

## INNOVATIVE SEGMENT IN THE MECHANISM OF ADMINISTRATIVE CYCLE OF ENTERPRISE AS RESERVE OF OVERCOMING OF THE PROBLEMATIC PHENOMENA UNDER PRESENT-DAY CONDITIONS

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**Abstract.** The article considers the dynamics of innovative activity of enterprises, describes the concept of “management cycle”, “segment, segmentation”, characterises the main segments in the management cycle mechanism. The authors present their vision of essential features of the concept of “innovation segment”, propose a conceptual model of the management cycle mechanism in the organization and an economic-mathematical model of innovation expectations with justification of expediency of its adaptation by an enterprise.

**Keywords:** innovation segment, management cycle, innovative idea, economic and mathematical model, management decision, innovation process, innovation management, innovation expectation, evaluation criterion.

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### Introduction

Enterprises under modern conditions suffer from a lack of innovative ideas allowing to reduce the level of production problems caused by economic problems in the country. The idea of innovations is not new, but it is not deprived of its relevance in both issues of improving the quality level of managerial mechanisms and the problems of assessing the performance of the business sector. Innovative developments adapting does not always correlates with the stated goal, because significant implementation periods can partially reduce the effectiveness of the planned result. Thus, it is clear that there is a need not only to find, develop and adapt innovative ideas, but to perform an ongoing work on the assessment and monitoring of the stages of innovation projects along with essential adjusting the values of the deviant criteria. The problem of evaluating the effectiveness of innovative changes in managerial mechanisms needs to be solved by introducing more realistic techniques including use of economic and mathematical modelling tools. Business sector in most cases uses econometric mathematical modelling tools partially, which creates a classical informational resource that hardly is substantiated by the value of individual criteria. The latter causes certain amount of error in the management decisions. Certainly, all the events in course of adapting the innovative idea cannot be predicted, but the use of mathematical modelling of a

situation can have a positive result. Consequently, the key problem aspect should be considered through the possibilities of adaptation of these economic instruments in the area of the idea formation with consideration of the the management mechanism chosen as the basis for its implementation.

The problems of implementation, assessment and management of innovation segments are monitored from the different points of view in the works of leading scientists and young researchers. A significant base is represented by monographic studies revealing various managerial aspects in the innovation sphere, but the use of economic and mathematical methods as tools for processing innovative evaluation criteria is quite limited. In addition, the applied aspects of the innovation segment in the management cycle of the enterprise are often considered as recommendatory while determining the level of the effect of introducing an innovative idea or evaluating the effectiveness of innovation projects, but there is no comprehensive view of the use of the evaluation tools in innovation cycle. The mentioned state of scientific research emphasizes the relevance of the chosen research subject.

In this context, the possible directions for improving the innovation process in the management mechanism should be regarded from the standpoint of evaluating selected criteria. These are measures for synthesizing the information flow for making managerial decisions. There is also a need to consider the concept of “innovation segment” and develop an economic-mathematical model of innovation expectation for modern enterprises as well as justify the expediency of its adaptation.

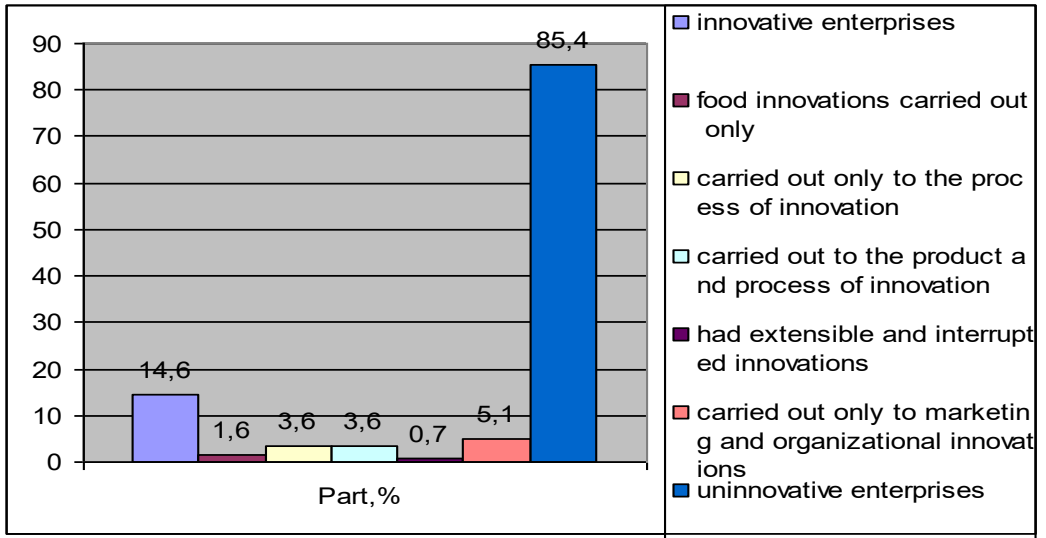
### **Results of the research**

The recent economy processes have significantly influenced the development of innovation systems in many countries around the world. Innovative policies of developed countries such as Great Britain, Germany, Italy, Canada, Japan are gradually being redirected from the formation of an exclusively innovative economy to the construction of a new innovative society. The expansion of the “new economy” according to M. Rogoza is based on intellectual capital, innovations, transformation processes. The key trends are the complication of the production processes; rise of the level of scientific knowledge for the output caused by a new turn of scientific and technological progress; development of the infrastructure, especially informational; shortening of the life cycle of new types of products, changes in consumer inquiries and emergence of new markets, etc. (*Rogoza, 2011*).

The intensity of globalization processes in the world economy requires Ukraine to respond to important economic challenges. Neglecting the problems of organization and stimulation of the development of the economy innovative component can lead to Ukraine’s inability to participate in shaping the main trends of reproduction of global markets of scientific and technological innovations and new technologies. According to L. Antoniuk, Ukraine can take its rightful place in Europe and the world in case of implementing the scientific and technological model of economic development forerun by the economic growth policy (*Antoniuk, 2003*).

During 2012-2017, the total share of enterprises engaged in innovation activity was 14.6%, including those implementing technological innovations – 9.5% (5.2% – food products and 7.2% – process); applying non-technological innovations – 8.6% (4.7% – organizational and 6.4% – marketing). On the opposite, the share of enterprises that did not innovate was 85.4% (Fig. 1). Non-innovation of enterprises does not necessarily involve the

lack of innovations or ideas to be competitive in the market. It rather relates to the conditions of poor investment climate for innovation within a country.



**Fig. 1. The share of enterprises engaged in innovative activities, according to the recommended types of economic activities**

Innovations in production were implemented in 85.2% of innovatively active enterprises including innovative types of products (47.8%) and innovative processes (60.9%).

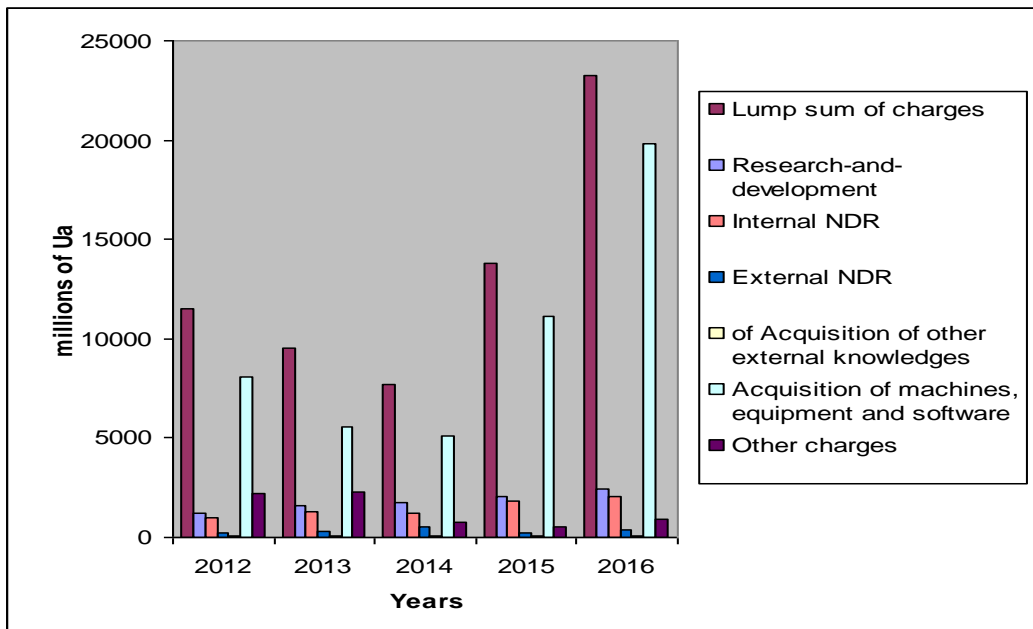
Ukrainian enterprises producing food products, beverages and tobacco products, textile manufacturing, clothing, leather goods and other materials, wood products, paper and printing, chemicals and chemicals, rubber and plastic products, other non-metallic mineral products are the most susceptible to innovations with the share of those engaged in innovations of 16.7-50%.

For example, in 2016, almost 52% of enterprises engaged in innovation activity sold innovative products for 242 million UAH, of which 21.4% were outside Ukraine (80.4 million UAH). The main share of enterprises (92.9%) sold products that were new exclusively for the enterprise. Its volume amounted to 201.1 million UAH, about 27% of the products were sold abroad. One in five enterprises sold products that were new for the market (40.9 million UAH), more than half of which were exported.

Fig.2. presents the dynamics of innovation activity of enterprises in different directions of innovation implementation.

The period of 2012-2016 is marked by a fluctuation of the total amount of expenses for the introduction of innovations. The least funds for innovation activity were invested in 2014, due to the crisis in the country's economy. The situation was gradually changing, and 2015 saw an increase in the total cost of innovation. In 2016, investment in innovation activities rose, connected with positive processes in the country's economy. An attention should be paid to the fact that during the period under review the largest investments were made in the purchase of machines, equipment and especially software. It's quite obvious since companies seek to be competitive in the market, and the purchase of new equipment and software

improves the technological process of manufacturing products and improves the quality of products. Minor part of investments is assigned for research and development, which confirms the long duration of the innovation process associated with research and development and the risk of a negative result. Enterprises are not inclined to spend money on acquiring other external knowledge. This phenomenon is temporary, until the owners of the enterprises come to understand that in a competitive environment, people with new ideas and knowledge will be of large value. In addition, the national report “Innovative Ukraine-2020”, initiated by the National Academy of Sciences of Ukraine (2015), draws attention to the need of creation of an innovative technology transfer network.



**Fig. 2. Innovative activity of enterprises in different directions of innovation implementation in 2012-2016**

Thus, the analysis of innovative activity of enterprises shows that there are problems both with the investment component, the process of introducing innovations and innovative management.

At present, domestic enterprises need new approaches to the formation of a management mechanism. The management mechanism includes a managing system and a managed one, both comprising well-defined components. The managing system encircles higher management that takes managerial decisions and is responsible for their effectiveness. In turn, the managed system is subordinated to the general management system at the enterprise. It is exposed to market regulation and limited by state regulation. From this position, innovation can be adapted by senior management in the management units considered to be the most promising.

The research has proved the fact that the management mechanism requires both strategic and tactical intervention. Strategic intervention is carried out through the development of planned prospects for the implementation of strategic business development

decisions. The tactical unit involves the phased implementation of the planned strategic prospects.

The senior management of a modern enterprise is to ensure the effectiveness of the management cycle mechanism.

It is reasonable to assume that the management mechanism of a modern enterprise is a system of key elements that regulate the management cycle in terms of planning, analysis and control over technical, economic, production and financial resources. The effectiveness of this management mechanism is achieved by means of interrelated elements: methods, levers, legal regulation, normative and informational support.

From another perspective, management mechanism can be understood as a system of principles and methods for the development and implementation of managerial decisions related to production, financial and socio-economic cycles, and ensure the efficiency and effectiveness of enterprises. In our opinion, this approach details the information flow on the content of management cycles and the purpose of their adaptation.

Considering the main aspects of management should be accompanied by addressing the innovation segment in the management cycle. As a rule, innovation management is viewed in terms of newly applied management procedures, measures, information system, organizational structure. P. Mykytiuk argues that innovation process is the process of creating, disseminating and implementing innovations that meet new social needs. According to the scientist, the innovation process consists of separate stages that differ in the organization of labour, management and financing (*Mykytiuk, 2006*). At the same time, O. Skibitskyi (2009), O. Yastremska and G. Vereshchagina (2010) hold that the innovative management is a complex mechanism of actions of the control system that creates favourable conditions for the innovation process and opportunities for introduction of innovations (*Skibitskyi, 2009; Yastremska, 2010*).

According to V. Vasylenko and V. Shmatko under conditions of constant changes in the economic rules of innovation processes, certain terms need to be interpreted for adjusting their content. The scientist suggests that the innovation management should be regarded as a set of procedures constituting a general management system which combines specialized units capable of fulfilling the tactical tasks set by the strategic rules of innovations adaptation (*Vasylenko, 2003*). N. Krasnokutska (2003) emphasizes that innovation management is to be regarded as a management system that actively influences entrepreneurial activity, its innovative and investment component development (*Krasnokutska, 2003*).

In our view, innovation activity is present in the management structure of an enterprise only when the strategic development of the enterprise includes an innovation segment in the management cycle. If it is absent, the company is not able to develop an effective management system based on the improvement of work without innovative measures. The analysis of the essence of the “management cycle” concept shows that the management cycle is a set of consistently implemented management operations enabling the subject of management to achieve the desired results. B. Kyiak believes that in the context of the priority of information and communication technologies based on the exchange of knowledge, the function of management should be carried out by organizations that purposefully convert the selected information into signals, which results in a management cycle. The final result of work of the system is analysis, information processing, purpose, solution, implementation, control, comparison of results (*Kyiak, 2009*).

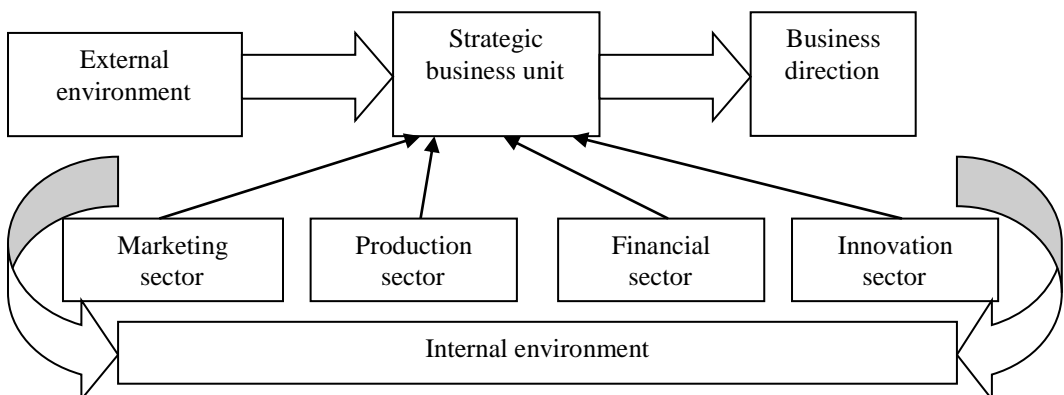
Analysis of the definitions of the concept of “segment”, “segmentation” shows that it refers to the marketing component and is used in the analysis of the external environment.

Segmentation refers to a process of bifurcating or dividing a large unit into various small units that have more or less similar or related characteristics. Market segmentation is the process of dividing a broad consumer or business market, usually consisting of existing and potential customers, into sub-groups of consumers (known as segments) based on some type of shared characteristics.

R.R. Varella, J. Frazão, A.V. Oliveira (2017) point out that the segmentation divides the demand into a segment. It is essential for keeping the community intact and reducing potential information overload (Varella, 2017). Another aspect of the concept of “segmentation” is presented within strategic management. According to N. Kudenko, the process of allocating strategic business units and business areas in an enterprise is regarded as the structuring of its activities (or strategic segmentation). The strategic business unit (SBU) is referred to as a separate zone of enterprise management responsible for a certain type of its business (market activity). A business unit can cover one important business department, several product groups, or even one type of product or brand produced by the company (Kudenko, 2002).

The management of each business unit is, to a certain extent, the management of the organization involving the fulfilment of production, marketing, financial functions, in particular those related to the development and implementation of innovations, etc. which results in the formation of business direction (Fig. 3). Fig. 3. presents the authors’ conceptual model of the management cycle of a strategic business unit. It confirms that only the joint work of marketing, production, financial and innovation sectors within the internal environment provides the maximum efficiency of the enterprise or strategic business unit. The formation of a business direction is the strategic goal of managing each business unit.

In our opinion, the innovation segment in the management cycle should become a compulsory development attribute for the modern enterprise in the future. The improvement of the production, economic, and financial sector of the enterprise is impossible without the innovative ideas. In addition, the innovation segment should ensure the development of appropriate measures, and, moreover, provide top management of the enterprise with tools to improve the work of the company in general and its parts in particular. These actions should be supplemented by development and implementation of criteria for evaluating the effectiveness of innovation activities.



**Fig. 3. Conceptual model of organization management cycle mechanism (SBU)**

Taking into account the foregoing, the authors' vision of the essential characteristic of the concept of "innovation segment" is proposed. We see it as a management tool for the development, implementation, diffusion of innovations aimed at improving the management cycle segment through the use of scientific methods, economics and mathematical modelling and IT technologies. In our opinion, clarification of the content of the concept of "innovation segment" provides an opportunity to define the link of the management cycle which needs to be improved through certain methods or tools.

On the basis of the results of the research, we offer an economic-mathematical model of innovation expectations for contemporary enterprises that hold the way of innovation development. It has its roots in a classic version of the development of an economic-mathematical model that considers innovative profit as a criterion of optimality. In this case, the equation of the target function can be presented as:

$$L_i = \sum ( \Pi_j \times X_j ) \times k_i \rightarrow \max,$$

Each component of the target function is responsible for a clearly defined segment. Thus ( $L_i$ ), the innovative profit is equal to the total of the planned amount of innovation profit ( $\Pi_j$ ) supposed to be received from the production of the  $j$ -type product unit, which is provided by the innovative project and the planned amount of produced innovative products ( $X_j$ ). The economic-mathematical model includes an adjustment coefficient ( $k_i$ ) determining the actual level of implementation of the criteria, i.e. the planned quantity according to the innovative project.

Certainly setting the tasks of mathematical programming involves taking into account the limited nature of resources invested in the innovative project and assumed to provide the planned volume of the innovative product. Therefore, we believe that the effectiveness of the proposed economic-mathematical model is achieved if the innovative project outlines the optimal size of the required volume of production, economic and financial resources.

According to the classical rules of constructing an economic-mathematical model, it is necessary to determine the system of inequalities which in our case includes the norm of the cost of production resource for the release of the  $j$ -type innovation product and stocks of a specific type of production resource for the period considered.

Resuming the foregoing, we believe that the proposed economic-mathematical model of innovation expectations, on the one hand, enables enterprises to obtain a sufficient level of realistic information flow in terms of implementation of planned innovation perspectives; on the other hand, the top management of the enterprise gains an opportunity to make timely corrections of the value of the criteria which do not meet the planned prospects. In addition, the qualitative level of the process of making management decisions in the field of innovation expectations of the enterprise increases, and as a result the level of performance of the planned innovation project also significantly increases.

## Conclusions

On the basis of the results of the scientific research, a number of conclusions can be drawn. First, innovative instruments and regulators should become the basis for the development of modern enterprise management mechanisms, because the complex economic conditions of their functioning give rise to a number of issues that are subject to immediate resolution through the adoption of sound, relevant, qualitative and innovative solutions.

Secondly, the development of an effective mechanism for managing an enterprise should be based on the correct understanding of the essential content of the concept. This approach provides that all components of the management cycle mechanism are taken into account and contribute to the timely adoption of the basic management decision. Thirdly, the involvement of the innovation segment is possible provided that the company understands its essential content and combines it with the managerial processes. Fourth, the effectiveness of innovative processes is possible under conditions of adaptation of the methods of economic and mathematical modelling, namely, the introduction of a mathematical model of innovation expectations which deepens the process of determining the value of innovation profit, and as a consequence, contributes to increasing the effectiveness of the formation process of the information flow for the adoption of balanced, sufficiently meaningful managerial solutions.

The highlighted problems are the basis for further research in the area of innovative segments adaptation at modern enterprise, especially from the standpoint of monitoring elements able to provide supervision and control over the various stages of development and implementation of innovative projects in the future.

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