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## **RISK MANAGEMENT OF THE DEVELOPMENT OF COMPLEX SOFTWARE PRODUCTS USING THE GARTNER METHODOLOGY**

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**Abstract.** *In a market economy, risk is an integral attribute of business. Uncertainty makes it impossible to avoid risk. But this does not mean that you should look for such solutions, where the result is known in advance, they are, as a rule, ineffective. It is necessary to learn to anticipate risk, assess its dimensions, plan measures to prevent it and not exceed permissible limits. Planning and implementation of projects takes place in conditions of uncertainty, which is generated by changes in the internal and external environment. The methods of working with risks inherent in the subject area of complex software development were analyzed, a concept model of the risk identification process was built, the principles of risk management were formulated, and the Gartner research method was applied.*

Risk management in software development is the process of measuring or assessing risk in software development and then developing a risk management strategy (Risk Management). The main goal of the risk management process is to change the pattern of behavior. Instead of reacting to risks that have already occurred, it is necessary to prevent risks and develop an action scenario in the event of a risky event.

Due to the fact that activities in the IT industry are closely related to innovative activities, risks in this field of activity have a high probability and a significant degree of impact on projects.

Risk management in the process of project management is defined as a set of measures, including the identification, analysis of risks and decision-making aimed at reducing the probability and degree of their impact on the progress, results and products of these projects.

The classification of project risks is usually carried out at the stage of their analysis according to such criteria as the probability of occurrence and the degree of influence within the framework of the project. But it is quite expedient to create an initial risk classification of IT projects, which will serve as input information for the process of their identification [1]. In this direction, a lot of analytical work has already been carried out by domestic and foreign specialists. There is quite a lot in common among all published risk classification options both in general and in the IT industry in particular. First of all, it is customary to divide all risks by source into internal and external. Internal risks depend directly on the project's internal environment and have a relatively high level of control. External risks arise regardless of project activities, can be taken into account by project participants and be partially managed. External risks can be qualitatively divided into two subgroups - predictable and unpredictable.

According to the classification of software development risks by the nature of the consequences, risks can be divided into two groups - pure and speculative. The peculiarity of pure risks is that they, as a rule, carry only losses for entrepreneurial activity, while commercial or speculative risks carry either losses or additional profit. Risks arising during the development of software can be classified as pure and speculative.

Therefore, the operational management of an IT project, in particular its risks, which is understood as a multiple solution to the problem of choosing the optimal management, taking into account all the available information, makes it possible to increase the efficiency of project management, especially in conditions of uncertainty.

Risk assessment can be performed with varying degrees of depth and detail using one or more methods of varying levels of complexity and purpose. The assessment form and its output data must be compatible with the risk criteria established when defining the scope of application. The choice of methods that will provide a complete and optimal risk register for a specific process, activity or project is a reliable foundation for the stage of risk identification.

The following methods are used to identify risks [2]:

- Brain storm
- The Delphi method
- Method of nominal groups
- Crawford cards
- Survey of experts
- Analysis of strengths and weaknesses, opportunities and threats (SWOT analysis)
- Analysis of checklists
- Method of analogy
- Methods using diagrams

Gartner's methodology [3] is based on an analysis of the activities of 12,000 individual enterprises, both suppliers and users, and provides clients with a picture of supply and demand that they can only get from Gartner. As a result, clients use Gartner's forecasts as validations of their own internal forecasts in the telecommunications, IT services, software, devices, data processing and semiconductor industries. The Gartner methodology allows:

- Understand potential market opportunities
- Identify changing market conditions, their impact on the market and related assumptions
- Evaluate, formulate and test business plans

Gartner's "Market Forecast" is based on a market model specific to the dynamics of a particular market segment and identifies the main factors that influence what assumptions are made. These assumptions are informed by multiple facts, such as primary and secondary research, question analysis, and an extensive network of industry contacts. Gartner's standard forecasts include two years of historical data and five years of future forecasts, providing a comprehensive view of supply and demand across markets, geographies and industry verticals on a quarterly basis.

Market forecasts include supporting analysis that explains how Gartner predicts the reproduction of market trends in both primary and adjacent markets and related assumptions that Gartner believes have a major impact on the forecast.

## **REFERENCES**

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[3] Gartner. Enterprise Resource Planning (ERP) [electronic resource]. – Access mode: <https://www.gartner.com/it-glossary/enterprise-resource-planning-erp/>