



Estimation Technique of Integration Processes in Innovation

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ABSTRACT

The relevance of the chosen topic is determined by the need to recognize innovative activities as priority areas of socio-economic development in the face of increasing competition of national and regional innovation systems. The purpose of the article is to develop a theoretical approach to studying the integration space of modern holding structures using key indicators of integration efficiency. The tendencies of innovative activity in realization of joint innovative projects are analyzed. The author's approach with use of key indicators of efficiency of integration processes in a projection of the balanced system of indicators is offered. The materials of the article are of theoretical and practical importance for the development and implementation of federal and regional innovative development programs, as well as in the development of the strategy of state innovation policy.

Keywords: Integration, innovations, joint projects, a balanced system of indicators, key performance indicators, scientific and educational institutions

INTRODUCTION

At the turn of XX - early XXI centuries the world economic system has entered a new stage of its development - the growing processes of economic globalization cause the growth of interrelations and interdependence of the national economies of all countries in the world. In this connection, there are qualitative changes in the system of economic relations; economic entities to maintain flexibility, competitiveness and to form innovative competencies need to adapt to the constantly changing conditions of the external environment.

In today's realities, the distinctive feature of economic globalization is that it is the highest stage of economic integration achieved through the unification, complementarities and interconnection of information flows, investments, innovations, R & D results, goods and services against the transformation of the industrial type of economic systems into innovative ones.

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In modern conditions, sustainable dynamic development is possible only on the basis of the formation of an innovative type of economy, the deployment of key elements of the national innovation system. The transition to a postindustrial society demonstrates the importance of activating innovative processes as one of the leading factors of economic growth.

Many scientists have been involved in the study of national innovation systems: W. Kingston [1], P. Patel & K. Pavitt [2], S. Metcalfe [3], Y.V. Yakovec [4], B.A. Lundvall, P. Intaracumnerd & J. Vang [5] and others.

On the other hand, in the Russian innovation sphere, the deterrent factors of innovative development are: the high cost of research, the greater risks, the imperfection of the regulatory and legal framework governing the financing of innovation, which significantly reduces incentives for innovation. Research on this problem is reflected in the works of: S.V. Druzhinina [6], L. Leydesdorff & Van den Besselaar [7], H. Etzkowitz [8], I.G. Dezhina & V.V. Kiseleva [9], D. Satinskiy & S. Botot [10], A.D. Shmatko [11], A.I. Shinkevich et al. [12], F.F. Galimulina et al. [13].

However, despite many attempts, the problem of ensuring effective integration of innovative agents, as well as the problem of assessing the performance of the latter, has not been resolved.

MATERIAL AND METHODS

Methods of research

During the research, the following methods were used: analysis, synthesis, system analysis, systematization and generalization of facts, method of comparison, descriptions and analogies.

Theoretical basis of the research

Theoretical basis of the research is formed by fundamental and applied works of foreign and domestic scientists exploring the categories "innovation economy", "integration", engaged in the development of management tools of innovative and modern development of modern economic systems.

Stages of research

The study was conducted in three stages:

- 1) the systematization of the main trends in the management of innovative development of holding entities;
- 2) analysis of trends in innovative activity of organizations in the Russian Federation;
- 3) presentation of a classification of ways to assess the effectiveness of integration;

the proof of the advantage of the knowledge economy in the transition to a new quality of economic growth in the Russian economy;

4) development of key indicators of the effectiveness of integration processes in the BSC projection.

RESULTS

Systematization of the basic tendencies in management of innovative development of holding entities

The generalization of theoretical approaches to the study of the integration space of modern holding structures made it possible to systematize the main trends in managing the innovative development of holding entities.

Firstly, in integrated holdings, the management of innovation development is focused on improving the efficiency and reliability of the functioning of interconnected technological and logistic chains in order to achieve the smooth operation of all participants in integrative entity, as well as an extended chain that includes suppliers, consumers and intermediaries within the activities of vertically integrated companies.

Secondly, in integrated holdings, the management of innovative development is aimed at diversifying the business, including the development of new markets, technologies, the production of new types of products and services. It should be noted that in conglomerate-type holdings, the production of innovative goods and services is delegated to subsidiaries. Diversification of business contributes to building technological, production and market potential, increasing the holding's sustainability by redistributing financial and other resources between promising lines of business.

Third, in integrated holdings, the head organization is entrusted with the functions of strategic management, the solution of strategic tasks related to informatization, business diversification, market expansion, strategic cooperation with partners, and the implementation of organizational, technological and marketing innovations. Current operations are performed by subsidiaries.

Fourthly, in mixed holding structures, the management of innovative development leads to the creation of the holding's own service network, where individual services of enterprises (transport, repair, construction, etc.) are reorganized and registered as separate legal entities that centrally serve all enterprises, included in the holding.

Fifthly, in integrated holdings, the management of innovation development is focused on reducing risks and reducing the negative consequences from the introduction of innovations. For these purposes, subsidiaries are created that take risks associated with the development of innovations, thus the financial stability of the holding is preserved.

Sixthly, in contractual holdings, the management of innovation development is aimed at isolating the licensed types of activities - audit, insurance, consulting, investment, etc.,

which are delegated to subsidiaries, since the licensed activities must be exclusive and cannot be combined with the main type of business.

Seventh, in the cross-holdings, the management of innovation development is aimed at reducing the supply chain and increasing the transparency, efficiency, flexibility and timeliness of information and financial flows between all participants of business processes within the extended supply chain [14].

Analysis of trends in innovative activity of organizations in Russia

Analyzing the trends of innovative activity, it should be noted that the share of organizations that carry out technological innovation in the industrial sector according to the results of 2014 was 9.7%, having increased by 0.4 percentage points compared to 2010, on the organizing of connection this indicator was 9, 5% (decrease compared to 2010 - 1.3 percentage points). Attention is drawn to the fact that for industrial enterprises the share of innovative goods in the total volume of shipped goods increased from 4.9% in 2010 to 8.2% in 2014; on the communication's organizations there is a negative dynamics - the value of the indicator decreased from 4.7% to 3.3%. However, for medium-term communications' organizations, the share of costs for technological innovation was higher than for industrial enterprises with a predominance of a declining trend, ranging from 2.9% in 2010 to 2.4% in 2014 (for industrial organizations - from 1.5% to 2.1%, respectively) [15].

One of the indirect indicators of integration in the innovation sphere can be considered participation in the implementation of joint projects. For enterprises of the industrial sector of the economy, the share of organizations participating in joint projects in the total number of organizations that carry out technological innovations is characterized by the dynamics of decline, starting from 2009, when the value of this indicator was 36%, according to the results of 2014. - 32.2%. A similar trend is noted in the organizations of communication, where the share of organizations participating in joint projects for the same period decreased from 30.2% to 20.6% [15].

Classification of ways to assess the effectiveness of integration

It is obvious that in the integration process it is necessary to carry out constant monitoring and control over the course of the integration process and, if necessary, to make adjustments to the integration strategy. A Balanced Scorecard (BSC) can be used as a tool for monitoring the implementation of the integration strategy.

Balanced Scorecard (BSC) is a set of interrelated financial and non-financial performance indicators of an organization, reflecting the degree of achievement of its strategic goals and focused on four projections: customers, finance, internal business processes, training and growth. The methodology of the balanced scorecard implies the separation (in accordance with the chosen mission and strategic concept) of key performance indicators in the specified areas of activity (prospects).

BSC acts as a system to monitor the effectiveness and achievements of the company's strategic goals. Change in the indicators of the group "training and growth" affects the indicators of the group "business processes", which, in turn, are reduced to the groups

"clients and marketing" and then "finance". Thus, revealing the changes in the first three groups, we can predict the trends in the "finance" group.

Separately, in the works of scientists, the types of efficiency characteristic of integration processes are singled out. S.M. Ishchenko [16] cites the following types of effects of integration interaction:

- agglomeration effect;
- increase in output;
- increasing the efficiency of service of providers;
- increase in the range of products;
- centralization of marketing activities;
- synergetic effect in the field of R & D, finance;
- increase in market share;
- faster achievement of strategic goals;
- saving of financial resources;
- reduction of risks due to their redistribution among the participants of integration structures;
- diversification of business, competencies;
- development of corporate culture;
- elimination of duplicate functions and information sweets.

A special place in the studies of the effectiveness of integration processes is assigned to factors that affect the quality of interaction between business entities. In S.V. Gvardin's and I.N. Chekun's [17] opinion, such factors include the following:

- effectiveness of organization and conduct of business;
- formulation of strategic goals of the company;
- the company's readiness for the sale of various types of assets;
- business security, including political, economic, etc .;
- market trends;
- degree of nationalization of business;
- degree of business diversification;
- opportunities for increasing the market share;

- level of market speculation;
- company image;
- level of competition in the market.

I.V. Maslikov and V.V. Teslenko [18] subdivides the factors influencing the course of integration processes into two types:

- internal: the company's resources for its own growth and new markets, the potential for additional value, the advantages of speed for the developed markets, the ambitions of the employees of the organization, the propensity to risk of management of the organization;

- external: the level of competition in the market, the risk of investment activity in new markets, services and products, fluctuations in the legal framework of the organization.

Other researchers divide the integration factors into three categories:

- level of management (dynamism and quality of management, market position, state of resources);

- the state of the company's external environment (level of competition, tax policy, regulatory framework, market conditions);

- financial position (level of profitability, market capitalization of business).

Classification of methods for assessing the efficiency of integration is shown in Fig. 1. Prospective ways of assessing the integration efficiency are a comparison of the cost of integration processes with an estimate that contains the present value of the final income received from the integrating company in the future. The retrospective method of evaluation is based on an analysis of change in the parameters of the economic activity of the organization. Here, the effectiveness is analyzed after the formal integration of companies. Retrospective methods evaluate the economic outcome of integration [19].

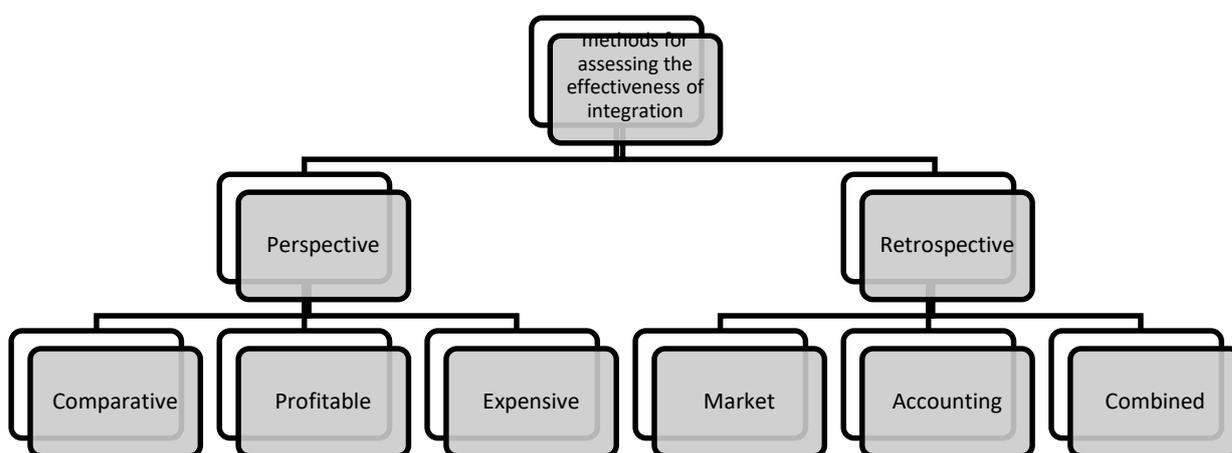


Figure 1: Methods for assessing the effectiveness of integration

Key performance indicators of integration processes in the BSC projection

To assess the effectiveness of integration processes, a technique is needed to determine how efficiently the management of the implementation of the chosen integration strategy is managed and how it can be improved. Achievement of the strategic goals of integration, increasing the efficiency of business processes of technological chains and the work of enterprises and partner organizations for integration as a whole is largely facilitated by the introduction of quantitatively measurable and reliable in the evaluation the indicators - KPI (Key Performance Indicators).

Key Performance Indicators (KPI) are the main measures of the efficiency of resource use in an integrated network, which together assess the effectiveness of network management and are the basis for integrated planning, analysis, control and monitoring. Within the framework of the KPI management, along with the evaluation of financial indicators for assessing the effectiveness of the activities of network structures, it is proposed to use non-financial indicators that assess the degree of customer satisfaction, the efficiency of internal administrative and technological business processes, energy and resource efficiency, innovation activity, staff potential - these indicators in turn, ensure financial success of integration entities.

The following requirements are imposed on the construction of KPI:

- each coefficient must be clearly defined;
- approved indicators and standards should be achievable;

- each of the indicators should be in the sphere of responsibility of those people who are being evaluated;
- indicators should promote motivation and increase the effectiveness of staff, and this is directly related to setting goals;
- indicators should be comparable, i.e. one and the same indicators are compared in two similar situations and periods;
- the dynamics of the change in the coefficient should be able to be presented graphically so that on the basis of the results it is possible to draw conclusions and make managerial decisions;
- each indicator should be the basis for analysis.

With regard to the technique for assessing the effectiveness of managing the integration processes by the KPI, it is proposed to use the following indicators, which are presented in the projection of a balanced system of indicators: finance, clients and marketing, business processes, training and growth (Table 1). As the interaction of science, education and industry is considered within the integrated network, the KPI will be represented for each selected sector of integration - scientific and educational institutions and industrial companies.

Table 1: Key indicators of the effectiveness of integration processes in the BSC projection (developed by the authors)

Projection of BSC	Integration Sector	Examples of KPI for an integrated structure (network)
1. Finance	1.1 Research and educational institutions	1.1.1 the volume of investments in R & D;
		1.1.2 Return on Investment in R & D
	1.2 Industrial companies	1.2.1 terminal value;
		1.2.2 return on investment;
		1.2.3 market value of the share;
		1.2.4 liquidity ratio;
	1.2.5 profitability of sales;	
	1.2.6 profitability of goods sold	
2. Clients and marketing	2.1 Research and educational institutions	2.1.1 market share;
		2.1.2 degree of customers' satisfaction;
		2.1.3 quality of service (technology) by consumers' estimations

		2.2.1 market share;
		2.2.2 degree of customer satisfaction;
	2.2 Industrial companies	2.2.3 level of customer service;
		2.2.4 accuracy of the order parameters;
		2.2.5 the quality of the product (service) by consumers' estimations
	3.1 Research and educational institutions	3.1.1 time to develop a new product, technology;
		3.1.2 the life cycle of innovation;
		3.1.3 Resource productivity of the research infrastructure
3. Business Processes	3.2 Industrial companies	3.2.1 time to develop and market new products;
		3.2.2 share of innovative products in the total volume of shipped products;
		3.2.3 the time of delivery of the goods;
		3.2.4. The duration of the production cycle;
		3.2.5 the duration of the logistics cycle;
		3.2.6 Resource efficiency of logistics and production infrastructure
4. Training and growth	4.1 Scientific and educational institutions	4.1.1 staff productivity;
		4.1.2 staff turnover;
		4.1.3 level of automation;
		4.1.4 the performance of information systems;
		4.1.5 the share of new educational curricula in the total volume of training curricula;
		4.1.6 The share of new educational technologies used in training
	4.2 Industrial companies	4.2.1 staff productivity;
		4.2.2 staff turnover;
		4.2.3 level of automation;

DISCUSSION

It should be noted that it is reasonable to assess the synergetic economic effect of integration on the basis of a combination of quantitative and qualitative criteria. On the one hand, the formation of an integrated structure (network) can be viewed as a project. In this case, the efficiency indicators are the indicators of the economic efficiency of the investment project: the net present value (NPV), the internal rate of return (IRR), the discounted payback period (DPP), and the index of profitability (PI). On the other hand, the creation of an integrated structure is characterized not only by quantitative indicators, but also by qualitative ones, connected with the resources involved, goal-setting, knowledge chains, information flows. To assess the qualitative indicators of integration efficiency, the following methods can be used: expert assessments, methods of strategic and competitive analysis, and the like.

The previous researches, which were made by T. Hagerstrand [20], G. Mensch [21], M. Porter [22], S.C. Wheelwright, K.B. Clark [23], L. Leydesdorff, Van den Besselaar [24], S. S. Kudryavtseva et al. [25] are devoted to national innovation systems.

However, the scientific works devoted to the assessment of the effectiveness of integration processes in the innovation sphere are of a debatable nature.

CONCLUSION

Thus, the main principles for assessing the effectiveness of integration processes in the innovation sphere are:

- all subjects of integration should contribute to the achievement of the combined effectiveness of the integrated structure;
- the contribution of each subject of integration to the achievement of synergetic efficiency should be assessed by common methods and indicators;
- every subject of integration must have its own goal for integration formation;
- an assessment of the effectiveness of integration should be carried out for all of its subjects and the integration structure as a whole on the basis of quantitative and qualitative indicators;
- all subjects of the integration structure are interconnected and interdependent;
- evaluation of the effectiveness of integration processes is possible only on the basis of objective information;

- in the basis of an estimation of efficiency of integration processes there should be a procedure of "cascading", i.e. distribution of responsibility for achievement of key performance indicators at lower levels and management links of the integrated structure;

- the influence of the subjects of the integrated structure on the efficiency of integration tends to achieve a positive result, when maximizing the assessment of the economic efficiency of the integration process as a whole;

- the achievement of synergistic effectiveness of integration processes should focus on enhancing the intellectual, innovative and information potential of the integrated structure and transforming them into innovative goods for the purposes of innovative development.

Thus, all of the foregoing enables us to conclude that the management of integration processes and the assessment of their effectiveness in the innovation sphere are special categories of management theory, which have a specific nature and require the taking into account of the described features. The materials of the scientific research are of theoretical and practical significance for the development and implementation of federal and regional programs of innovative development, as well as in the development of the strategy of state innovation policy.

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