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Organisational and economic mechanism of business entities' innovative development management

Abstract. *Introduction.* One of the problems of Ukrainian enterprises' innovative development ensuring is lack of effective innovative development management. *Purpose.* To form the organisational and economic mechanism of the innovative development management, and to develop scientific and methodical approach to evaluating the efficiency of the innovative development management. *Results.* We proposed a structure of the organisational and economic mechanism, a distinctive characteristic of which is the composition of the interaction process of the subjects and objects of management. As the subjects of management in the mechanism we singled out three subsystems: functional, process and administrative which are the bases of innovative development. The object of management is subprocesses of innovative development. In addition, the structures of subprocesses of the organisational and economic mechanism of the entities' innovative development management are formed in this article. Also, we proposed the indicators of efficiency to manage them. The scientific and methodical approach to evaluate the efficiency of the entities' innovative development management allows considering the impact of science and technology, resource, economic, financial and social types of effect. The basis of our research is six enterprises of information and telecommunications field of Ukraine. On the basis of the assessment, we can make companies' grouping by the level of innovative development, provide the characteristic of the current state, and form proposals for improving innovation strategy. The results of efficiency evaluation of the innovative development management of the studied enterprises in 2012-2016 have shown that LLC «Telsvit», LLC «Mehalink», LLC «ISP Riad», LLC «Promtel» belong to the group with average level of development. The enterprises should strengthen the innovative potential through the development of production capacity, improvement of management practices, and sustainable use of resources. LLC «Laynkord» and LLC «Kvazar Mikro Radio» achieve high level of innovative development within the implementation of a developed organisational and economic mechanism. They are advised to improve assimilated products and technologies to maintain competitive advantage.

Conclusion. Proposed organisational and economic mechanism of innovative development management, allows us to take into account functional relationship between all management elements. As a result of the research, it is found that the process of innovative development management should be considered as a set of subprocesses reflecting the combination of the main stages of the innovation life-cycle. We proposed scientific and methodical approach to evaluate the efficiency of the entities' innovative development management, assess their level of innovation and generate proposals for innovation strategy adjustment.

Keywords: Mechanism; Innovative Development; Innovation Management; Efficiency; Telecommunication and information industry; Index

JEL Classification: O10; O31; O32

DOI: <https://doi.org/10.21003/ea.V165-17>

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Організаційно-економічний механізм управління інноваційним розвитком суб'єктів підприємництва

Анотація. У статті розроблено структуру організаційно-економічного механізму управління інноваційним розвитком суб'єктів підприємництва. Обґрунтовано, що процес управління інноваційним розвитком слід розглядати як сукупність серії підпроцесів, що відображають поєднання основних етапів життєвого циклу інновацій. Запропоновано науково-методичний підхід до оцінки ефективності управління інноваційним розвитком суб'єктів підприємництва.

Ключові слова: механізм; інноваційний розвиток; управління; ефективність; підприємство.

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Организационно-экономический механизм управления инновационным развитием субъектов предпринимательства

Аннотация. В статье разработана структура организационно-экономического механизма управления инновационным развитием субъектов предпринимательства. Обосновано, что процесс управления инновационным развитием следует рассматривать как совокупность серии подпроцессов, которые отражают сочетание основных этапов жизненного цикла инноваций. Предложено научно-методический подход к оценке эффективности управления инновационным развитием субъектов предпринимательства.

Ключевые слова: механизм; инновационное развитие; управление; эффективность; предприятие.

1. Introduction

The economic development of the country depends on the intensity and quality of domestic enterprises' modernisation. It should be noted that in the present conditions of the innovative economic model formation, effective development of domestic enterprises takes place through the continuous introduction of innovative transformation of their elements [1]. The development of the national economy and increase of domestic enterprises' competitiveness are associated with the transition to the innovative model of economic development which includes a high concentration of knowledge and technology [2]. Currently, there are several problems in order to ensure the innovative development of the domestic enterprises. One of them is lack of effective mechanisms of innovation management. Innovations implementation provides not only economic growth of business entities, but also strengthens both financial stability and safety of the country. In such circumstances, the problem of organisational and economic mechanism formation of innovative development management has significant relevance.

2. Brief Literature Review

It is well-known that strategy of innovation is the driving force of economic growth [3, p. 14]. In particular, a number of researchers associate organisational success of the enterprise with the systematic introduction of innovation [4, p. 206]. Modern researchers focus on such criteria of the innovation efficiency as leadership, process management, relationships with suppliers, customer orientation, strategic planning, etc. Regardless of the sectoral affiliation, positive connection between the innovation indicators of the enterprise and the efficiency of its development has been established [5, p. 26].

In addition, a conceptual model of innovation management has been developed that structures the process of introducing innovative developments and allows us to effectively manage the innovative development of the enterprise in accordance with the requirements of modern realities [6, p. 179]. An analysis of modern studies suggests that the efficiency of innovation development of the enterprise is due to the influence of uncertainty in the business environment, size of the enterprise, the amount of financial resources, organisational culture, etc [7, p. 108]. However, depending on the specifics of functioning, there are other factors that influence or restrain the innovative development of the enterprise. In addition, depending on the conditions of the individual enterprise's functioning, it is necessary to form a system of indicators for assessing the efficiency of innovation development management, which is currently insufficiently investigated.

3. Purpose of the article is to form and justify the organisational and economic mechanism of business entities' innovative development management and to develop scientific and methodical approach to evaluate the efficiency of the entities' innovative development management.

4. Results

The implementation of the modernisation course is impossible without the formation of high-tech sector and the innovative ideas implementation in all the regions of the country [8, p. 1424]. Forming the organisational and economic mechanism of innovation management, it is appropriate to apply the system approach. Management is an integral part of any activity that requires coordination in different degree [9].

The structure of the proposed organisational and economic mechanism of the business entities' innovative development is shown in Figure 1. A distinctive feature of the proposed mechanism is the composition of interaction process of subjects and objects of management. There are three subsystems as management subject in mechanism such as functional, process and management that are the basis of the process of innovative business entities development. The object of the management is subprocesses. The structure of mechanism's functions includes analysis, normalisation, accounting, forecasting, organisation, control, regulation and coordination. These management functions comprehensively and purposefully intend to apply to the entire spectrum of administrative actions, regardless of property management and share in the activities of managers at different levels. The implementation of mechanism functions is carried out by means of management. As leverage innovative development was defined as the system of innovative indicators of the enterprises' capacity, in particular, expenditure, personnel, length of development and innovation.

The problems of efficiency increasing of the domestic enterprises' innovative development more often occur as a result of numerous external factors. Therefore, forming the mechanism of the companies' innovative development management, it is necessary to define which economic, political, technological, social and other factors have an impact on the enterprise as a part of an innovative component of the enterprise's functioning [10, p. 49]. The relationship of organisational and economic mechanism elements is key, because it connects all of its components and formalises the process of the mechanism functioning - from setting goals, through the relationship between the subject and object of management, providing the mechanism, the process characteristics of innovative development, the tools

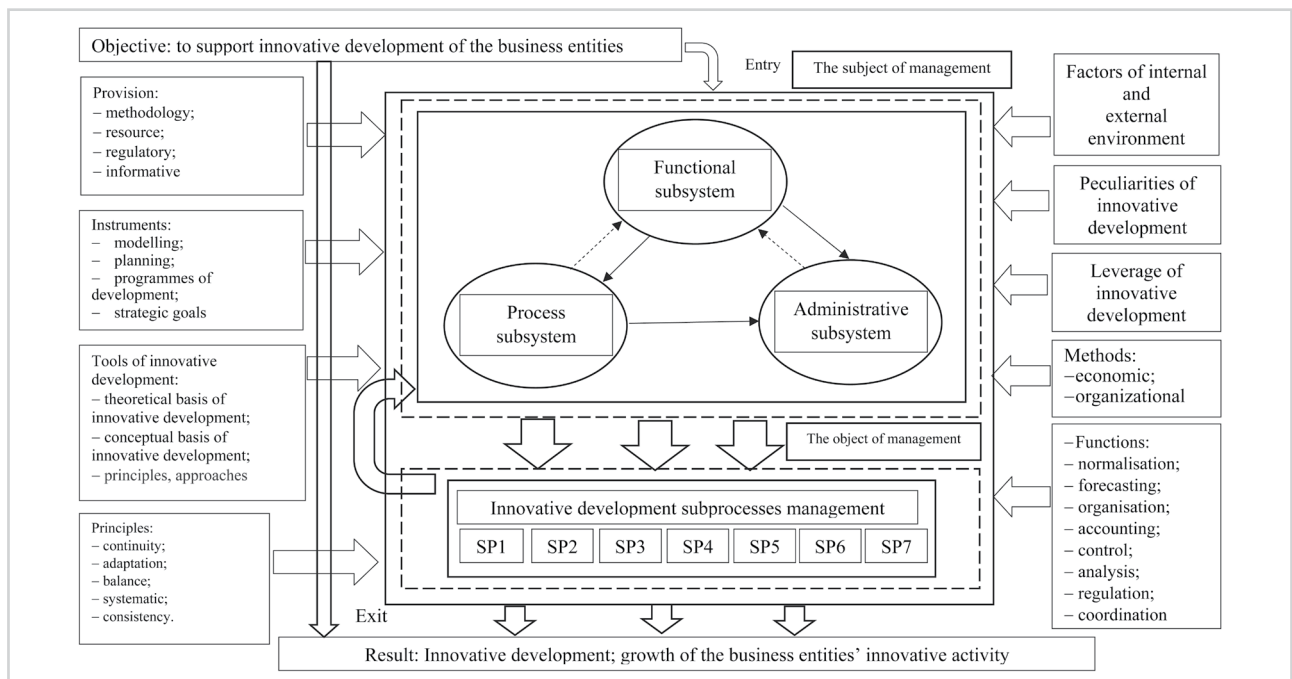


Fig. 1: Structure of organisational and economic mechanism of the business entities' innovative development management
Source: Compiled by the authors

to get the results and compare them with the purpose in the output.

The offered structure of the organisational and economic mechanism of the business entities' innovative development management allows us to achieve the goal of innovative development of the individual elements within the overall development strategy, to ensure the actual implementation of the innovations developed and coordinate the work of all the elements of the mechanism in order to enhance the innovative activity of the business entities. One of the most important elements of the organisational and economic mechanism of the entities' innovative development management is subprocesses of management. In other words, the process of innovative development management is considered as a set of subprocesses' series. Hence, it should be defined what problems will be resolved within the framework of each subprocess of the innovative development management (Table. 1).

Thus, subprocesses of the innovative development management reflect the combination of the main stages of the innovation life-cycle, each of which occupies a certain place and has the value in it; all of them are interrelated and complementary. The basis of our research is the enterprises of information and telecommunications field of Ukraine. On the basis of the received information, we calculated the indices of efficiency of innovative development management. Considering that the studied parameters have different dimension, it is necessary to bring them to a dimensionless form - a single interval of measurement based on valuation.

The standardisation was carried out by rate maximising. The normalised index we define as the ratio of the calculated absolute average value of the i -th index to the best absolute average value of this index in the analysed group of enterprises:

$$Q_{in} = \frac{\bar{Q}_i}{Q_{IB}} \quad (1)$$

where Q_{in} - the normalised i -th index;

\bar{Q}_i - the average value of the i -th index for the analysed period;

Q_{IB} - the best average value of the i -th index in the analysed group of enterprises for the analysed period.

We determined the weight coefficients of indicators by the method of peer review, as a result of the industry innovative features research. The calculation of the integral index of enterprise's innovative development was carried out using average normalised values of indices for the analysed period and weighting coefficients by the formula:

$$IR = \sum_n^{i=1} V_i * Q_{in} \quad (2)$$

where IR - the integral index of enterprise's innovative development;

V_i - the weight of i -th index.

Enterprises activities are analysed in terms of efficiency of their innovative development with the introduction of a developed organisational and economic mechanism during 2012-2016. On this basis, we determine the reference values for the integral index of innovative development. Thus, if the integral index $IR \geq 0.1$, the enterprise has average and high level of innovative development; if $0.1 \leq IR < 0.5$, the enterprise has an average level of innovative development; if $IR \geq 0.5$, an average level of innovative development is high; if $IR < 0.1$, the enterprise has low level of innovative development. Depending on the level of innovative development, we formulate the characteristics of the current state of the enterprise and recommend creating innovative management of corrective or supportive nature. We can group companies according to the level of innovative development, provide the characteristic of the current state, and form proposals for improving the innovative strategy based on the assessment (Table 2).

The results of efficiency evaluation of the innovative development management of the studied enterprises of the telecommunication and information industry of Ukraine in 2012-2016 are presented in Table 3.

Thus, as a result of efficiency evaluation of innovative development management of the enterprises LLC «Telsvit», LLC «Mehalink», LLC «ISP Riad», LLC «Promtel» are referred to the group with average level of development. These enterprises should strengthen the innovative potential through the development of production capacity, improvement of management practices, and sustainable use of resources.

The enterprises LLC «Laynkord» and LLC «Kvazar Mikro Radio» achieve a high level of innovative development within the implementation of a developed organisational and economic mechanism. Hence, based on the results of efficiency evaluation of the innovative development management, these enterprises need to improve assimilated products and technologies to maintain competitive advantage.

5. Conclusion

Thus organisational and economic mechanism of the business entities' innovative development management is a system of tools, methods, functions and principles of management process which are used in the practice of business entities. The developed organisational and economic mechanism of innovative development management allows taking into account functional relationships among all the elements of

Tab. 1: The composition of subprocesses of the organisational and economic mechanism of the business entities' innovative development management and their efficiency indicators

Subprocess of the innovative development management	Tasks of the subprocess of the innovative development management	Expected effect	Index of efficiency
Innovation demand management (SS1)	Defining the internal needs in innovations and working out the request for innovations on the basis of strategic goals of enterprise's development.	Scientific and Technical	IS; NT
Innovation acquisition management (SS2)	Organisation of cooperation with domestic and foreign research and development organisations. The research of innovation market.	Resource and Social	MR; P
Innovation ideas management (SS3)	Information gathering to solve the problem (search and generation of ideas). Selecting the most perspective ideas. Ideas modification to the stage of applied research.	Scientific and Technical;	IS; NT;
Applied research management (SS4)	Defining the objectives of the study. Research planning and organisation. Conducting the research. Analysis of the results.	Economic; Social	NP; P
Research work management (SS5)	Formation of innovative ideas. Analysis of business opportunities. Evaluating the efficiency and risks of innovative projects. Project implementation. Economic indicators monitoring. Testing.		
Innovation implementation management (SS6)	The choice of work organisation form. Organisation and control of the terms and spendings. Placing the product / service in the market.	Economic; Financial	NP; IP
Innovation potential management (SS7)	1. Information gathering about the state of innovation potential components. 2. Defining methods and indicators to assess the innovative development capacity; 3. Estimation and analysis of innovative potential. 4. Identifying problems and opportunities for the development of innovative potential. 5. Business opportunities research. 6. Working out the measures for innovative potential development. 7. Evaluating the efficiency of developed measures implementation.	Resource; Economic; Financial	MR; NP; IP

Designation: IS - provision of intellectual property; MR - material resources; NT - new technology development; NP - new products development; P - staff engaged in research work; IP - amount of investment in innovation projects.
Source: Compiled by the authors based on [11-13]

Tab. 2: Enterprises' grouping according to the level of innovative development

Characteristics	Group		
	The value of integral index of enterprise innovative development		
	IR < 0,1 – low	0,1 ≤ IR < 0,5 – average	IR ≥ 0,5 – high
1. Moderate part of staff involved in the research work. 2. Average level of new technologies and equipment introduction. 3. Low proportion of new products developing and required resources for their manufacture in the total volume of production. 4. Low level of intellectual property provision. 5. Very low level of innovative projects funding.	1. Moderate part of staff involved in the research work. 2. High level of new technologies and equipment introduction. 3. Low proportion of new products developing and required resources for their manufacture in the total volume of production. 4. Average level of intellectual property provision. 5. Moderate level of innovative projects funding.	1. Moderate part of staff involved in research work. 2. High level of new technologies and equipment introduction. 3. Average proportion of new products developing and required resources for their manufacture in the total volume of production. 4. High level of intellectual property provision. 5. High level of innovative projects funding.	
Searching for ways of innovative activities development: - sustainable use of resources; - increase the efficiency of HR potential usage; - improving the quality of research work; - improvement of assimilated products and technologies; - new products and processes development.	Capacity building-up via: - sustainable use of resources; - increase the efficiency of HR potential usage; - development of production capacities and innovative projects implementation; - new products and processes creation and usage; - increasing amounts of the intellectual property objects.	Position maintenance through: - staff motivation and encouraging its effective work; - increasing the information potential; - improvement of assimilated products and technologies; - encouraging new products and processes development; - providing competitive advantages.	

Source: Compiled by the authors based on [14-15]

control; ensures efficient use of available resources; optimises work and minimises the risks associated with its implementation for the growth of the business entities' innovative activity.

As a result of the research, it is determined that the process of innovative development management should be viewed as a set of series of sub-processes that reflect the combination of the main stages of innovation life-cycle. Depending on the goals and objectives of each subprocess, we determined performance indicators of innovative development management within the proper effect. The developed scientific and methodical approach to evaluate the efficiency of the entities' innovative development management allows us to consider the impact of scientific and technological, resource, economic, financial and social types of effects, assess the level of innovative development and create proposals for adjustments of the business entities' innovative strategies.

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Tab. 3: The results of efficiency evaluation of the innovative development management of the telecommunication and information industry enterprises in 2012-2016

		IS	MR	NT	NP	P	IP
LLC «Telsvit»	2012	0.204	0.325	0.154	0.164	0.315	0.742
	2013	0.402	0.125	0.311	0.197	0.374	0.731
	2014	0.314	0.247	0.315	0.194	0.317	0.745
	2015	0.417	0.248	0.157	0.190	0.314	0.764
	2016	0.149	0.648	0.541	0.185	0.310	0.721
	Q_m	0.690	0.727	0.348	0.393	0.529	0.877
$IR = 0.271$							
LLC «Mehalink»	2012	0.240	0.358	0.214	0.147	0.314	0.721
	2013	0.412	0.147	0.374	0.214	0.374	0.614
	2014	0.574	0.258	0.168	0.297	0.415	0.640
	2015	0.614	0.159	0.614	0.284	0.484	0.682
	2016	0.295	0.346	0.184	0.215	0.491	0.712
	Q_m	0.990	0.579	0.366	0.489	0.674	0.798
$IR = 0.241$							
LLC «ISP Riad»	2012	0.124	0.241	0.614	0.125	0.210	0.694
	2013	0.341	0.315	0.841	0.127	0.231	0.674
	2014	0.129	0.184	0.912	0.137	0.240	0.624
	2015	0.187	0.257	0.941	0.157	0.201	0.620
	2016	0.412	0.345	0.942	0.174	0.212	0.651
	Q_m	0.554	0.613	1	0.304	0.355	0.773
$IR = 0.329$							
LLC «Promtelet»	2012	0.247	0.321	0.413	0.410	0.610	0.852
	2013	0.348	0.244	0.419	0.419	0.621	0.841
	2014	0.412	0.315	0.512	0.512	0.627	0.853
	2015	0.374	0.274	0.571	0.510	0.613	0.810
	2016	0.185	0.619	0.482	0.515	0.614	0.864
	Q_m	0.727	0.810	0.564	1	1	1
$IR = 0.304$							
LLC «Laynkord»	2012	0.274	0.316	0.122	0.184	0.149	0.827
	2013	0.612	0.318	0.147	0.415	0.164	0.831
	2014	0.278	0.491	0.157	0.454	0.191	0.614
	2015	0.412	0.319	0.164	0.415	0.175	0.652
	2016	0.579	0.746	0.147	0.491	0.164	0.640
	Q_m	1	1	0.173	0.828	0.273	0.845
$IR = 0.692$							
LLC «Kvazar Mikro Radio»	2012	0.147	0.194	0.194	0.156	0.271	0.651
	2013	0.284	0.379	0.614	0.164	0.293	0.472
	2014	0.348	0.167	0.667	0.174	0.288	0.431
	2015	0.147	0.319	0.648	0.192	0.246	0.512
	2016	0.215	0.274	0.621	0.181	0.253	0.572
	Q_m	0.529	0.609	0.647	0.366	0.438	0.625
$IR = 0.519$							

Source: Calculated by the authors

Received 4.06.2017