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Modern Tools for Sustainable Development of Territories. Special Topic: Project Management in the Regions of Russia

DEVELOPMENT OF PRINCIPLES OF RISK ASSESSMENT IN IMPLEMENTATION OF INNOVATIVE PROJECTS

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Abstract

The development and implementation of innovative projects in the Russian market is a promising and priority area of activity. Given the rapid development of the digital economy, the development of new technological platforms in the practical implementation of innovative projects, there is a problem of risk management and assessment. The article discusses the basic principles of risk assessment in the implementation of innovative projects, identifies risks that arise in the process of economic activity of innovative and active organizations, identifies risks that arise in the process of implementing an innovative project, and suggests a method for assessing the risks of an innovative project. The authors propose the following risk management principles, the practical application of which is aimed at achieving the goals of implementing innovative projects: the principle of strategic unity of goals and objectives in the field of project management and project risks; principle of identification of project risks; the principle of reducing the likelihood of risks; the principle of constructing a risk management algorithm for innovative projects. The advantage of the proposed principles is the multivariance of the project risk management process, based on the principle of decision-making at three levels - strategic, tactical and operational - based on the use of modern information technologies. It is proved that research in the field of approaches to risk assessment can significantly expand the existing structure of innovative project management.

Keywords: Digital economy, innovation project, risk management, uncertainty accounting, uncertainty management.

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1. Introduction

According to the Decree "On National Goals and Strategic Tasks of the Development of the Russian Federation for the Period until 2024", the Government of the country has been assigned the task of Russia joining the five largest economies in the world, ensuring economic growth rates above world indicators; acceleration of technological development, increase in the number of organizations implementing technological innovations up to fifty percent. Thus, enterprises are faced with the task of making radical changes in the field of innovation management. According to the international ratings Global Competitiveness Index, Doing Index, Global Innovation Index (The Bloomberg Innovation Index, 2015; The Global Risk Report, 2019; The Global Competitiveness Report, 2018), there is a positive trend in the field of increasing innovative activity and favorable business conditions, leading to improved global indicators of innovation and economic activity (Figure 01). To achieve these goals, it is necessary to implement an integrated approach to the management of innovation, one of the aspects of which is the formation of an effective risk management mechanism.

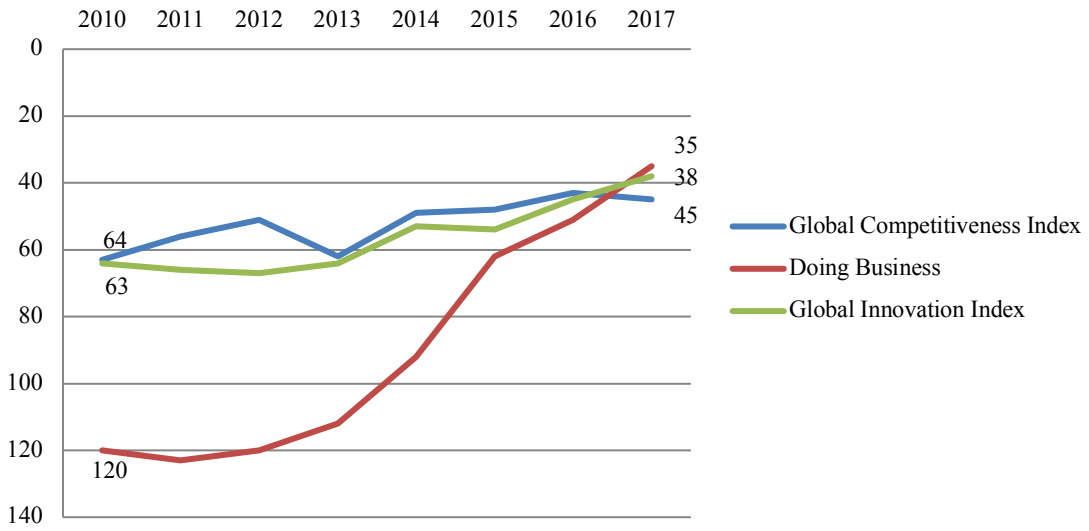

Figure 01. Dynamics of Russia's positions in international ratings Global Competitiveness Index, Doing Index, Global Innovation Index

The development and practical application of methods and models for managing innovative projects based on scientific management approaches will increase the effectiveness of the process of commercialization of innovations, as well as increase the competitiveness of Russian products in the Russian and international markets. One of the directions of innovative management development is the creation of an effective risk management mechanism. In the conditions of the functioning of a market economy, risks are an integral part of the economic, political and social life of society and accompany all areas of the operational and design activities of any organization. A prerequisite for the functioning and development of the organization is the implementation of the risk management process and the formation of the necessary risk assessment mechanism.

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2. Problem Statement

The main objectives of the study are: identification of risks arising from operating activities; formation of a list of risks specific to innovative project activities; description of the basic principles of risk management arising from the implementation of innovative projects.

3. Research Questions

The main research issues of innovative project management are multidisciplinary at the intersection of the disciplines of innovation management, project management and risk management and are aimed at systematizing existing knowledge and developing methods for managing risk of innovative projects (Raftery, 1999). The development of theories of scientific, technical and innovative management was carried out by such domestic and foreign scientists as Valdaytsev (2014), Fathudinov (2012), Pisano (2006). Risk management is a developing field of knowledge in the works of scientists Chapman (1996), Kaplan and Norton (2000), which examined approaches to identifying risks and choosing methods and approaches of risk management. Thus, the field of risk management in the implementation of innovative projects in high-tech industries is relevant for research taking into account current trends in economic development.

4. Purpose of the Study

The aim of the study is to describe the basic principles of risk management during innovative projects at the enterprise and the formation of a method for assessing the risks of innovative projects.

5. Research Methods

To achieve the objectives of the study, general scientific research methods were used, such as methods of analysis, synthesis, methods of classification and formalization of scientific data. In addition, private economic research methods were employed in the research process, for example, modeling, which includes the construction of a risk management algorithm for innovative projects.

6. Findings

The main stages of the study are to identify the risks of innovation-active organizations that arise during the implementation of innovative projects, and a description of the basic principles of risk management of innovative projects.

6.1. Identification of risks of innovatively active organizations

In modern world and Russian practice, the innovation development process is implemented mainly in the form of projects. Innovation projects are a set of interrelated activities aimed at achieving objectives in the field of creating or modernizing innovations within the established time frame, taking into account a pre-approved and economically sound budget.

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Innovative activity is characterized by an increased level of risk in the face of uncertainty in the implementation of projects. Analysis of the annual reports of some innovatively active organizations ("Mikron" PJSC, "VASO" PJSC, "Sukhoi Company" PJSC, etc.) based on the results of 2017 allowed us to identify the main risk factors (National innovation Russian Report, 2017). According to the results of the analysis, it is advisable to group potential risks as follows:

- economic risks, which include: changes in legislation (currency, tax, customs), inflation, growth in exchange rates, a change in the licensing procedure;
- foreign economic risks, which mainly include the impact of international sanctions against Russia;
- technological risks associated with the rapid global development of science and technology, technological complexity of production, deterioration of production equipment;
- market risks associated with increased competition in the domestic market, changes in working conditions with counterparties;
- financial risks associated with financial difficulties in carrying out the operational activities of organizations.

6.2. Identification of risks arising from the implementation of innovative projects

Implementation of innovative projects is associated with risks of project activities and innovative activities, which can arise linearly and predictably (for example, failure to meet the project deadlines), and combine to create new and little-studied areas of uncertainty (Paula, Silva, & Cortimiglia, 2017). In the implementation of innovative projects, in the development and implementation of the results of scientific activities in production, the most expected occurrence of the following risks.

Risks of project activities:

- inaccuracy of the project objectives;
- lack of involvement and lack of motivation of staff to achieve the goals of the innovation project;
- organizational errors (financial, economic, logistic) in the process of project management;
- unrealistically set deadlines for the project;
- economically unjustified project budget;
- inefficient use of project management tools;
- knowledge, abilities, skills of the project team do not correspond to the planned level of project implementation;
- overestimation of events that may occur with a low probability of occurrence, and underestimation of events that may occur with a high probability of occurrence.

Risks arising from the commercialization of innovation:

- lack of demand for the technology in the market;
- errors in the process of conducting a patent search;

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- implementation and realization of the project, the planned results of which are not new to the market;
- loss of exclusive rights to the technology;
- inefficient use of attracted financing in the process of commercialization;
- similar products on the market with better technological properties.

Thus, the basic principles of risk management of project innovation activities are based on a reasonable and reliable identification of risks that affect the development of the business as a whole, risks of project activities and risks arising from the commercialization of innovations.

6.3. Description of the basic principles of risk management of innovative projects

The practical implementation of the risk assessment mechanism should be based on the following principles of risk management of innovative projects.

1. The principle of strategic unity of goals and objectives in the field of project management and project risks.

It is advisable to develop a risk management strategy at the same time as the organization's overall development strategy and regularly update and supplement it. Based on the strategic provisions of the organization's risk management for each project, it is necessary to prepare a project risk management procedure with a description of the decision-making approach in various cases of risk occurrence, a description of the process of making the necessary calculations and approaches to assessing the probability values of risk occurrence. The project risk management procedure should be developed taking into account the interconnections of strategic goals, project goals, as well as probabilistic risks and uncertainties. The main objective of the procedure is to prepare a clear, logically structured mechanism for managing project risks, which each project participant will be able to use and implement in their activities.

2. The principle of identification of project risks.

The risk identification process leads to the development of a list of risks that may affect the project. For the further risk management process, it is advisable to carry out an aggregate assessment of the list of risks, to determine the likelihood of risk and to quantitatively assess the degree of risk impact on the project. SWOT analysis is an effective tool for managing external and internal factors affecting the development of a project, aimed at assessing opportunities and threats and, therefore, identifying risks. The tool should be used to analyze the causes of risks, both external and internal. It must be borne in mind that the development of an innovative project is influenced by the economic activity of the enterprise, and the degree of influence can be evaluated as a positive or a negative factor.

3. The principle of reducing the likelihood of risks.

Simulation is an effective, but difficult to implement project management tool, the application of the methods of which allows you to make the most rational decision, taking into account the least likelihood of risk factors. Conducting experiments to develop commercialization scenarios is a labor-intensive process with a high level of additional costs, building simulations using specialized software will allow you to simulate the state of the system with the least financial cost. The PMBOK project

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management guide (PMBOK guide. An American national standart, 2008) contains a section on risk management. The Guidelines identify the main cause of risks, which is uncertainty. This means that if the risk was determined in advance during the planning of the project, it means that the set of measures that should be taken in case of risk was also determined in advance. If the risk has not been determined in advance, then its occurrence can lead to large losses on the project, since the response was not planned, and its degree of impact was not evaluated from a financial and economic point of view. Thus, the construction of simulation models and their analysis leads to a decrease in the likelihood of a previously identified risk.

4. The principle of constructing a risk management algorithm for innovative projects.

The implementation of the risk management program begins simultaneously with the launch of the project. Using modern software allows you to control the occurrence of risk events, but these events must be predefined. Accordingly, the risk management process does not stop throughout the entire life cycle of the project, in the event of pre-planned events, it is advisable to respond to them in accordance with the risk management procedure, in the event of unplanned events, decisions to reduce the risk level should be made at the strategic management level.

Management of innovative projects is a multi-level structure with various implementation scenarios, which implies the adoption of complex, complex decisions. In the process of project implementation, various economic tools are used (often including the use of a complex mathematical apparatus), which include: methods of planning, forecasting, analysis and evaluation of economic efficiency and others.

When implementing innovative activities, it is advisable to consider project activity as a multi-level process aimed at achieving the goal. The proposed method for assessing the risks of an innovative project is based on the implementation of the algorithm (Figure 2), which is advisable to carry out at three levels of management – the strategic, tactical and operational levels of implementation of the innovative project.

The strategic level of decision-making is long-term in nature and determines the development of the project activities of the organization to achieve the strategic, long-term goals of the organization. At a strategic level, the portfolio of innovative projects based on analytical data is approved and planned, decisions are made on the sources of financing for projects, priorities for project activities are developed, principles of corporate social responsibility are developed. From the point of view of risk assessment, at the strategic level, the formation of a risk management strategy, verification of the planned activities taking into account compliance with project goals and strategic goals of the organization as a whole.

At the tactical level, decisions are made on how to achieve the goals set at the strategic level, what tools should be used and what resources to attract in the medium term. At the tactical level, the main processes are taking place regarding compliance with the accepted procedures, identification, assessment and planning of risks takes place, the state of the project system is monitored when risks arise.

The operational level of decision-making is of a short-term, daily nature of solving various problems – daily observance of the terms and objectives of the project. Business processes at the operational level are predominantly automated in nature (Dubitskaya & Tcukanova, 2018).

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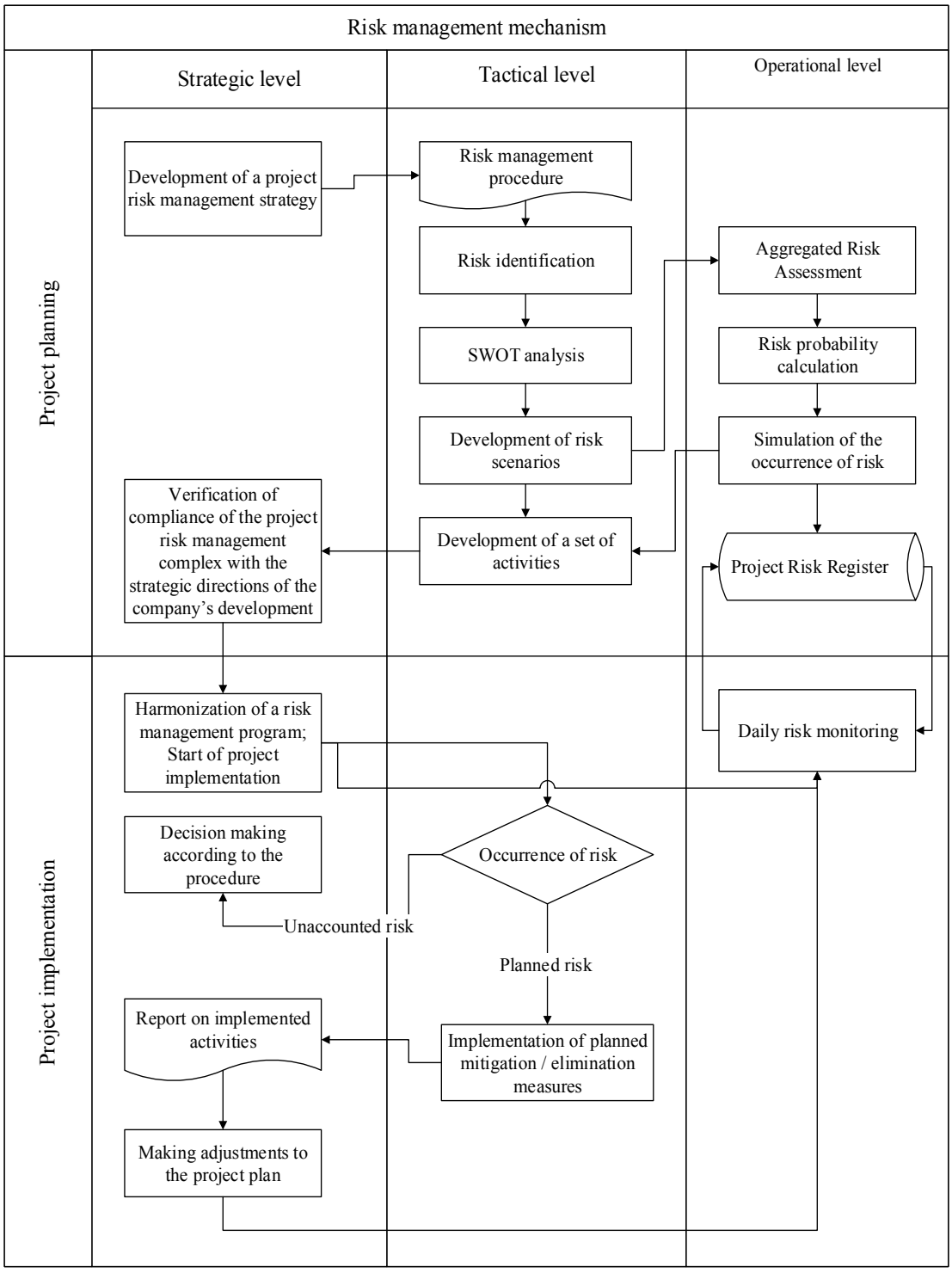

Figure 02. Innovation project risk management algorithm

Thus, the basic principles of risk management of an innovative project can be formalized in the proposed management algorithm. Traditionally, the risk management process is a linear process, the practical implementation of a three-level mechanism will allow a comprehensive approach to the issues of risk management, taking into account the interests of each participant in the innovation project.

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7. Conclusion

The proposed principles of innovative project management are aimed at reducing the likelihood of risks and represent: the principle of strategic unity of goals and objectives in the field of project management and project risks; principle of identification of project risks; the principle of reducing the likelihood of risks; the principle of constructing a risk management algorithm for innovative projects. The proposed risk management algorithm provides a systematic and most comprehensive approach to the coordination of project risk management, taking into account the strategic goals of the organization, as well as taking into account aspects of project activities at three levels. The practical implementation of the method has the following advantages:

- modern information and technology tools allow complex procedures for identifying risks, building scenarios, the use of simulation methods (for example, the Monte Carlo method) will identify possible risks and assess the state of the system when risks arise; monitoring of the occurrence of risks will allow on a daily basis to take into account the occurrence of uncertainty conditions and assess the degree of influence of risk on the project;
- the proposed method for assessing the risks that arise during the implementation of an innovative project can be implemented in the corporate enterprise management system and project management system for integrating corporate information, providing an objective approach to risk management.

Since the main cause of risk is uncertainty, which can lead to positive or negative results, research in the field of approaches to risk assessment can significantly expand the existing structure for managing innovative projects.

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