monitoring;

S- the subject of innovation;

I – idea (clarity of description, possibility of commercialization, argumentation of the idea, integrity of perception);

Vv – a visual embodiment (clarity, depth of detail, availability of technology creation (TEC));

F – financing (availability of initial capital, the level of riskiness of the project, compliance with investment assessment indicators);

Rp – market potential (turnover, the ratio of sales volumes and production volumes, the dynamics of the number of contracts concluded);

Pp – production potential (universality of production technology, the speed of the creation of the finished product);

n – the number of subjects of innovation activity in the region [15].

Each of the indicators for evaluating the subject of innovation activity is totally limited to 0.2, based on an equal degree of participation in the process of creating an innovation. At the same time, any of them should not be less than or equal to 0, since n this case its participation in this case does not make sense. As part of the consideration of a specific subject or sphere of economic development, the set of these indicators may be different, but this interpretation suggests universal components based on the implementation stages of an innovative idea or project. The described index with an ideal state of the innovation system tends to number 1: the closer the final indicator value is to 1, the higher the level of innovation activity and the lower the barriers to the implementation are [14].

Horizontal monitoring is an assessment of factors hindering the implementation of an innovation strategy for the development of a region. These factors include:

- level of innovation support by the authorities;
- the quality of the innovation infrastructure of the region;
- the quantity and quality of the legal framework for the implementation of innovation;
- level of development of the regional sales market, etc.

"Horizontal" monitoring can also be presented in mathematical form (2):

$$M_Г = (\sum_{i=1}^{n} f \ (f1, f2, f3, \ldots, fn))/n, \quad (2)$$

Where Mg is the index of "horizontal" monitoring;

F – factors hindering the implementation of innovation activities in the region.

The influence of each of the factors described can be assessed on a scale from 0 to 1. The higher the degree of influence of a separate factor on the process of innovation, the greater the value of the indicator is assigned to it. In the ideal state of the innovation system the value of this index should tend to 0. It should be noted that theoretically, the achievement of this threshold is not possible, since it is extremely difficult to eliminate absolutely all the barriers to the implementation of innovations.

The summation of the indices described above is incorrect, since, in spite of the assessment by means of them of one process, they are based on its different components.

## V. CONCLUSION

The results presented in the research article include:

- a model of interaction between subjects of innovation activity has been formed, distinguished by the participation of a specialized institutional structure – a regional information centre that provides all forms of interaction with stakeholders through the regulation of information flows and the provision of the required level of support;
- a monitoring system has been proposed which includes "vertical" and "horizontal" cycles allowing to track all innovation processes in the region and monitor the implementation of the territory's development strategy, that is, follow the innovative development path as part of the embodiment of industrialization processes;
- a mathematical interpretation of the proposed approach is presented, which allows creating a statistical basis for evaluating innovation activities in the region within the framework of the industrial economy.

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