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## **CLASSIFICATION OF METHODS FOR ANALYSIS AND EVALUATION OF INNOVATIVE ACTIVITIES**

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**Abstract.** The classification of methods of analysis and assessment of the innovation environment is considered according to a number of criteria. The criteria of the proposed classification outlined by the author allow to streamline the existing methods of analysis and assessment of the innovation environment, taking into account the specific goals of management and the corresponding controlling tools.

**Keywords:** innovation, assessment procedure, assessment environment, controlling, target indicators.

Methods for analyzing and assessing the innovation environment are key tools used in the assessment procedures in the field of innovation. The final result depends on the accuracy of the calculations within the framework of the correctly chosen method of analysis and assessment by the subject: the further implementation of the innovation project (within a certain stage) or their termination.

Analysis of foreign and domestic literature in the field of methodology for analysis and assessment of innovations indicates the presence of a number of problems within the framework of existing classifications:

- lack of a unified approach to the classification of methods of analysis and assessment of innovation;
- the presence of disparate classifications of methods of analysis and assessment of innovation;
- lack of grouping according to a certain set of criteria;

- the presence of contradictions between the classification features of methods of analysis and assessment of innovation.

When analyzing the scientific base, the classification of methods of analysis and evaluation of concepts such as "innovation potential", "innovation", "project", "risk", etc. was also used. These terms are most consistent with the characteristics, requirements and principles of analysis and evaluation of innovation associated with the main limitations of the study of innovation, such as risks, uncertainties, etc.

Taking into account the presence of a sufficiently large number of disparate methods that can be applied when carrying out assessment procedures in the field of innovation, it is necessary to select a group of criteria within the framework of the chosen approach. The presence of different criteria, taking into account the correctly chosen approach, makes it possible to streamline the existing methods when conducting assessment procedures in the field of innovation, which will entail transparency, structuredness and an increase in the practical significance of the proposed classification.

Thus, the lack of clearly defined criteria in the formation of the classification of methods of analysis and assessment of the innovation environment contributed to the development of the classification of methods of analysis and assessment of the innovation environment by groups of criteria based on the target approach ("goal-tool (method)"), which is presented in Table. 1.

**Table 1. Classification of methods of analysis and assessment of the innovation environment**

№	Criteria of classification	Methods for analysis and assessment of the innovation environment (controlling tools)
1	2	3
1	Analysis and evaluation by target indicators	Investment methods of analysis and assessment Financial methods of analysis and evaluation Expert methods of analysis and evaluation Cognitive methods of analysis and evaluation Morphological methods of analysis and evaluation Foresight methods of analysis and evaluation
2	Analysis and assessment by the level of formalization	Qualitative methods of analysis and evaluation Quantitative methods of analysis and evaluation
3	Analysis and assessment of the level of certainty	Probabilistic (non-deterministic) methods of analysis and evaluation Non-stochastic (deterministic) methods of analysis and evaluation Linguistic methods of analysis and evaluation
4	Analysis and assessment of the level of dynamism	Dynamic methods of analysis and evaluation Static methods of analysis and evaluation, etc.

So, the use of such a classification criterion as "analysis and assessment by target indicators" allows you to highlight:

1. Investment methods for analyzing and evaluating the innovation environment (used as part of the procedure for analyzing and evaluating innovation activities, when the purpose of the study is to conduct an investment assessment of the effectiveness of a strategy, portfolio, innovation projects).

2. Financial methods of analysis and assessment of the innovation environment (used as part of the procedure for the analysis and assessment of innovation activities, when the purpose of the study is to determine the financial and budgetary efficiency in the field of innovation at various levels of management, to determine the cost of innovation in the future, to determine the impact of innovation on capitalization enterprises).

3. Expert methods for analyzing and assessing the innovation environment (used as part of the procedure for analyzing and assessing innovations, when the purpose of the study is to obtain information from experts with a certain amount of experience and knowledge on a specific innovative project within the posed problematic issue, when it is impossible for the subjects of analysis and assessment determine the integral indicator between qualitative and quantitative indicators).

4. Morphological methods of analysis and assessment of the innovation environment (used as part of the procedure for the analysis and assessment of innovative activity, when the purpose of the study is to determine performance indicators based on the determination of the main indicators within the limit, which involves a choice of the maximum number of system elements based on the principles of combinatorics).

5. Cognitive methods of analysis and assessment of the innovation environment (used as part of the procedure for the analysis and assessment of innovation activities, when the purpose of the study is to study complex, semi-structured systems, to operate both qualitative and quantitative information when analyzing and evaluating in the field of innovation, etc. etc.).

6. Foresight methods for analyzing and assessing the innovation environment (used as part of the procedure for analyzing and evaluating innovation activities, when the purpose of the study is to correlate innovations with long-term trends in the future and coordinate them based on targeted decision-making, determine the level of strategic and critical importance in the field innovation activity, etc.).

A description of the conformity "the goal of management is a controlling tool" when carrying out assessment procedures in the field of innovation is presented in Table. 2.

The proposed classification of methods for analysis and assessment of the innovation environment, incl. innovations, taking into account the target indicators are presented in Table. 3 and includes the names of the main groups and subgroups of methods, as well as their distinctive features.

**Table 2. Compliance of management objectives with controlling tools when carrying out assessment procedures in the field of innovation**

№	The purpose of management	Controlling tool
1	Determination of investment attractiveness and profitability of innovative activities, calculation of payback periods, determination of indicators in dynamics, taking into account the time factor, etc.	Investment methods of analysis and assessment
2	Determining the financial attractiveness of innovations, determining the level of income and expenses in the framework of the implementation of innovations, determining the level of influence of the implementation of innovative activities on the value of the enterprise and capitalization, determining forecast estimates and forecasting the cost of innovations in the future, etc.	Financial methods of analysis and evaluation
3	Determination of the level of risks of innovation activity, calculation of target indicators of various types of efficiency, mathematization of qualitative information and its correlation with quantitative characteristics, assessment of the compliance of key target indicators with the goals of innovation activity, etc.	Expert methods of analysis and evaluation
4	Generation of alternative solutions, choosing from an alternative list of ideas the best option for implementing innovative activities (performance indicators, selection criteria, strategies, implementation directions, innovation risk levels), etc.	Morphological methods of analysis and assessment
5	Analysis and assessment of complex, rapidly changing and semi-structured systems and tasks, building links of the influence of elements of innovation, correlating qualitative and quantitative information in the framework of calculating target performance indicators in the field of innovation, substantiating selection criteria, identifying innovation risks, etc.	Cognitive methods of analysis and assessment
6	Determination of the level of strategic development and innovation, assessment of compliance with trends and standards of innovation, analysis of the internal and external environment, assessment and analysis of competitors, determination of the level of criticality of innovation, etc.	Foresight methods of analysis and assessment

**Table 3. Methods for analyzing and evaluating innovative activities aimed at taking into account the specifics of target indicators**

№	Name of the group (subgroup) of methods	Distinctive features
1	Investment methods of analysis and assessment	Investment methods for analyzing and evaluating innovation activities are inherently focused on assessing the economic efficiency of investments in the field of innovation, taking into account and without taking into account the time factor of changes in the cost of funds. Investment methods are based on forecasting cash flows and inflows, capital investments, the level of profitability of innovation, etc. This group of methods is distinguished by a high level of accessibility for users and is the most used in the analysis and assessment of innovation in modern conditions
1.1	Investment methods of analysis and valuation without discounting	The methods are based on the calculation of indicators based on the investment analysis of innovation activities on the assumption of equal importance of income and expenses in investment activities, not taking into account the time value of money
1.2	Discounted investment methods of analysis and valuation	The methods are based on the calculation of indicators based on the investment analysis of innovation activities on the prevention of equal importance of income and expenses in investment activities and accounting for the value of money over time
2	Financial methods of analysis and evaluation	Financial methods of analysis and assessment of innovation activities are based on the determination of financial efficiency and include the calculation of indicators of profitability, profitability of innovation, the level of margin, include analysis of the cost of innovation, determination of the value of the underlying asset after a period of time, depending on the changing conditions of the external and internal environment, form groups indicators and conduct causal relationships between them
2.1	Methods of analysis and evaluation of financial indicators	Methods for analyzing and evaluating financial indicators make it possible to determine the main values of the financial efficiency of innovative activity based on calculating the cost of implementation, determining the predicted profit of innovative activity, and other indicators. The group of methods is closely related and based on information coming in the framework of accounting / management accounting, statistical information and planned values
2.2	Valuation methods for real options	The methods of real options in the analysis and assessment of innovative activities are strategic in nature and are the equivalent of the development of an enterprise in its dynamics. This subset of methods helps to determine the impact of innovation on increasing the value of the company, as well as its cost on the long-term planning horizon. Real option methods clearly respond to the risk and uncertainty factors that accompany innovation. In conditions of clear determinism, the methods of real options lose their meaning. The essence of the methods of real options in the analysis and assessment of innovation activity is the analysis of managerial flexibility, which entails an assessment over time
2.3	BSC - methods	BSC -methods are a system for analyzing and evaluating innovative activities based on a system of indicators in several areas that have clear interrelationships focused on the strategy of the enterprise. This subgroup of methods allows you to translate the vision and strategy of the enterprise into specific tasks and indicators based on an integrated approach
3	Expert methods of analysis and evaluation	Expert methods of analysis and assessment of innovation activity are a complex of logical, mathematical procedures based on the opinions of experts. The essence of the methods lies in the rational examination of a problematic issue, followed by a quantitative / qualitative assessment

		and subsequent processing of the results. The final generalized opinion of experts is accepted as a solution to the problem. This group of methods is distinguished by the subjectivity of judgment due to the use of expert opinions on problematic issues. Analysis and evaluation of innovation activity using expert methods should include a clear algorithm for the selection of experts
4	Morphological methods of analysis and evaluation	Morphological methods of analysis and assessment of innovative activity are based on the search for the maximum number within the variability of solutions to a problem or the implementation of a system by combining the main elements of the system and their features. Morphological methods of analysis and assessment of innovative activity are based on the element-wise decomposition of the problem, as well as the search for the optimal solution for the entire problem. Morphological methods of analysis and evaluation presuppose, in essence, not a simple decomposition (decomposition of the whole into its constituent parts with the allocation of elements according to the principles of functional significance and role), but a direct or indirect connection with the external environment
5	Cognitive methods of analysis and evaluation	Cognitive methods of analysis and assessment of innovative activity are based on the laws of the processes of perception, cognition, understanding, transformation, representation, thinking, reflection, learning and modeling principles of the organization and operation of natural and artificial intelligent systems. Cognitive methods are a synthetic group of different kinds of methods, united by a single problematic and similar methodological principles. The basis of cognitive methods is made up of neurophysiology, anthropology, problems of artificial intelligence, decision theory, computer science, linguistics, epistemology, logic and psychology.
6	Foresight methods of analysis and evaluation	Foresight methods are inherently focused on solving the strategic goals and priorities of the company in the field of analysis and assessment of innovation and allow to highlight the priorities of innovation. This group of methods makes it possible to determine in advance the mainstreams of the development of innovations in a certain area, and then, on their basis, to analyze and evaluate newly created innovations. Foresight methods are directed towards the future and allow you to analyze projects taking into account the directions of scientific and technical development of an enterprise, region, country, world trends

The considered methods illustrate only the general directions of quantitative and qualitative analysis and assessment in the field of innovation, since in many cases it is very difficult to determine both the probabilities of obtaining possible results and their quantitative assessment. In such cases, specific methods of analysis and evaluation should be used.

In general, the proposed classification of methods of analysis and assessment of the innovation environment:

- allows you to systematize numerous methods of analysis and assessment of the innovation environment;
- focused on achieving the strategic, tactical and operational goals of the enterprise in the field of innovation, depending on the goals of management;
- allows to increase the level of transparency and objectivity of assessment procedures in the field of innovation by delegating service management functions to controlling in these matters;
- is aimed at obtaining more accurate and prompt results of evaluation procedures in the field of innovation due to pre-formed controlling tools when carrying out procedures (the principle of "goal-tool");
- increases the level of formalization and certainty of procedures for analyzing and evaluating innovative activities, etc.