

Fundamentals of Integrated Management: Analysis of Innovation

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INTRODUCTION

As we can see from the experience of developed countries, a high level of economic development is ensured by a number of conditions, the accumulated scientific, technical, industrial and investment potential, institutional factors of the technical progress and state support of innovative transformations being the main ones.

The contemporary market economy has no alternative but to go down an innovation development path, which boosts the need for research into the theory, methodology and methods of the innovation component of management analysis. This, in turn, makes it possible to take adequate and effective decisions as regards innovation management by an economic agent (organization, enterprise, firm, company).

The innovation development concept is gradually turning into a center of attraction for most natural and technical branches of science and humanities. Economics plays a special role in the study of the multi-faced influence of innovations on various sides of life in contemporary society. The present need to speed up the transition of a particular country to an innovation-driven economy calls for the intensification of research into the problems of innovative development that ensures the formation and strengthening of competitive advantages for each economic entity in the contemporary transformational world, which, in its turn, is one of the key tasks of ensuring its survival and prosperity. The level and effectiveness of innovation that the economic entity has achieved largely determines the effectiveness of addressing this task. Competition pushes economic entities to ensure an economic safety margin both via a more reasonable use of production and financial resources and by attracting investors for the upgrade or expansion of business. This is preceded by innovation activities aimed at developing capital investment options designed to reveal and support competitive advantages. Such advantages mean fewer risks, higher return on investment compared to rivals in a specific market niche. The market niche may mean a particular kind of activity aimed at creating consumer values, or a geographic area, but in any case potential business propositions require a relevant innovation substantiation based on a clear information database and convincing analytical calculations.

The importance of the issues mentioned above calls for improvement of analytical support of the management decision-making process as regards innovation (in its broad sense, that is, including investment and marketing), which, in the authors' opinion, is the most important part of an organization's economic activities under the current conditions.

In view of the above-mentioned, the authors suggest using integrated management analysis of innovation that they have designed as a tool of building analytical support of innovation management.

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METHODOLOGY

The methodological framework of the research the results of which are presented in this article is based on the following elements:

1. A conceptual approach to the integration of processes that make up the organization's innovation activity.
2. The conceptual foundations of business-specific kinds of management analysis used for the study of innovation.
3. The concept of the Balanced Scorecard (its innovation component)

Let us take a brief look at each of them.

Under the current conditions, innovation activity is seen as a process that ensures market success thanks to the transformation of the results of scientific and technical achievements and research into new or improved kinds of goods (works, services) and technologies. What is positive about this approach is that it implicitly reflects the process of the creation of innovations and implies that companies that generate innovations may use them. However, the idea that improved products and technologies can be considered an innovation is disputable.

Innovation is more effective if it is implemented as the main kind of activity by specialized organizations engaged in the development of new products for sale in the innovation market. However, in practice, a wide range of non-specialized organizations tend to develop new technologies for the production of standard goods using insourcing.

We define innovation is the process of finding and using scientific and technical achievements with the help of R&D efforts which make it possible to create and introduce innovations that result in certain effects inside the company and/or in the domestic and/or foreign market.

Speaking about the place and the role of innovation in the contemporary market economy, the assessment of integrative processes in the field of innovation acquires critical importance. The problem is that innovation yields the maximum effect if it is closely integrated with investment, the setting up of new production facilities, design and financing. If so, it not only reduces the general innovation cycle but also triggers a synergistic effect, i.e., an additional effect caused by close partnership interaction of all parties involved in a single technological conveyor.

It is noteworthy that in the first formative years of innovation its stages were not normally separated from each other and were usually implemented within the same organization: a company independently designed a new product, improved the product until it could go into batch production, acquired (or made) necessary equipment, expanded production facilities, found financial resources for carrying out works at all the stages mentioned above. At the early stages of industrial development such kind of universalization increased the effectiveness of innovation complex management and helped relatively reduce the execution period of interrelated works.

However, an insufficient level of functional specialization that is typical of such organizational-technological scheme reduced the quality of some works and their overall efficiency, so in the course of time differentiation of innovation took place. At present, the following kinds of works are distinguished in innovation, which are, as a rule, implemented by organizations specializing in the following trades: science and technology, innovation, innovation and investment engineering, financial intermediary, organization and coordination of innovation project implementation.

Some time ago, specialization gave a powerful impetus to further growth of effectiveness in the field of innovation as there emerged favourable conditions for the growth of employees' competence and improvement of the quality of implementation of each kind of works. That ensured general progress in this sphere for a while.

But now that overall transition of industrially developed countries to a knowledge-based economy has begun, highly specialized execution of certain kinds of innovation works no longer complies with present-day requirements, not to mention the requirements of the near future. It does not offer an adequate response to the high pace of change and impedes the achievement of really significant and stable social-economic and scientific and technical results.

It appears that the development of science and innovation calls for joining the efforts of scientists, those developing innovations, designers, investors, developers and builders in the course of implementation of the so-called integrated innovation activity. In other words, the present-day situation requires a fundamentally different interaction pattern for all participants to the single technological conveyor, and the development of integration processes in innovation should be encouraged in every possible way.

Consequently, effective innovation management is only possible if this activity is regarded as a single complex. As a result, all economic functions of management (accounting, analysis, planning, etc.) also become of integrative nature.

It is natural that the biggest synergistic effect is achieved in an integrated system where the entire complex of processes of development, creation and use of innovation objects of capital investment is implemented in the form of a single innovation project.

Effective management of such a project calls for the development and application of methods, procedures and indicators of management analysis, which, in turn, requires that its place under the conditions of the contemporary market economy be identified.

Another distinguishing feature of contemporary management analysis is its influence on the process of accounting with the purpose of obtaining relevant analytical information.

A broader interpretation of the notion "management accounting" by Ch. Horngren and J. Foster (Horngren & Foster, 1995) may be of interest to researchers: it includes identification, measurement, collection, systematization, analysis, decomposition, interpretation and handing over of information necessary for a management system. In this case management analysis is understood as a component of management accounting.

Some authors, for example, C. Drury (Drury, 2005), imply that management analysis is part of management accounting and refer to the definition of the latter as a system of provision of relevant information for managers to make more substantiated management decisions inside a particular economic agent in order to boost performance of current operations and effectiveness of its activity in general.

The contemporary theory and practice of management analysis have various approaches to its classification (Bakanov, Melnik & Sheremet, 2005; Kovalev, 2007; Savitskaya, 2011).

Moreover, by the term "classification" some understand not an elaborate scheme that distinguishes 10 business-specific kinds of analysis (Ilyshev & Karavayeva, 2007), but a way of distinguishing relevant kinds of management analysis based on object-functional characteristics aiming to use the opportunities of their integral inclusion for a synergistic effect. As a result, one can single out any required number of the types of analysis which makes it possible to use a new approach to economic processes based on the integration of techniques from different kinds of analysis.

For a better understanding of specific features of the proposed classification we consider it useful to define in reasonable detail the following characteristics of each business-specific kind of organiza-

tion management analysis (Table 1): object of analysis, subject of analysis, goal of analysis, and main information sources.

Table 1. Business-specific kinds of management analysis of an organization and its main characteristics

Characteristics of analysis			
Object	Subject	Goal	Sources of information
1. Intracompany management analysis (analysis of production costs)			
All kinds of production costs	Production and economic activities	Assessment, diagnostics and forecast of resources, costs and results of production activities	Accounting data
2. Investment management analysis			
Investment	Investment activity processes	Assessment, diagnostics and forecast of resources, costs and results of investment activity	Accounting data
3. Innovation management analysis			
Innovation	Innovation processes	Assessment, diagnostics and forecast of basic elements of innovation activity	Statistical and accounting data, sociological information
4. Logistic management analysis			
Logistics	Logistic processes	Assessment and diagnostics of resources, costs and results of logistic activity	Accounting data
5. Management analysis of organizational and technical level			
Material and technical resources	Processes of renewal of material and technical resources	Assessment and diagnostics of costs and results of material and technical resources development	Accounting data
6. Management analysis of social and labour relations			
Social and labor relations	State of social and labor relations	Assessment and diagnostics of state and development of social and labor relations	Statistical and accounting data and sociological information
7. Management analysis of economic potential			
Economic potential	State and development of economic potential	Assessment, diagnostics and forecasting of state and development of potential	Accounting data
8. Marketing management analysis			
Marketing	Marketing processes	Assessment, diagnostics and forecast of resources, costs and results of marketing activity	Marketing research data
9. Competitive management analysis			
Competition	Competitive advantages, personal characteristics of competitors	Assessment, diagnostics and forecast of competitive positions	Competitive intelligence data, accounting data
10. Strategic management analysis			
Strategy of organization development	Processes of long-term development	Assessment and diagnostics of strategy, monitoring and making changes	All kinds of accounting data

With this in mind, the proposed goal-setting includes such steps as assessment, diagnostics and forecast of indicators characterizing resources, costs and results of the corresponding kind of the company's business. The assessment of indicators under study envisages the juxtaposition of their factual

and baseline values (targets, values of prior period), identification of the deviation of actual values from baseline values and qualitative assessment of those deviations. The diagnostics of the deviations of the indicators under study reveals factors that brought them about while relevant techniques of factor analysis help determine the effect of each of them. In the course of forecasting indicators under study multiple options are offered based on relevant forecasting methods depending on expected changes in internal and external conditions of the company's operation. It is obvious that assessment, diagnostics and forecasting are closely interrelated as each subsequent action is based on the preceding one. For example, diagnostics is carried out on the basis of indicators' assessment while forecast takes the results of diagnostics into account.

At the same time, one should keep it in mind that a certain part of organizational and methodical issues is common for all business-specific kinds of management analysis. The other part of the issues under study turns out to be specific and reflects both the peculiarities of each business-specific kind of management analysis subject to integration and the peculiarities of the integration procedures as well.

The issues of methodology of management analysis most commonly include the principles and methods of organization of the theory and practice of an industry. The methods and techniques of conducting various analytical procedures include methods of collecting primary information (direct observation, documentary methods, techniques and procedures of collective expert assessment, etc.) as well as various techniques of information processing (information pattern organization, scaling, interpretation and techniques of statistical analysis).

The Balanced Scorecard Concept as an instrument applied in the field of strategic management was developed by American scientists R. Kaplan and D. Norton in the early 1990s (Kaplan & Norton, 1992). The concept evolved both in their works (Kaplan & Norton, 1996, 2001, 2003, 2008) and in the works of a number of other foreign economists (Brown, 2007; Friedag, & Schmidt, 2002; Horvath & Partners, 2004; Maisel, 1992; Olve, Roy & Wetter, 2000; Rampersad, 2003). The concept has proven its practical viability.

Furthermore, the idea is gaining ground that the Balanced Scorecard is an important instrument of the strategic management system of an economic agent (organization, enterprise, firm, company) which, in fact, shapes its information support within the frames of strategic management accounting.

Generally speaking, the Balanced Scorecard can be characterized as a system of parameters describing the overall performance of an organization in the contemporary market economy.

The name of the system- the Balanced Scorecard- reflects the balance maintained between short-term and long-term goals, financial and non-financial indicators, basic and auxiliary parameters, as well as internal and external factors of business operation.

The main goal of the Balanced Scorecard is to transform the company's strategy into specific tangible objectives, indicators and eventually, actions (measures).

The Balanced Scorecard system is based on cause and effect, factors of achievement and interrelation with financial indicators.

The Balanced Scorecard comprises four basic interrelated elements: financial and customer perspectives, components relating to internal business processes and those dealing with training and development of personnel. The components are represented through the prism of key problems, strategic objectives, indicators and their target values as well as strategic measures. In addition, the internal business processes component consists of three more elements: innovation, operational and after-sale service.

The BSC metrics make it possible to characterize comprehensively the performance of both commercial, government and non-profit organizations. The metrics are relatively few in number (about 25 scores on average) and they are formed on the basis of the outlook and strategic goals of any particular

organization, which means they have individual features. They represent a balance between external accounting data for owners (stakeholders) and clients and internal characteristics of the most significant business processes, innovations, training and growth. This is the balance between the results of the organization’s previous performance and future growth. The system is a combination of objective, easy-to quantify results and subjective, somewhat arbitrary parameters of future growth.

In other words, when describing the strategy of an organization, the BSC acts as a mechanism of this strategy implementation rather than a mechanism of its definition. The Balanced Scorecard is not only a tactical or operational assessment system. It does not replace the routine parameter assessment system. The BSC metrics are selected in such a way as to make the organization managers and employees focus on the factors that will lead to major achievements in the organization’s ability to compete. At the same time, the BSC should be available as an information source to the organization employees of all levels. The ‘front-end’ employees should be aware of the financial consequences of their decisions and actions, and top managers must be fully aware of what will take the company to long-term financial success.

For innovation companies the BSC serves as a means of long-term strategic management while its assessment component is used to solve the key tasks of the management process.

The innovation component of the Balanced Scorecard innovation that has been developed can be presented as a table (Table 2).

Table 2. Balanced Scorecard innovation component

Key problem of Balanced Scorecard innovation component	Strategic goal of innovation process	Innovation process indicator	Target value	Strategic innovation event
What goals concerning the innovation process must be set in order to ensure the achievement of goals of operational process, after-sale service and customer and financial goals?				

Just like any other BSC metric, the indicators of its innovation component always have individual features of any particular organization and are determined by the organization’s innovation strategy. Nevertheless, for the sake of illustration we will highlight several common metrics of the innovation process that measure its strategic goals and are largely universal for all kinds of organizations (Table 3).

In addition, as the author of this article showed in his previous publications, the metrics of the BSC innovation component may be used as an information database for strategic innovation analysis in any company which uses the Balanced Scorecard (Krylov, 2014a). Such analysis constitutes a part of strategic management analysis and consists of assessment, diagnostics and forecasting of values of the given metrics (Krylov, 2013, 2014b).

Having determined that the development of integration processes in innovation is possible, necessary and viable and having revealed an objective need for potential integration of analysis of this activity with some of the most important kinds of management analysis, including strategic management analysis, we shall proceed to the conceptual basics of a fundamentally new kind of management analysis: integrated management analysis of innovation.

Table 3. Some common metrics of BSC innovation component

Strategic goal of innovation process	Metric
Reveal clients' needs that are acceptable for the company in terms of the production of new goods and services which will be of great value for clients in the future.	Clients' preferences, acceptable for the company that have to do with the possibility of production of new goods and services; Ranking of each type of clients' preferences acceptable for the company, relating to the possibility of production of new kinds of goods and services; Estimated volume of the market for new goods and services to be produced; Tentative prices for new kinds of goods and services to be produced
Use innovations to create goods and services to propose to clients that will enable the company to stay ahead of competitors	Number of working variants of fundamentally new kinds of goods or services developed before it was released into the market; Duration of the development of fundamentally new kinds of goods and services; Degree of fulfilment of clients' wishes concerning fundamentally new kinds of goods and services
Conduct profound research on fundamentally new kinds of goods and services creating customer value	Number of fundamentally new kinds of goods and services; Share of fundamentally new kinds of goods and services in total sales; Launch of a new kind of goods set against a planned or rival product
Conduct in-depth research on opportunities of the use of already existing technological processes for the production of goods and services of the next generation	Capacity of production process; Number of kinds of goods and services of the next generation that can be produced using already existing technological processes
Goal-oriented development of new kinds of goods and services for promotion in the market	Pace of promotion of new kinds of goods and services to the market; Share of new kinds of goods and services which met clients' requirements at the first try; Losses from sales of new kinds of goods and services that came to the market later due to correction of drawbacks of the initial project; Break-even time

RESULTS

When characterizing the most important organizational and methodological issues relating to a fundamentally new kind of management analysis – integrated management analysis of innovation – one should keep it in mind that this kind of analysis is aimed at uniting innovation management analysis and investment management analysis in the first place. It is therefore reasonable to link the result of this integration, that is, innovation and investment management analysis, to competitive management analysis and marketing management analysis.

In our opinion, programme and methodological questions relating to integrated management analysis of innovation activity should be considered in the following strict sequence: identify the object and subject → identify goals and principles of analysis → develop a system of indicators → select information sources → select methods of analysis → determine areas of application of the results.

Identification of Object and Subject of Integrated Management Analysis of Innovation Activity

When identifying the object and subject of integrated management analysis of innovation (the first programme-methodological question) we propose the following definitions.

The object of integrated management analysis of innovation is the innovation activity (in a broad meaning of the word, that is, including investment) of companies which have switched to an innovation path of development or which are in the process of such transition. In such companies, innovation and investment activities are in the process of integration which has an irreversible nature. Therefore, con-

ducting innovation management analysis separately from investment management analysis with further integration of their results looks extremely unreasonable.

The subject of integrated management analysis of innovation is a complex of processes of formation of relevant resources, costs incurred and results obtained in the course of the activity under study. The results obtained, the costs and effectiveness of resources use are largely determined by:

- how the scale and structure of innovation corresponds to the current and, in particular, prospective needs of the market of innovation products and technologies,
- second, by the competitive advantage of innovation (as compared to competitors' activity).

In the light of the abovementioned, the subject of integrated management analysis of innovation should also include the most important processes happening in the consumer market and in the company's competitive environment.

The section titled "Methodology" provides a more detailed description of the contents, place and role of the innovation activity under present-day conditions which makes it possible to better understand the specifics of the object and subject of integrated management analysis of this activity and its features.

Identification of Goals and Principles of Integrated Management Analysis of Innovation

It is reasonable to start the identification of goals and methodological principles of integrated management analysis of innovation (the second programme-methodological question) with the identification of the main goal and more local goals it consists of.

In the course of companies' transition to an innovation economy the main goal of integrated management analysis of innovation is to provide their management and owners with complete, accurate and quality information about effectiveness of the company's innovation-driven performance, untapped resources and opportunities for their mobilization.

The main goal of integrated management analysis of innovation consists of local goals (subgoals) connected with relevant kinds of management analysis. These subgoals may be defined as follows:

- for innovation management analysis: revealing the scientific and technical level, progressivity rate and commercial demand for innovations as well as the innovation activity and how the innovation activity is encouraged in the company;
- for investment management analysis: assessing if the company has enough investment resources, financial support of the innovation activity from budgets of all levels, domestic and foreign capital and finding out the effectiveness of investments in innovations;
- for competitive management analysis: assessing competitive advantage, intensity of innovation creation, innovation saturation of the company, its technological dependence, duration of the innovation completion cycle and copyright protection of innovations;
- for marketing management analysis: assessing the integrity of the development of product innovations, use of the latest and emerging technologies, demand for process innovations and universal approach to the use of innovation processes.

By carefully adhering to the system of local subgoals makes it possible to implement the main goal of integrated management analysis of innovation.

For the purpose of increasing the scientific level of integrated management analysis of innovation it is essential to determine the principles of its application in the course of carrying out analytical procedures. It is common practice to distinguish general principles which are typical of virtually any kind of economic analysis, and specific principles, which are peculiar to both integrated management analysis and integrated management analysis of innovation activity.

General principles of economic analysis (they are often referred to as requirements as well) usually envisage the following characteristics: objectivity, statesmanship, efficiency, regularity, effectiveness, specific, cost-effectiveness, comparability, comprehensive nature, timeliness, goal-oriented, prompt, accuracy, consistency, substance, scientific character and validity of conclusions (Bakanov, Melnik & Sheremet, 2005; Kovalev, 2007; Savitskaya, 2011).

However, the authors believe that it is rather difficult to follow all the 17 principles at once.

It appears that the abundance of the general principles tends to mislead analysts rather than helps them find their bearings among up-to-date requirements to analytical procedures.

First, principles of objectivity, accuracy and substance are quite similar and can be pulled together to form one.

Second, the principles of efficiency, effectiveness and cost-effectiveness also tend to echo each other in a way.

Third, the requirement of “being careful” when conducting analysis comes into conflict with other requirements (those of objectivity, scientific character, etc.) and, in the authors’ view, is just wrong.

Specific principles of integrated management analysis include:

1. Principle of integrity of intracompany analysis and environmental analysis.
2. Principle of “equality” of all business-specific kinds of management analysis.

Principle of Integrity of Intracompany Analysis and Environmental Analysis

When we briefly looked at the contemporary state of management analysis (section titled “Methodology”) we showed that management analysis has an integrated character. Therefore, it would be right to assume it to be a combination of a wide range of local kinds of intracompany analysis and analysis of the environment (close and distant), that is it possesses integrity.

The integrity of internal and external analysis can be explained by at least three circumstances:

- 1) one cannot speed up the transition to an innovation path of development only on the basis of the results obtained with the help of various kinds of intracompany analysis (analysis of production costs, analysis of company economic potential and analysis of organizational and technical level);
- 2) one cannot seriously count on a positive result by relying only on the opportunities provided by environmental analysis (marketing and competitive);
- 3) the integrity of internal and external analysis is enhanced by the fact that three quite important local kinds of management analysis (investment, logistic and analysis of social and labour relations) possess a complex, combined character, and ensure strong connection between purely internal and external kinds of analysis.

Principle Of “Equality” Of All Local Kinds of Management Analysis

When applied to integrated management analysis, “equality” means that in general all the ten local kinds of analysis presented earlier (in the section titled “Methodological Framework of the Research”) originally possess equal representation in the completely integrated analysis.

At the same time, it does not mean that the principle of equality is unshakable when conducting the analysis. The degree of equality among the ten local kinds of management analysis should be determined at the stage of preparation for conducting integrated management analysis for specific time and place conditions.

Principles peculiar to integrated management analysis of innovation include:

1. Principle of the “key link” in partially integrated analysis.
2. Principle of priority of the company innovation activity in view of embracing the sixth wave of innovation.

These are basic characteristics of specific principles of integrated management analysis of the innovation activity in a company.

Principle Of “Key Link” In Partially Integrated Analysis

The selection of the “key link” at the initial stage of integratory procedures is a relatively simple task. If the object of these procedures is a modern university, all business-specific kinds of analysis subject to integration are characterized by long planning horizons because of the lengthy process of professional training. Therefore, it is strategic management analysis that will play the main role in the integration.

The task becomes somewhat more challenging with a more complicated, partially integrated object of analysis, for example, the innovation activity (including investment activity). The process of integration of these two kinds of activity is objective and fast. One can say that the principle “all investment only in innovation” is becoming a working principle in this area.

Given the abovementioned, four local kinds of management analysis of innovation (innovation, investment, marketing and competitive) are not completely equal. Their integration is based on innovation management analysis which corresponds to the integrated character of the relevant kind of activity. That is why we can see that the capacity of investment management analysis, marketing management analysis and competitive management analysis is only partially used in innovation management analysis and are not completely absorbed by the latter kind of analysis.

Principle of priority of company innovation activity relating to the transition to the sixth technological paradigm

From numerous definitions of innovation available in contemporary economic literature (Twiss, 1989; Santo, 1990; Levinson, 1973; Schumpeter, 1912) one can infer that most authors consider innovations to comprise not only novelties developed for the first time but also different kinds of improvements and modifications, the existence of which tends to blur boundaries between innovation and non-innovation products.

In our opinion, innovation products that ensure a company’s transition to the sixth technological paradigm must be a priority in the company innovation activity.

The benchmark discoveries and inventions of the sixth technological wave are made as a result of a qualitative breakthrough in improving the key factor and the core of the fifth technological wave related

to it, which includes microelectronics, software development, radio engineering, machine-building, information and communication technologies, communications and laser technology. As one can see from the existing rate of long-term technical and economic development the ceiling for a steady growth of the now prevailing fifth technological mode is about to hit and general outlines of the sixth technological paradigm can already be seen. The boundaries between its fundamental technologies (biotechnology, nanotechnology, material engineering and IT) are getting increasingly blurred. The role of nanotechnology is especially important as it will power a breakthrough to fundamentally new frontiers in computer science, molecular biology, genetic engineering and medicine.

Developing A System of Indicators for Integrated Management Analysis of Innovation

Proceeding from the above mentioned considerations, a system of indicators characterizing integrated innovation was developed as part of this study using the existing statistical practice of accounting in this field and sources beyond accounting.

The most important and still unresolved methodological issue of integrated management analysis of innovation (both for the purposes of research and application) is the information and analytical support of management. The main barrier here is the lack of a well-tested system of indicators, which constitutes the third problem of integrated management analysis of innovation performance.

Constructing an analytical system of indicators is technically difficult because of the complexity of “merging procedures” as part of integrated analysis. First of all, indicators that belong to different types of management analysis (innovation, investment, market, and competition) are to be considered together. Second, it is highly desirable to use the same (structurally identical) indicators for measurement, cost engineering, planning and forecasting as it would make it possible to reduce the workload on analysts, planning specialists and cost engineers.

We believe that among the variety of innovation indicators priority should be given to those of scientific and technological impact, competition, quality, complexity and commercial potential.

It seems advisable to consider the proposed metrics, first of all, as homogeneous groups (within the limits of specific areas of management analysis); and second, to differentiate the analytical metrics on the premise of the three phases of innovation: creation, adoption and outcomes (Ilysheva & Krylov, 2016a, 2016b).

Having grouped the metrics according to specific areas of management analysis for the purposes of its further integration, the author builds a scorecard comprising 21 key indicators that form four groups. The scorecard (Table 4) makes it possible to comprehensively assess innovation performance in a company.

Let’s look closer at each group of indicators.

The first group includes five analytical indicators of innovation analysis per se. They primarily characterize the scientific and technological level of innovations being created.

The indicators of the forward-looking nature of innovation (1.1) indicates the proportion of forward-looking process/product innovations in the total number of process/product innovations created by the company.

The indicator of the scientific and technological level of introduced innovations (1.2) indicates the share of new (that is, excluding upgrades and modifications) product innovations in the total number of product innovations.

The indicator of innovation activity (1.3) is the proportion of the total number of innovative products, including new, upgraded and modified ones in the company’s output.

Table 4. A scorecard for integrated management analysis of innovation performance

Indicator	Application at each phase of innovation		
	Creation of innovation	Adoption of innovation	Outcomes
1. Indicators of innovation analysis	+	+	+
1.1. 1.1. Forward-looking nature of innovation	+	-	-
1.2. 1.2. Scientific and technological level	-	+	-
1.3. 1.3. Innovation activity	-	-	+
1.4. 1.4. Commercial potential	+	-	-
1.5. 1.5. Incentives to innovate	-	-	+
2. Indicators of competitive analysis:	+	+	+
2.1. Competitive capacity	-	-	+
2.2. Innovation intensity	+	+	-
2.3. Process innovation density	-	-	+
2.4. Technological dependence	-	+	-
2.5. Copyright protection of innovation	-	-	+
2.6. Duration of innovation	+	-	-
3. Indicators of market analysis:	+	+	+
3.1. Comprehensive development of product innovation	-	-	+
3.2. Use of advanced technology	+	-	-
3.3. Demand for process innovation	-	-	+
3.4. Versatile applicability	-	+	-
4. Indicators of investment analysis:	+	+	-
4.1. Government support	+	+	-
4.2. Company's reliance on loans	+	+	-
4.3. Financial independence of the company	+	+	-
4.4. Financial indicator of technological dependence	+	+	-
4.5. Foreign participation	+	+	-
4.6. Domestic capital participation	+	+	-

The indicator of the commercial potential of innovation (1.4) is calculated as an average number of licensing agreements per process/product innovation.

The indicator of incentives to innovate (1.5) is the ratio of net income from innovation (in the broadest sense of the word) to the company's payroll in the innovation area of business.

The above indicators of innovation analysis primarily reflect the scientific and technological level of innovation creation, its commercial value and monetary incentives in the field of innovation. However, using only them for guidance will not be enough for advancing innovation in a company and succeeding in this field if due attention is not paid to competitors' achievements. For this purpose, it is necessary to resort to competitive analysis that relies upon competitive intelligence that seeks to reveal the strengths and weaknesses of the main competitors.

The second group of analytical indicators - those of competitive analysis - contains six items.

The indicator of competitive capacity (2.1) is the average score of the competitive capacity of innovative products that is calculated on the basis of the proportion of innovative products with specific competitive capacities in the total sales of innovative products and the scoring of each level of competitive capacity.

The indicator of innovation intensity (2.2) shows the total number of created process/product innovations per designer.

The indicator of process innovation density (2.3) is determined by dividing the number of process innovations in use by the total number of all technological processes.

The indicator of technological dependence (2.4) is the ratio of process/product innovations that were used (adopted) under licensing agreements to the total number of process/product innovations.

The indicator of copyright protection of innovation (2.5) is computed as the ratio of the number of product innovations that are protected with at least two copyright certificates (a patent for an invention, a utility model, a patent for an industrial design, or a trademark certificate) to the total number of created product innovations.

The indicator of the duration of innovation (2.6) reflects the mean time (years) that is needed for creating (using, adoption) process/product innovations.

The indicators of competitive analysis characterize exclusively the relations of the company under consideration with its existing and potential competitors and resulting adjustments to the innovation strategy. It is therefore necessary to supplement competitive and innovation analysis with data obtained through market surveys.

The third group of indicators – those of market analysis – consists of four analytical indicators.

The indicator of the comprehensive development of product innovation (3.1) is the ratio of the number of product innovations that meet a set of key requirements (ecological, after-sale service, and safety) to the total number of created product innovations.

The indicator of the use of advanced technology (3.2) is the share of the advanced technology groups in the company that use process innovations in the total number of advanced technology groups.

The indicator of demand for process innovation (3.3) is the ratio of the number of process innovations that were created and are now used at the company under consideration to the total number of process innovations that were created by the company and are now used by other companies in the industry.

The indicator of versatile applicability (3.4) is calculated as the ratio of the number of the areas of application of process/product innovations to the total number of consumer sectors in the national economy.

The above described indications of market analysis reflect the sustainability of the innovative company in the market of innovation.

The fourth group of indicators – those of investment analysis – includes six analytical indicators.

The indicator of government support (4.1) is the ratio of funds received from the government to total expenditures on innovation from all sources of funding.

The indicator of the company's reliance on commercial loans (4.2) is calculated by dividing commercial loans for innovation by total expenditures on innovation from all sources of funding.

The indicator of the company's financial independence (4.3) is the ratio of its own funds used to finance innovation to total expenditures on innovation from all sources of funding.

The financial indicator of technological dependence is the ratio of the expenditures on procuring innovations under licensing agreements to total expenditures on innovation.

The indicator of foreign participation is the ratio of foreign capital invested in innovation to total investment in innovation at the company.

The indicator of domestic investment participation is the ratio of domestic investment in innovation to total investment in innovation at the company.

The investment analysis indicators described above reveal the sources of funding and investment in innovate at the company under consideration.

The author believes that the system of the key indicators of integrated management analysis of innovation that he has developed (Table 4) is to a large extent a universal one and can be used for examining operational, tactical and strategic aspects of innovation in practically any company. The system implies that the values of the indicators are assessed, diagnosed and projected at the end of each month, at the end of each year, and for the period of the strategy being developed.

However, when doing an integrated management analysis of innovation, its strategy part should take into account the peculiarities of the company, which necessitates supplementing the above system of indicators with the indicators of the innovation part of the company's Balanced Scorecard. The most general one are shown in Table 3 (see above).

Selecting Sources of Information for Conducting Integrated Management Analysis of Innovation

When addressing the methodological issue of establishing the forms, sources and means of obtaining information for conducting an integrated management analysis of innovation, it is advisable to use non-formalized ways of getting it along with more traditional approaches to primary data collection (Kovalev, 2004, 2007).

In our view, the main sources providing information for integrated management analysis of innovation are:

1. Up-to-date statistical reports.
2. Management accounting data of the company.
3. Findings of an expert survey polling the most competent professionals in the industry being researched.
4. Findings of competitive intelligence.
5. Findings of customer surveys.

The first two sources of primary information are traditional ones that enjoy more trust than the other three that are considered to be non-formalized sources of obtaining necessary information.

One should bear in mind, though, that modern technologies of applying non-formalized methods of information support of analysis have now reached a high degree of sophistication. The peculiarities of conducting, for example, a specially arranged expert survey of the most competent professionals in the industry being research are extensively covered in the literature (Saaty, 1993).

Competitive intelligence is a crucial source supplying primary information for integrated management analysis of innovation.

Competitive intelligence is defined as a tool for the competitive environment, the process of gathering task-specific information about competitors for making decisions about the strategy and tactic of doing business (Ilyshev, Ilysheva & Selevich, 2010).

Competitive intelligence is

- 1) the action of collecting and processing of data from various sources for the purposes of decision making in order to improve the competitive advantage of a commercial organization. Unlike industrial espionage, competitive intelligence is done legally and in compliance with ethical standards;

- 2) the structural unit of a company that performs the above functions;
- 3) a set of measures aimed at rendering information and analytical support to managers with the help of specific data collection methods so that they get a deep understanding of the present position of competitors and development trends in their operation.

Competitive intelligence rests upon the analysis of the statics and dynamics of the competitors' innovative business using open source and partially restricted information. It is also expected that the results of such analysis should be delivered to the company management and stakeholders on a timely basis.

It is data gathering rather than data analysis that is the primary goal of competitive intelligence. The word "analysis" is used here to denote a tool of extracting useful information from indirect data.

Among the tasks of competitive intelligence are:

- information and analytical support of management decision making;
- "an early warning system", i.e., informing decision makers as early as possible about threats that can harm the business;
- identifying opportunities for furthering the business;
- detecting (together with the security department) attempts by competitors to access confidential information of the company;
- risk management with the purpose of ensuring the company's timely response to rapid changes in the environment.

The above listed tasks of competitive intelligence are critical for the company; they serve the purpose of achieving the fundamental goal of the competitive intelligence department – that of giving the company staff a feeling of security by helping them realize that the future of the company is in their hands and that it will not become a victim of circumstance or someone's hostile action.

As Ian Gordon points out, competitive intelligence boils down to obtaining publicly available information in order to reach the company's goals (Gordon, 2002). Competitive intelligence facilitates organizational improvements, differentiation and a victory over rivals in competition.

There is a system of restrictions that are legally imposed on intelligence activities. Going beyond those restrictions turns intelligence into espionage. In other words, one should not confuse competitive intelligence with industrial espionage or state intelligence.

The thin line between these notions is determined by laws, the personality of the customer, the professional level of the intelligence expert, and ethical restrictions (Orlov, 2011). From the standpoint of regulatory compliance, everything is simple: if no law (criminal law in the first place) is broken, it is competitive intelligence. Otherwise it is industrial espionage.

The boundary between the notions is more vague if we look at it in terms of ethical restrictions.

Usually people who violate ethical rules and principles are expelled from professional associations that stick to these rules and principles.

The results of surveys of customers and consumers, as well as the first two sources of primary information, are considered to be traditional ones and help reveal their needs for new products and services that will be of the highest value to customers and consumers along dimensions like price, quality, functionality, image, reputation, relationship and service (Kaplan & Norton, 1996).

Selecting methods of integrated management analysis of innovation

Speaking of the selection of methods of integrated management analysis of innovation (the fifth methodological issue of integrated analysis), it has to be noted that any of the six classification groups of the methods is acceptable here (Kovalev, 2004):

1. Non-formalized (logical) methods are based on the logical description of analytical procedures rather than the use of rigorous analytical dependencies. These are expert evaluations, scenarios, psychological and morphological comparisons, scorecards, systems of analytical grids etc. The application of such methods is characterized by subjectivity because a lot depends on the analyst's intuition, experience and expertise.
2. Elementary methods of microeconomic analysis that aim to analyze the effectiveness of the company's performance and identify reserves for improvement. Methods (tools) of factor analysis have a particular weight in this group. These are chain substitution methods, the method of arithmetic differences, the method of identifying the isolated influence of factors; differential, logarithmic and integral methods.
3. Traditional methods of economic statistics are designed to produce quantitative evaluations of phenomena and processes and are adapted to the peculiarities of research on social and economic systems. They have broad application in all branches of microeconomic analysis. Among them are the arithmetic mean, the grouping method, basic time series methods, the indexing method. They are conventionally referred to as traditional because of their prevalence, simplicity and historical background.
4. Mathematical and statistical methods (stochastic modeling) do not allow for the recurrence of the required phenomenon for the purposes of forming the totality, which is typical of experiments; correlation between individual factors and indicators is extremely high; it is not always possible to model the required situation. The analyst should, therefore, have a very clear idea of the conventionality of quantitative estimates yielded by such methods and should not overemphasize them. By using these methods -- correlation and regression analysis, dispersion analysis, cluster analysis, methods of modern factor analysis, methods of space-time totality processing - it is possible to predict the dynamics of the key indicators, to develop scientifically proven standards and identify the most significant factors.
5. Decision making methods are used when the same person is responsible for providing analytical justification for the decision, and making it. This calls for mastering the techniques that were developed as part of the decision theory: situation analysis and forecasting, imitation modeling, decision tree, linear programming, uncertainty analysis.
6. The methods of financial computing (discounting and compounding, cash flow analysis) are based on the idea of the time value of money; they help make managerial decisions that prove effective in the long-term run. Decision makers as well as analysts who assist them must be capable of doing such computing.

Areas of Application of The Output of Integrated Management Analysis of Innovation

The output of the analysis, the system of valuation indicators of innovation, investment, marketing and competitive analyses above all, can find application at various tiers of the governance hierarchy in order to

add scientific substance to projections, concepts, strategies and development programmes being designed and to improve innovation management (in the broadest sense of the word) in a company (an industry or a region). The results also seem useful for furthering the theory and methodology of economic analysis.

The key areas of application for the obtained analytical results are listed below.

1. As a contribution to the theory and methodology of economic analysis:
 - 1.1. For substantiating the choice of alternative innovation projects that meet the criteria of this or that type of activity-specific analysis.
 - 1.2. For revealing the capabilities of non-formalized analysis methods when implementing integration procedures and selecting the most successful innovation project.
2. As an improvement to the information and analytical support of decision making in management:
 - 2.1. To get a comprehensive assessment of the state of innovation, innovation trends and development factors.
 - 2.2. To identify untapped reserves and opportunities for growth.
 - 2.3. To develop a suit of extrapolation and exploratory normative projections for the short-, mid- and long-term planning.
 - 2.4. To work out development concepts and improve innovation management in the foreseeable future.
 - 2.5. To build alternative strategies for reaching set goals in the field of innovation.
 - 2.6. To design targeted regional programs of government support for priority innovation development areas.
 - 2.7. To construct a system of indicators and organize innovation monitoring.

Let's dwell upon some of the key areas of using the analysis results.

For the purposes of substantiating the choice of alternative innovation projects that meet the criteria of this or that type of activity-specific analysis, the company's own planned or borrowed innovative projects are assessed according to the criteria of the specific kind of management analysis that are incorporated into its rating indicators. For example, when innovation analysis is performed, the following criteria of the project success are applied: is the innovation ahead of its time; is it scientifically and technically advanced; is it going to be commercially viable.

When investment analysis is done, the criteria of success can include the coefficient of the company's autonomy in financing innovation; the fiscal indicator of technological dependence, investment per innovative product etc., Marketing specialists doing marketing analysis will lay the emphasis on such indicators as the market share of the new product, the complexity of its development and its usability etc. Competitive intelligence officers and analysts will give priority to the indicator of competitive capacity, the copyright protection of innovations, development time etc.

The possibility to revealing the capabilities of non-formalized analysis methods when implementing integration procedures and selecting the most successful innovation project indicates that a peculiar algorithm has been found for integrating the results of the activity-specific types of management analysis. The core of the algorithm is the method collective expertise and procedures of reconciling expert opinions on the degree of success of an alternative innovation project.

An all-round assessment of the state of innovation, trends and development factors is done by using a specially designed scorecard of integrated management analysis that contains 21 indicators (see Table 4) and provides answers to the above questions.

Identification of untapped reserves and opportunities for innovative growth is a logical continuation and development of the previous field of application. For example, if the innovation activity indicator, which is measured as the ratio of the total number of innovative products, to the company's output, is lower in the reporting period than in the baseline period, then obviously there are untapped reserves for improvement. If the indicator of innovation activity that is measured as the proportion of fundamentally new innovative products, is much lower than the previous indicator, the company has reserves for spurring its innovative growth.

The development of a suit of extrapolation and exploratory normative projects for short-, mid- and long-term planning precedes the creation of a concept and strategy of the company's innovative development. The projections are an essential element of information and analytical support of appropriate decision making processes.

When working out concepts for the development and improvement of innovation management in the foreseeable period, an integrated analysis of this activity provides a solid scientific foundation for substantiating the mission, goals and objectives of the company's development for an extended period of time. One should bear in mind that the scientific validity of the concept increases if the overwhelming majority of the known activity-specific types of management analysis are used in the form of the fullest possible integrated analysis, rather than in isolation.

When working out alternative strategies for the implementation of the set goals in the field of innovation one should remember that the strategy requires a much higher degree of detail in the goals and objectives of the company's development, than the concept. Moreover, unforeseen (at the stage of strategy development) changes in external and internal operational conditions of the company might occur in the course of strategy implementation. So, unlike the concept, several alternative development strategies are usually created. The role of innovation analysis here can hardly be overestimated.

When developing targeted regional programs of state support for priority areas of innovation, integrated management analysis (especially its innovation and investment components) enable government agencies to identify the most promising trends of innovative development and provide them with extensive support.

When constructing a system of indicators and organizing innovation monitoring, it is extremely important to select the right indicators and make sure that monitoring is done on a regular basis. Otherwise one should hardly expect that national companies will adopt an innovation-based development model any time soon.

DISCUSSION

We believe that the results of the study outlined above that are associated with the creation of the conceptual framework for integrated management analysis of innovation as a radically new type of management analysis making it possible to study innovation in the broadest sense are one-of-a-kind and can therefore be considered as new and unique.

At the same time, one cannot help but take into account existing research into the application of analysis to innovation that was conducted by the most prominent scholars and experts in the field.

Let us summarize the arguments of some of them.

R. Kaplan and D. Norton characterize the innovation process as one of the most important internal business processes and note that it consists of two components (Kaplan & Norton, 1996): identification of the market and creation of the product (service). Proceeding from this, they identify two steps in the

analysis of the innovation process. During step one, the analysis should yield adequate and accurate answers to two questions:

1. What range of benefits will customers value in tomorrow's products?
2. How might we, through innovation, preempt competitors in delivering those benefits to the marketplace?

Measures for this analysis could be the number of entirely new products and services developed, success in developing specific products and services to target customer groups, or just the preparation of market research on emerging and future customer preferences. These measures provide the basis for the second step of the analysis that consists of three elements:

1. basic research to develop radically new products and services for delivering value to customers;
2. applied research to exploit the existing technology for the next generation or products and services, and
3. focused development efforts to bring new products and services to market.

J. Pearce II and R. Robinson largely associate the analysis of innovation with the study of two types of risk that are brought about by innovation: market risk and technological risks (Pearce II & Robinson, 2011). Market risks have to do with uncertainty as to the availability of a market for the new product or service, its size and the pace of growth, which boils down to the question of whether anyone is going to buy them. Technological risks have to do with the uncertainty of technological development, the complexity of creating technical standards and universally accepted models: which of the available technologies will actually work? Technological risks are of critical significance to innovative products, while market risks matter to business models and processes. When analyzing innovation risks one should focus on researching the market and new applications for existing technologies.

According to C. Christensen and M. Raynor, the analysis of the innovation process should aim to make more predictable by finding answers to the following key questions (Christensen & Raynor, 2003)

1. How can we beat our most powerful competitors?
2. What products will customers want to buy?
3. Who are the best customers for our products?
4. How to get the scope of the business right?
5. How to avoid commoditization?
6. Is our organization capable of disruptive growth?
7. How to manage the strategy development process?
8. What sources of funding to use?
9. The role of senior executives in leading new growth.

R. Grant proposes principles of analysis that one should use as guidance for ensuring better efficiency of the strategic management of innovation (Grant, 2015):

- evaluate the potential for an innovation to create value;
- assess the relative advantages of licensing, alliances, joint ventures and internal development as strategic options for exploiting innovation;

- identify the relative advantages of being a leader or a follower in innovation.

He also points to a fundamental dilemma of innovation being an unpredictable process that requires a favorable organizational context, while strategy is about making decisions on the allocation of resources. Obviously, it has to be taken into account when performing strategic analysis of innovation in a company.

According to G. Hamel, the analysis of each innovation process that is conducted as part of innovation management implies asking and getting answers to the following questions (Hamel, 2006):

- Who owns the process?
- Who has the power to change it?
- What are the success metrics?
- Who are the customers of this process?
- Who gets to participate?
- What are the data or information inputs for this process?
- What analytical tools are used?
- What events and milestones drive this process?
- What kind of decisions does this process generate?
- What are the decision-making criteria?
- How are decisions communicated, and to whom?
- How does this process link to other management systems?

After documenting the details of each innovation process, a cross section of interested parties such as the process owner, regular participants, and anyone else who might have a relevant point of view is assembled. They assess the process in terms of its impact on the management challenge the company is seeking to address.

Having summarized above the opinions of some of the leading scholars in the field of innovation management, we would like to point out the drawbacks of their concepts of innovation analysis:

- as a rule, innovation analysis suggests that answers are found to relevant questions using seemingly non-formalized methods, while there is no conceptual approach as to how to conduct the analysis itself;
- the questions related to innovation research may lie in various fields depending on the scholar's affinity (marketing, technology, finance, management), and yet they are primarily focus on market research for the innovations being analyzed, which hampers comprehensive analysis;
- there is no universal system of indicators (except for perhaps some general metrics of the innovation component of the Balanced Scorecard that are spread over typical strategic goals of the innovation process. Moreover, each company has its own Balanced Scorecard as it is determined by the company strategy) or an innovation analysis procedure.

These drawbacks hardly help provide adequate information and analytical support for effective decision making in the field of innovation management.

Proceeding from the idea that effective innovation management is only possible when this area of business is viewed as a holistic system in which the processes of the development, creation and use of innovations form a single innovation project, the author of this paper has created a conceptual framework

for integrated management analysis of innovation that makes it possible to overcome, to a large extent, the above drawbacks and helps increase the effectiveness of innovation management.

Unlike the scholars mentioned above, the author has also worked out the key methodological aspects of integrated management analysis of innovation (a system of analytical indicators, that includes universal analytical indicators (Table 4), as well as the metrics of the innovation component of the balanced scorecard (Table 3), analysis procedures, main sources of information for the analysis, analysis methods, areas of application).

The author therefore believes that his solution to the problem of improving information and analytical support of innovation management through the development of a conceptual framework of integrated management analysis of innovation is more detailed, better-reasoned and explicative than other available works on the matter, and that it contributes to scientific knowledge in the field of modern innovation management.

CONCLUSIONS

Having outlined the conceptual and methodological framework of integrated management analysis of innovation as a fundamentally new type of management analysis and, consequently, a new analytical tool of innovation management, one can conclude the following:

- there is no alternative to an innovation-driven development model in today's market economy. This enhances the relevance of research on the theory, methodology and methods of innovation analysis that helps take adequate and effective decisions in the field of innovation management;
- effective innovation management is only possible when this area of business is viewed as a holistic system in which the combination of the processes of the development, creation and use of innovations form a single innovation project;
- in order to manage such projects effectively, it is necessary to create and apply a new type of management analysis – integrated management analysis of innovation;
- the methodological framework for the development of integrated management analysis innovation is provided by a conceptual approach to the integration of innovation process, the conceptual frameworks of activity-specific types of management analysis, and the concept of the Balanced Scorecard (its innovation component);
- the subject matter of integrated management analysis of innovation is innovation (in its broadest sense, that is, including investment in innovation), at companies that have adopted an innovation-driven development model or are in the process of such transition;
- the scope of integrated management analysis of innovation is the processes of forming relevant resources, associated costs and results that occur in the court of innovation at a company, as well as the most significant processes that take place in the consumer market and the company's competitive environment;
- the main goal of integrated management analysis of innovation is to provide the managers and owners of a company with complete, accurate and quality information about the effectiveness of its innovation-driven operation, untapped resources, and the possibility of their exploitation;
- the goal consists of activity-specific subgoals that are related to activity-specific type of management analysis that are used for the study of innovation: innovation analysis, investment analysis, competitive analysis; market analysis;

- the specific principles of integrated management analysis of innovation include the bottleneck elimination (key link) principle in partially integrated analysis and the principle of the priority of innovation that is driven by the Digital Revolution;
- a system of indicators of integrated management analysis of innovation incorporates the indicators of innovation analysis, investment analysis, competitive analysis, and market analysis, which are largely universal and can be used when examining innovation in all its aspects (operational, tactical and strategic) in almost any company;
- if specific features of a company have to be taken into account when conducting an integrated management analysis of innovation from a strategic perspective, the above described system of indicators is supplemented with the innovation component of the company's Balanced Scorecard;
- integrated management analysis of innovation includes the assessment, diagnosis and forecast of the values of its indicators;
- the main sources of information support of integrated management analysis of innovation is up-to-date statistics reports, managerial accounting data, the findings of a special expert survey of the most competent professionals in the industry under study, competitive intelligence data, the results of customer surveys;
- the methods of integrated management analysis of innovation could include non-formalized (logical) methods of analysis, elementary methods of microeconomic analysis, traditional methods of economic statistics, mathematical methods of statistics, methods of the decision making theory, financial computing methods;
- the obtained analytical results could be used not only for improving information and analytical support of innovation management in a company, but also for furthering the theory and methods of economic analysis.

FURTHER RESEARCH

The conceptual and methodological framework of integrated management analysis described above is only an outline of this new area of research and practice and provides a sort of theoretical guidance for further development of this analytical tool of innovation management, especially in terms of its application.

There are several trends in which research into integrated management analysis of innovation can be furthered:

- expansion of the system of key indicators of integrated management analysis of innovation (Table 4) and their further elaboration with the purpose of ensuring greater accuracy of comprehensive research into innovative performance;
- development of the criteria of qualitative assessment of the deviation of the actual values of the key indicators of integrated management analysis of innovation from their baseline values in terms of materiality;
- establishment of standard values for each key indicator of integrated management analysis of innovation and the introduction of a three-group classification (best, medium, worst);
- creation of a method of ranking innovation performance through scoring by experts who use the key indicators of integrated management analysis;
- creation of specific methods for diagnosing (factor analysis) and forecasting each of the key indicators of integrated management analysis of innovation;

- devising a system of indicators and methods of integrated management analysis of innovation that would take into account the features of industry-specific innovation in companies that operation in different branches of the economy;
- development of economic and mathematical models and software that would make it possible to use integrated management analysis of innovation for innovation management.

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KEY TERMS AND DEFINITIONS

Analysis: Is a method of scientific research of phenomena and processes, which is based on the study of the constituent parts, elements of the system under study.

Balanced Scorecard (BSC): Is a set of parameters that comprehensively characterize the activities of an organization in a modern market economy.

Benchmarking: Is the activity by which a firm examines the “best” product and the marketing process used by direct competitors and firms in similar areas to identify ways the firm can improve its own methods.

Competitive Intelligence: Is a tool for studying the competitive environment, which is a targeted collection of information about competitors for making management decisions on further business strategy and tactics.

Competitiveness: Is a concept that includes the level of economic, technical and operational parameters that make it possible to withstand rivalry (competition) with other similar firms/enterprises/products on the market.

Competitor: Is a person, a group of persons, a firm, an enterprise that competes with the person in question (a group of persons, a firm, an enterprise) in achieving identical goals, in an effort to have the same resources, benefits, and occupy a position in the market.

Forecasting: Is the use of information (the meaning of causal relationships in the subject area) to predict the behavior of the control object under the influence of certain factors.

Innovative Activity: Is the process of finding and using scientific and technological achievements with the help of research work that allows you to create and implement innovations that provide an intra-company effect and / or success in the domestic and / or foreign market.

Innovative Analysis: Is a unified information system of qualitative and quantitative indicators, criteria and methods designed to assess the needs, possibilities, feasibility, and effectiveness of introducing and using innovations in the activities of an economic entity without threatening its further functioning.

Innovative Investment Project: A plan or program of activities for the development and implementation of product-innovations, process-innovations, allocation (organizational and managerial) innovations related to the implementation of capital investments for the purpose of their subsequent reimbursement and profit.

Investment Analysis: Is a set of methodological and practical techniques and methods for developing, substantiating, and evaluating the feasibility of making investments in order to make an effective decision by the investor.

Investments: A temporary refusal of an economic entity from the consumption of resources (capital) at its disposal and the use of these resources to increase its welfare in the future.

Key Success Factors: Are the most significant characteristics of the market, firm, competitors.

Management: Is the highest form of processing and using information to achieve the goals of maintaining the stable functioning of the control object and transferring the control object to a predetermined target state.

Management Analysis: Is a comprehensive analysis of internal resources and external capabilities of an enterprise, aimed at assessing the current state of the business, its strengths and weaknesses, and identifying strategic problems.