

Regional Features of Functioning of the Geoinformation Analytical System of Innovative Potential

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Abstract. The article touches on the method of monitoring the innovation potential within the geoinformation analytical system as a system of parameters and indicators that provide the actualization and processing of various information resources.

1. Introduction

Nowadays, the use of the innovative information technologies in management is becoming one of the essential milestones of successful development of the research areas. Modern IT-technologies are aimed at optimizing and adjusting business processes of the system, in particular, when using the program-target method, process technologies and foresight technologies. Thus, it is useful to organize monitoring with the use of the modern software that will allow building and analyzing complex models of the research processes [1].

The monitoring system is based on the deductive principle, which allows considering in detail the most important aspects (financial investment, human resources, marketing, environmental, organizational, technical, scientific) of the innovation potential, to study their dynamics depending on changing of the environmental factors, to identify "weak" points, as well as to determine the strategic reserves, formulating a compensation potential at the macro and micro levels [2,3].

The monitoring of the level of innovative potential is a consolidated information system made for the systematic compilation of economic reports on the values of the innovation potential in order to identify and eliminate destabilizing factors.

2. Methodology

The information system of the monitoring of the level of the regional innovative potential is the information web-service that implements the method of calculating the main indicators of the innovation potential level at macro and micro levels, as well as updating the received data.

An important stage in the development of the geological-economic monitoring system is the development of the method of its maintenance. Under current conditions, it is necessary to implement



it on the basis of the geographic information systems (GIS) and technologies using tools of the geographic information portals.

The main tasks of the GIS modeling of the distribution of the productive forces and the use of the mineral resources base are:

1. To maximize profits of the investors at the expense of the integrated assessment of the financed investment projects aimed at increasing of the innovative potential of business subjects.
2. To maximize the consolidated budgetary impact of the implementation of the entire set of measures.
3. To ensure the preservation and creation of new jobs associated with the increase of efficiency of the use of the innovative potential.
4. To provide a regular reassessment of the integral indicators of efficiency based on the results of the innovative projects, due to the changes in market conditions of supply and the improvement of the production technologies, processing and transportation of the final product.

The Information System of the monitoring of the regional innovative potential level (ISM) is an open resource on the Internet, including the information web-services data entry, calculation of basic indicators of the innovative development and presentation of the results in graphical and analytical forms. The information system is designed to automate the monitoring and evaluation of the innovative potential level at micro and macro levels.

The suggested method of conducting the innovation potential monitoring within the geoinformation portal as a system of parameters and indicators, providing updating and processing of the information from a variety of the information resources, its retrieval, the automated search, which includes the algorithm of parametric analysis of business subjects in order to provide federal, territorial authorities and potential investors with current economic information of the management decisions.

The information database (DB) depending on the information sources is uploaded into the system in various formats. Therefore, it was necessary to unite them into a consolidated data warehouse designed for OLAP.

Geoinformation portal has the following features:

1. Provision of the economic information in real-time 24hours and from anywhere in the world.
2. Meta-database, designed for the search of the businesses structures by keywords, category, location, and other parametric criteria.
3. Selection of the similar enterprises with the same state of the innovation potential by the set parameters in other areas and regions of Russia.
4. Cartographic visualization of the information showing all the economic indicators.
5. An analytical module, which allows identifying common factors in distribution of business subjects by forming innovative development zones. Management decision, making a support system for the government at the federal level and the level of the subjects, is being realized through this module.

Monitoring research of the innovative development of the region should include the following steps:

1. Receiving of the necessary information in accordance with the objectives of the research.
2. Assessment of the innovative potential of the enterprises, based on the analysis of its structural elements (human, scientific, financial, investment, environmental, organizational and technological), as well as conformity to the planned indicators.
3. Analysis of the state of the innovation sector of an enterprise, identification of strong and weak points.
4. Analysis of the state of the innovation sector of the municipal entity, identification of strong and weak points.
5. Assessment of the efficiency of the measures aimed at innovative development.

Thus, management of the innovation potential of the region should be a process of research, development and use of the innovative potential of each separate enterprise of the region, aimed at maximizing of the synergies of their development in accordance with the objectives of the innovation policy of the country.

The place of the information system in the structure of the monitoring research of innovative development of the region (through the example of the Bryansk region, the Russian Federation) is shown in Figure 1.

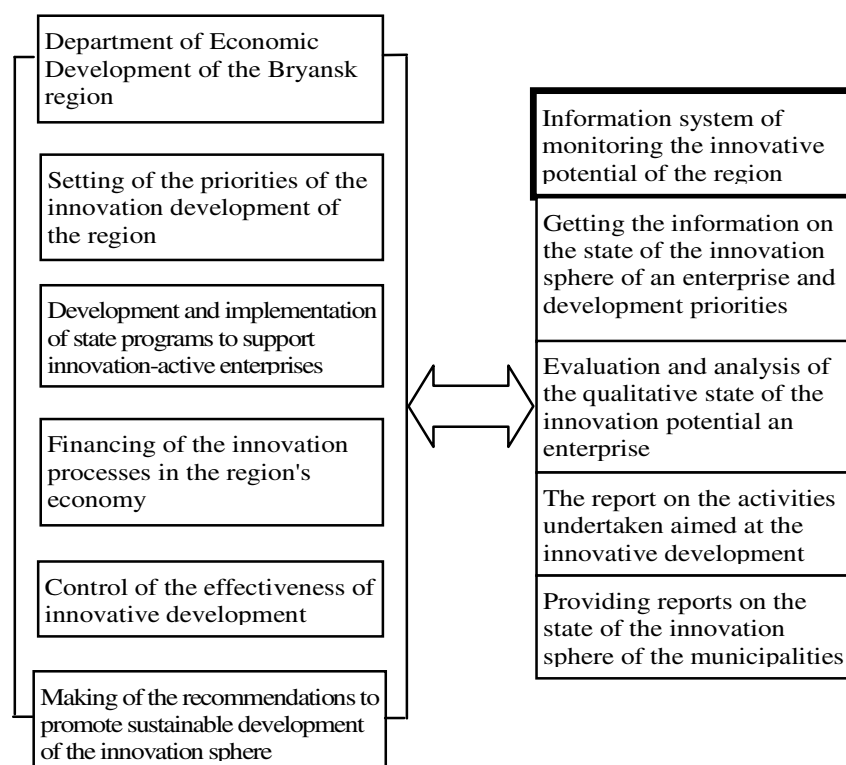


Figure 1. The place of the information system monitoring (ISM) of the innovation potential system in the structure of the monitoring research of innovative development of the region.

The keystone of the information base of the geoinformation portal is the passport of the innovative development of the enterprise, that is useful to be kept since its foundation, and which is necessary for calculating of the actual and predicted values of the studied parameters of each structural element of the innovation potential of the enterprise (financial and investment, personnel, organizational and technical, environmental, marketing). Having a consolidated information base is important for the analysis of the data in respect of dynamics from the previous periods, development of the reserves of the increase of the innovative potential of the enterprise, carrying out inter-firm analysis.

A passport of the innovative development of the enterprise is a main document that allows you to evaluate the possibilities of the innovative potential of the enterprise; the efficiency of its implementation - to create new competitive advantages and provide the expanded reproduction, its strong and weak points, and to identify the prospects of the development of the enterprise in the innovation sphere.

Development of the passport of the innovative development requires a deep study of the state of the innovation potential of the company, as well as evaluating of the necessary costs for the innovative development, and the comparison of their usefulness to the enterprise capabilities.

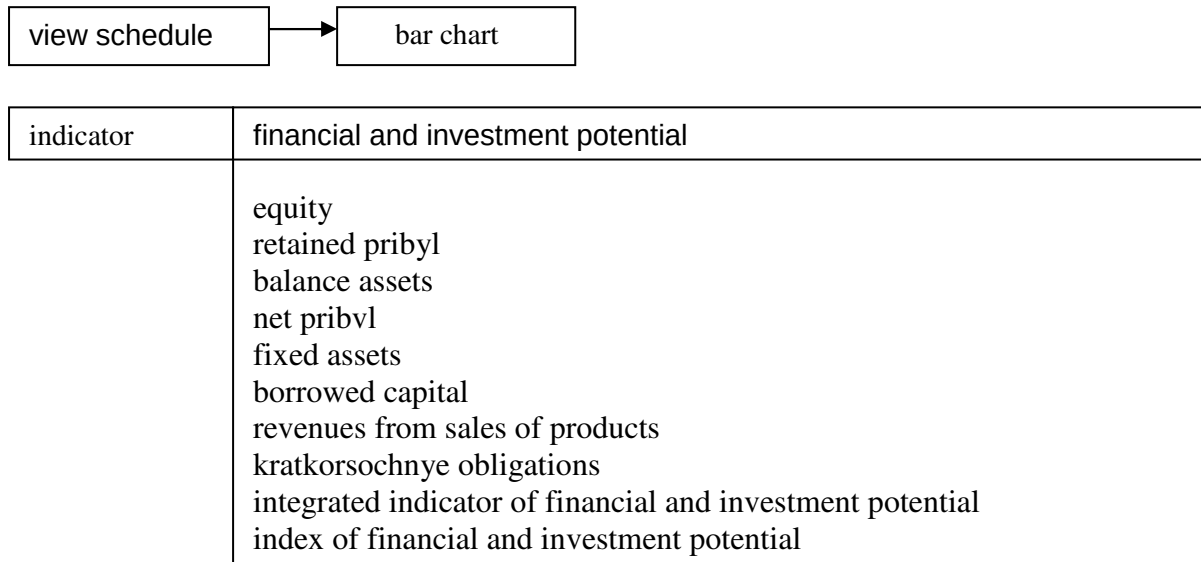
Thus, the passport is an important document for the development and adjustment of the plan of the strategic development of the enterprise, because provides objective knowledge about the status of all the subsystems responsible for the successful operation of the enterprise innovation processes (financial and investment, personnel, organizational and technical, environmental, marketing). Consequently, keeping the passport becomes an effective tool for making management decisions in the field of the innovative development and formation of the innovative business strategy.

Uploading the information to the system happens by filling in the form of the parameters used for the calculation of the coefficients for each subsystem of the innovation potential (in this case their number makes 54) [5]

Based on the uploaded data, the index of the internal potentials (personnel, scientific, organizational, technical, marketing, environmental, financial and investment) of the innovative

development of enterprises is calculated, and a complex integrated indicator of the level of the innovative potential is displayed too.

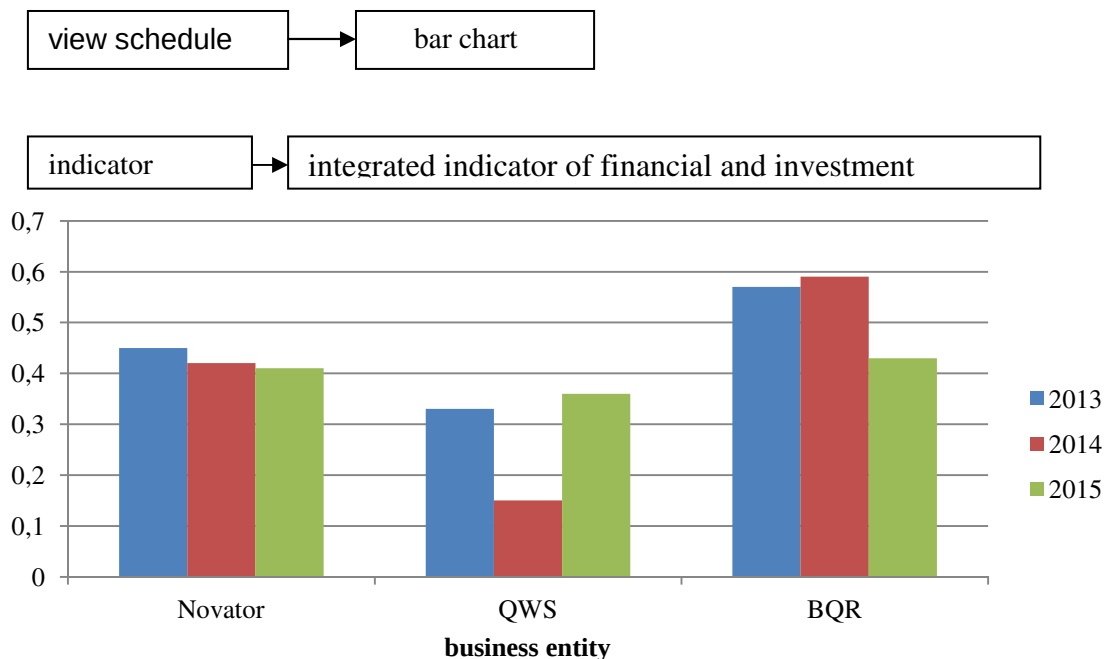
Upon request, the information can be displayed in a graphical format in the context of the analyzed indicators (Figure 2).



- Diagram type: histogram
 Indicator: net worth

Figure 2. A module of displaying the graphical information

The example of the histogram is given in Figure 3.



-Diagram type: histogram
 Indicator: integrated index

Figure 3. An example of the histogram of values of the integrated index.

The database of the information system is designed for storage and constant updating of the information about the level of the innovation development of the potential, formed as a part of an integrated monitoring system of the Bryansk region. The database is designed to settle the matters of the collection, storage and use of indicators qualifying the level of the innovation potential in regards to administrative districts and the region as a whole.

The logical model of the database of the information portal is shown in Figure 4.

ISM database contains seven tables:

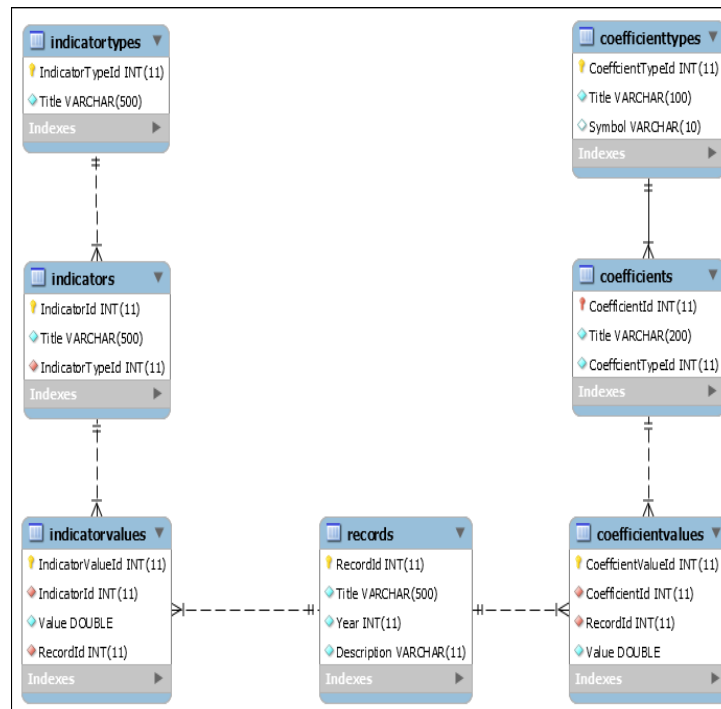


Figure 4. The logical model of the database of information systems.

- 1) The table “coefficients” contains a guidebook of the indicators, the calculation of which is carried out during estimation of the innovative potential level.
- 2) The table “coefficient types” contains information about the correlation of the coefficient with the analyzed subsystems of the innovation potential.
- 3) The table “coefficient values” contains information about the values of the studied parameters.
- 4) The table “indicators” contains a guidebook of the indicators, the calculation of which is carried out during estimation of the innovative potential level.
- 5) The table “types of indicators” (IndicatorTypes) contains the information, necessary for identification of the indicators by the subsystems of the innovation potential.
- 6) The table “indicator values” contains information about the values of the indicators of the subsystems of the innovation potential.
- 7) The table “records” contains a guidebook of the enterprises, the information on which is recorded in the ISM.

3. Conclusion

ISM modules are fully reconfigurable, that allows you to refine the system, based on the specific objectives of the monitoring research at micro- and macro-levels. In particular, one of the priorities of improving the overall system of monitoring the level of the innovation potential at the macro level is the physical realization of the automation of the association process of the administrative districts into the zones of the innovative potential of the zone by the level of development in order to develop

strategic alternatives, taking into account the specifics of the innovation potential level in each selected area.

To sum it up, it is possible to give the main benefits of the information portal in comparison with the paper-based monitoring:

1. The dynamic state of the system.
2. The ability to update in real time.
3. A 24-hour availability for users.
4. An ability to expand it with new system modules and methods of recording information according to the purposes of the research.
5. Optional outsourcing of the expert systems for analysis and decision-making.

The monitoring system of the innovation potential level is the starting point for improvement of the management of the innovation potential level of separate economic entities, which is the core at the micro-level of the whole system of monitoring.

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