

Marta Kopytko, Zinaida Zhyvko, Halyna Levkiv

Lviv State University of Internal Affairs

Competitiveness and security of innovative-active enterprises

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Abstract

Based on the analysis of the level of innovation activity of enterprises in Ukraine and the factors of influence on its indicators, the main factors determining the negative dynamics of the development of innovation activity of enterprises in Ukraine are determined. In order to overcome the problems in the field of innovation, it is proposed to focus on the implementation of innovative management in the process of implementing innovative processes. For this purpose, recommendations for the organization of the process of innovation management, taking into account the successful practice of foreign enterprises, have been developed.

Keywords: innovation, innovation activity, innovation process, innovation management, innovation potential, threats and risks, enterprise competitiveness, enterprise security, factors influencing the activity of innovation activity.

The level of innovation activity in the Ukrainian economy is low. This is evidenced by the data of competent ratings. Such, according to the European Innovation Scoreboard of the European Innovation Scoreboard, in 2016 Ukraine was in the last group of innovations (the fourth “Modest Innovators”) with the index value of 0.1889 (the maximum possible value = 1). Ukraine surpassed only Macedonia — 0.1636 and Turkey — 0.1880. The leading European countries-leaders include Sweden — 0.796 (first group “Leaders of Innovation”), Sweden — 0.5843 (second group “Strong Innovators”), Estonia — 0.4161 (third group “Moderate Innovators”). Accordingly, the lag behind the analyzed group

leaders ranges from 1.6 to 4 times. In 2016, the value of Ukraine in the European Innovation Index increased in comparison with 2015 (0.1783) [1].

The rating of the international agency Bloomberg Rankings confirms the low position of Ukraine on the level of innovation activity. According to this rating Ukraine in 2016 among 50 countries ranked 41st in terms of innovation (a total score of 56.77 out of 100). Only Malta, Bulgaria, Serbia, India, Tunisia, Morocco, Argentina and Kazakhstan demonstrated lower positions. The top ranking was South Korea (91.31), Germany second (85.54), Sweden third (85.21) [2]. According to the Global Institutional Index (Global Innovation Index 2018) of the World Intellectual Property Organization (WIPO) according to the rating on innovation in the country at the level of GDP, Ukraine was attributed to countries with incomes below the average and took 43th place among 126 countries, which is 7 positions better than in 2017 [3]. Headed the rating of Switzerland. Among the leading innovation countries: the Netherlands, Sweden, the United Kingdom, Singapore, the USA, Finland, Denmark, Germany, Israel, South Korea, France, Japan, Canada, Australia [4].

The fact that the level of its financing is extremely low compared to the EU countries is shown by the crisis in innovation activity in Ukraine (Table 1).

According to the world practice, depending on the share of GDP allocated for scientific research, science can perform an economic function in a country only if the indicator of GDP intensity exceeds the 0.9% mark [5]. In Ukraine, this figure is twice lower in 2017, indicating significant gaps in the field of scientific activity support.

Table 1. Share of expenditures on implementation of GDRs in GDP in the EU and Ukraine in 2005–2016, Percent of GDP

Countries	Years							
	2005	2010	2011	2012	2013	2014	2015	2016
EU-28	1.74	1.93	1.97	2.01	2.02	2.03	2.03	2.03
Germany	2.42	2.71	2.80	2.87	2.82	2.87	2.92	2.94
Slovenia	1.49	2.06	2.42	2.57	2.58	2.37	2.20	2.00
Czech Republic	1.17	1.34	1.56	1.78	1.90	1.97	1.93	1.68
Estonia	0.92	1.58	2.31	2.12	1.72	1.45	1.49	1.28
Hungary	0.92	1.14	1.19	1.26	1.39	1.35	1.36	1.21
Spain	1.10	1.35	1.33	1.29	1.27	1.24	1.22	1.19
Poland	0.56	0.72	0.75	0.88	0.87	0.94	1.00	0.97
Slovakia	0.49	0.62	0.66	0.80	0.82	0.88	1.18	0.79
Bulgaria	0.45	0.56	0.53	0.60	0.63	0.79	0.96	0.78
Lithuania	0.75	0.78	0.90	0.89	0.95	1.03	1.04	0.74

Countries	Years							
	2005	2010	2011	2012	2013	2014	2015	2016
Romania	0.41	0.45	0.49	0.48	0.39	0.38	0.49	0.48
Latvia	0.53	0.61	0.70	0.66	0.61	0.69	0.63	0.44
Ukraine*		0.75	0.65	0.67	0.70	0.60	0.55	0.48

* Note: the specific weight of expenditures for the implementation of the GDR in Ukraine in 2017 was 0.45

Source: Lyashenko O.M. *Effectiveness of budget financing of scientific research in Ukraine*. Retrieved from: http://www.niss.gov.ua/content/articles/files/biudzheth_fin-58b32.pdf.

The level of economic development of any state depends on the development of the business sector. The efficiency of enterprise activity is significantly increasing in the case of innovation. Ukraine's economy has significantly lost its position on the international scene during 2014–2017. This was aided by the systemic crisis, which caused significant problems in the financial environment and social sphere. The level of innovative activity of enterprises has declined dramatically and in connection with the fact that the level of inflation (Figure 1) has increased, compared with 2004, by more than 372%. Problems in the financial sector have affected the level of GDP of Ukraine (Table 2).

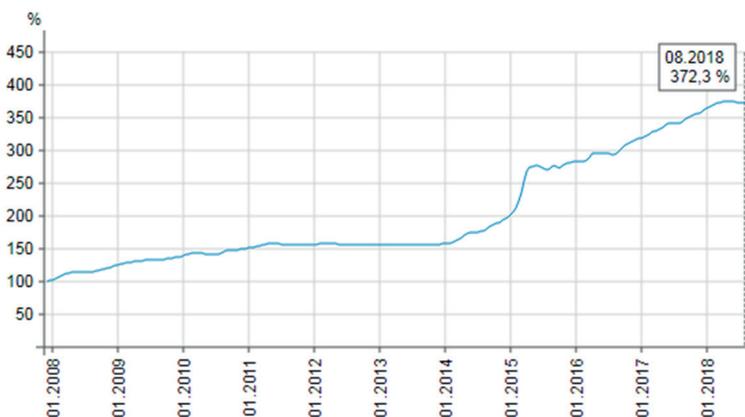


Fig. 1. The level of inflation in Ukraine for 2008–2018

Source: Inflation rate. Retrieved from: <https://index.minfin.com.ua/economy/index/inflation/>.

Table 2. GDP level of Ukraine for 2002–2016

Years	Million dollars USA		Percent of GDP
2002	42,393		
2003	50,133	7,740	18.3%

Years	Million dollars USA		Percent of GDP
2004	64,883	14,750	29.4%
2005	86,142	21,259	32.8%
2006	107,753	21,611	25.1%
2007	142,719	34,966	32.5%
2008	179,992	37,273	26.1%
2009	117,228	-62,765	-34.9%
2010	136,419	19,192	16.4%
2011	163,160	26,740	19.6%
2012	175,781	12,622	7.7%
2013	183,310	7,529	4.3%
2014	131,805	-51,505	-28.1%
2015	90,615	-41,190	-31.3%
2016	93,270	2,655	2.9%

Source: Nominal GDP of Ukraine from 2002 to 2018. Retrieved from: <https://index.minfin.com.ua/economy/gdp/>.

By the level of GDP Ukraine, by 2016, showed lower indicators than in 2006. Even the global financial crisis of 2008 did not have such a negative impact on the level of Ukraine's GDP as the events of 2014 and, in particular, the annexation of Crimea and the beginning of military confrontation in the east of Ukraine.

The level of innovation activity of enterprises in 2016 was practically equal to the indicator of 2008. This testifies that over the course of 8 years the Ukrainian economy has not shown a positive tendency to strengthen its positions in the global economy.

Analyzing the level of innovation activity of Ukrainian enterprises (Table 3), we can observe a drop in the level of innovation-active enterprises in 2016 compared to 2010. In 2016 18.4% of enterprises engaged in innovation activity, while in 2010 — 21%. The level of 2016 is only 0.4% higher than the 2008 level. The catastrophic level of innovation activity demonstrates indicators of food innovation, whose value dropped from 7.5% in 2008 to 1.2% in 2016. This indicates that that the overwhelming majority of enterprises in Ukraine turned down innovative activity or reduced the pace of its implementation.

Taking into account the above-mentioned tendencies of innovation activity by enterprises in Ukraine, the problem of research of this sphere with the development of recommendations for improvement of the situation is actualized.

Table 3. Dynamics of innovation-active enterprises by types of innovation activity

Indexes	Years		
	2008	2010	2016
Total number of enterprises and organizations	100.0	100.0	100.0
Innovative-active	18.0	21.0	18.4
They were engaged in technological innovations	11.6	9.8	4.5
They were engaged in product innovations	7.5	5.8	1.2
They were engaged in process innovations	8.4	7.6	5.8
They were engaged in marketing innovations	10.5	12.5	5.1
Engaged in organizational innovation	8.1	10.2	
Did not do any of the innovations	82.0	79.0	81.6

Source: author's development on the basis of: Investigation of innovation activity in the economy of Ukraine. Retrieved from: <http://www.ukrstat.gov.ua>.

As stated in the monograph [9], the main factors that determine the negative dynamics of the development of innovation activity of enterprises in Ukraine are:

- lack of funding sources and high risks;
- focus on short-term payback;
- insufficient number of scientific and innovative organizational structures;
- insufficient volume of international scientific and technical programs and cooperation projects;
- imperfect legislative base regulating the sphere of innovation activity;
- resistance to changes, which leads to a change in status;
- insufficient professional level of employees of the innovation sphere, imperfect system of motivation and stimulation of creative work;
- departure of scientific workers [9, p. 192.];
- the negative impact of the military conflict in Ukraine.

We focus on the study of the features of innovation in order to formulate recommendations for Ukrainian enterprises that would allow to intensify innovation activity and thereby achieve a high level of competitiveness and provide an adequate level of economic security.

Before concentrating on the efforts of enterprises to intensify innovation, it is necessary to clearly understand what innovation, innovation and innovation are (Fig. 2). So, innovation is the ultimate result of innovation and involves the withdrawal of its own development on the market.

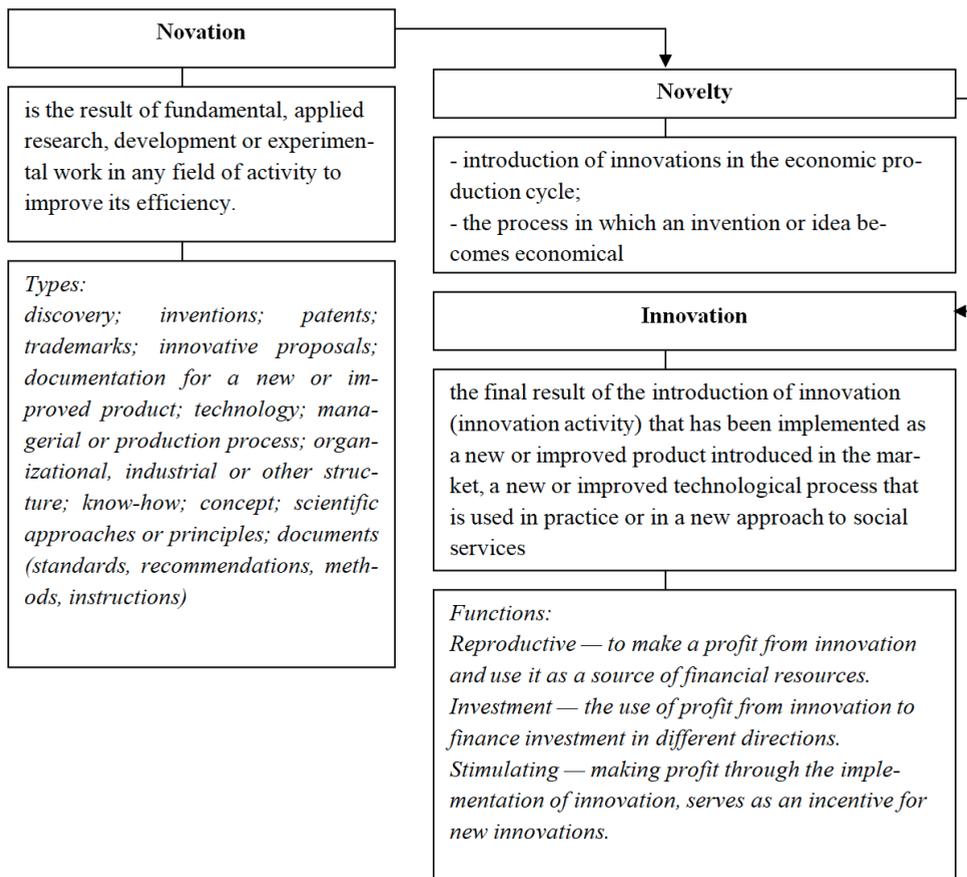


Fig. 2. Concept of innovations, innovations and innovations

For the success of the implementation of innovative products it is advisable to take into account the structure of the sphere of innovation activity (Fig. 3).

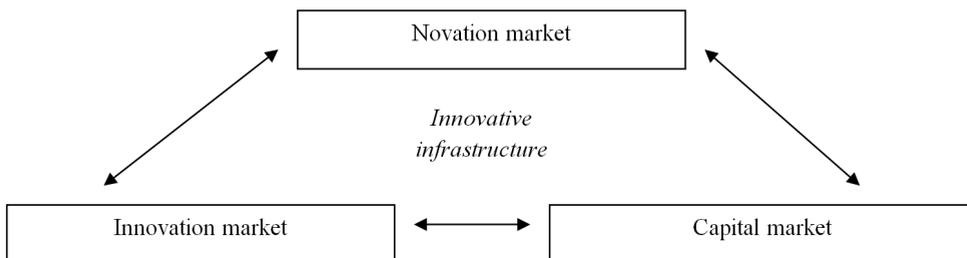


Fig. 3. Scope of innovation activity

Source: Essential characteristic of innovations and innovative processes. Retrieved from: <http://elib.lutsk-ntu.com.ua/book/fb/pesp/2012/12-40/page5.html>.

The market for innovations involves trade that has not yet been launched on the market for a wide range of consumers of innovative products or services; it involves cooperation between producers. The capital market characterizes the cooperation between investors and innovators. Instead, the innovation market is universal and allows cooperation as innovators, investors and intermediaries, and so on.

For the effectiveness of innovation activities, it is advisable for Ukrainian enterprises to focus their own efforts on certain innovative projects, since the overwhelming majority of innovation-active enterprises do not have large financial resources to diversify innovation activity. Therefore, it is necessary, first of all, to define the sphere of innovation activity:

- product innovations;
- innovations in technological processes;
- staff innovation;
- innovation management activities;
- innovation in culture [11].

In Fig. 4 the approaches to the understanding of innovation activity, the feature of which is the emphasis on the result, which manifests itself in obtaining additional competitive advantages and keeping (obtaining) the leading positions in the market. It is the use of new technologies or products/services that allows the business entity to move to a new level and gain additional competitive advantages. Such competitive advantages will help to improve the investment attractiveness and create additional opportunities for raising funds. In addition, the consumer value of products or services will improve, and this will expand the range of consumers and thus expand the marketing market. An important part of the enterprise is the choice of types of innovative activity and ways of its organization.

In order to increase the efficiency of innovation activity, it is advisable to diversify it, that it will be possible to develop a new type of product, create a new service, offer consumers a new approach to product sales, improve production processes and equipment that will better fulfill their functions, use the latest organizational and technical solutions that will promote better regulation of production, etc.

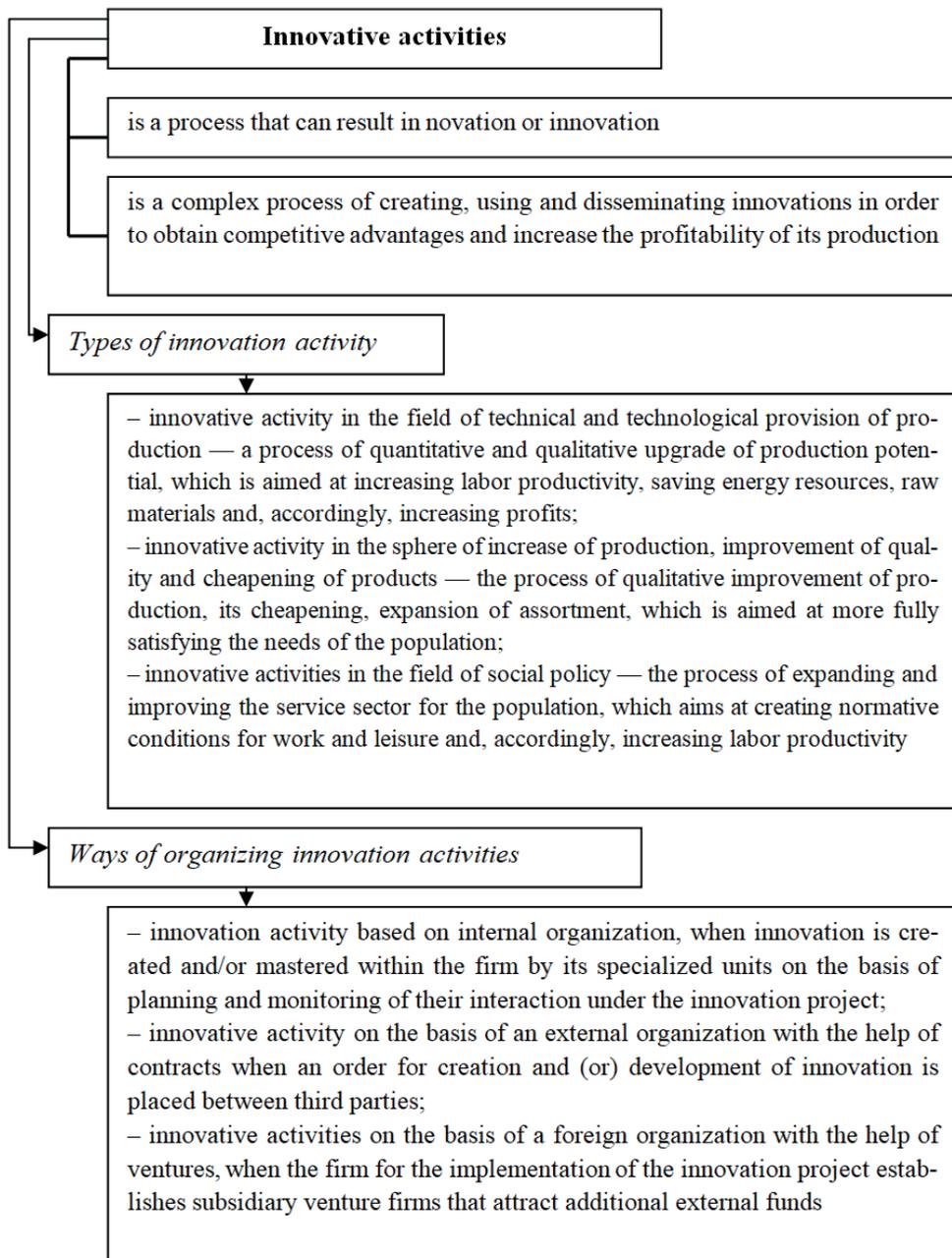


Fig. 4. Concepts, types and methods of organization of innovation activity

The list of objects of innovation can be attributed:

- innovative programs and projects;
- new knowledge and intelligent products;
- production equipment and processes;

- infrastructure of production and entrepreneurship;
- organizational and technical decisions of an industrial, administrative, commercial or other nature that significantly improve the structure and quality of production and (or) social sphere;
- raw materials, means of their extraction and processing;
- commodity products;
- mechanisms of formation of the consumer market and marketing of commodity products.

Important for the formation of a high level of competitiveness of the innovation-active enterprise is its innovative potential, which is understood as the totality of all available tangible and intangible assets of the enterprise used in the process of innovation [13, p. 13]. Innovation potential of the enterprise is formed on the basis of the aggregate of indicators:

1. Group 1:

- Cost of main production assets of industrial purpose.
- Patent-licensing activity.
- Implementation of progressive technological processes.
- Introduction of new types of products.
- The volume of high-tech products.
- The effect of the use of inventions and innovative proposals.
- Expenses of the enterprise for innovation activity.
- Cost-effectiveness of production.

2. Group 2:

- Professional level of the personnel of the enterprise.
- Organizational structure of enterprise management.
- Technical level of development.
- The level of depreciation of the main industrial assets of industrial use.
- Financial condition of the enterprise [12].

Only a clear assessment of these parameters will allow an adequate assessment of the innovative potential and determine the future success of innovation, which will be a determining factor in ensuring economic security.

The management of innovation activities falls under the scope of innovation management (Fig. 5).

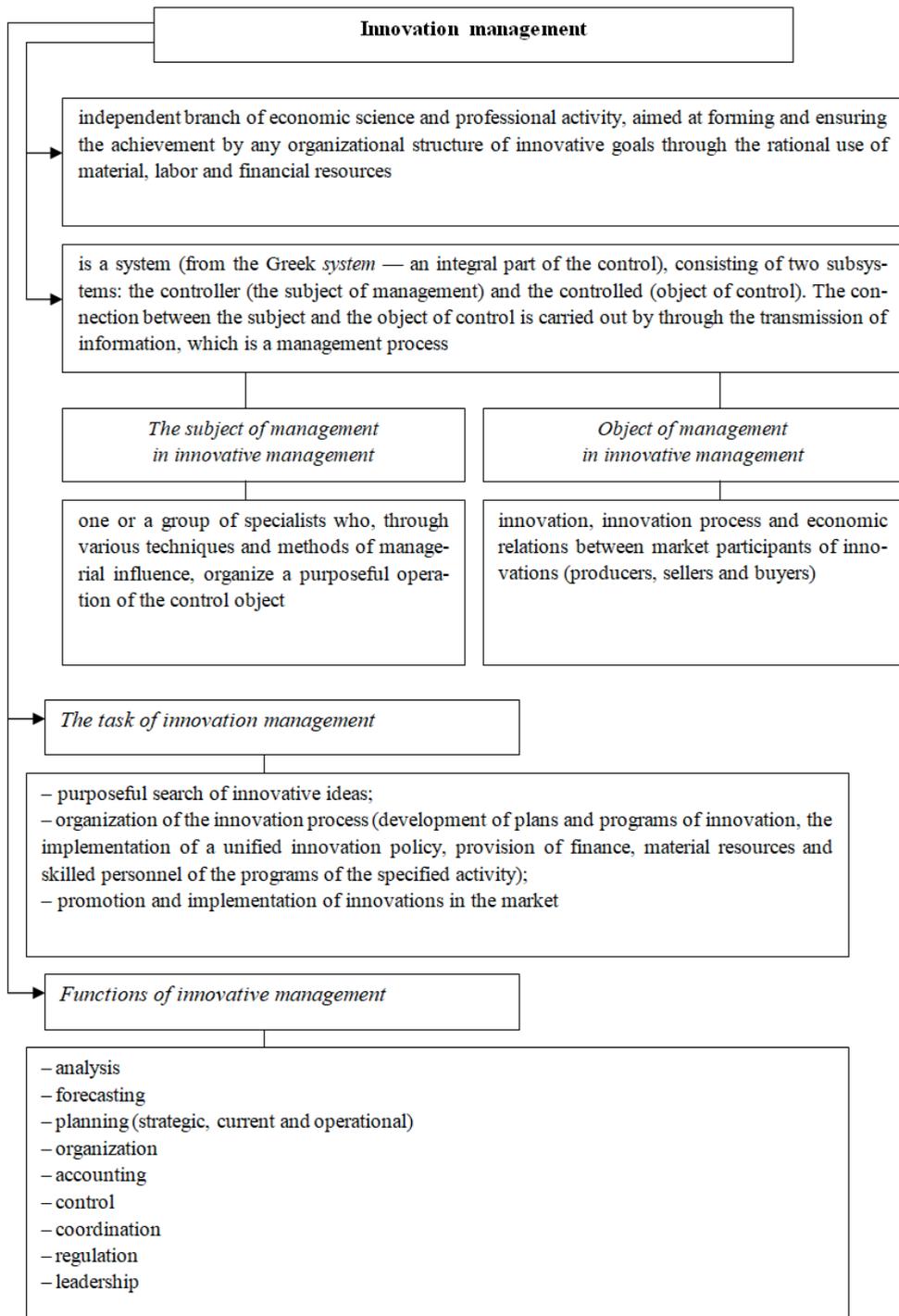


Fig. 5. Concept, structure, tasks and functions of innovative management

The generalized scheme of innovation management is shown in Fig. 6. Innovation management at the enterprise is based on the input information flow, which is determined by indicators of analysis of external and internal environment.

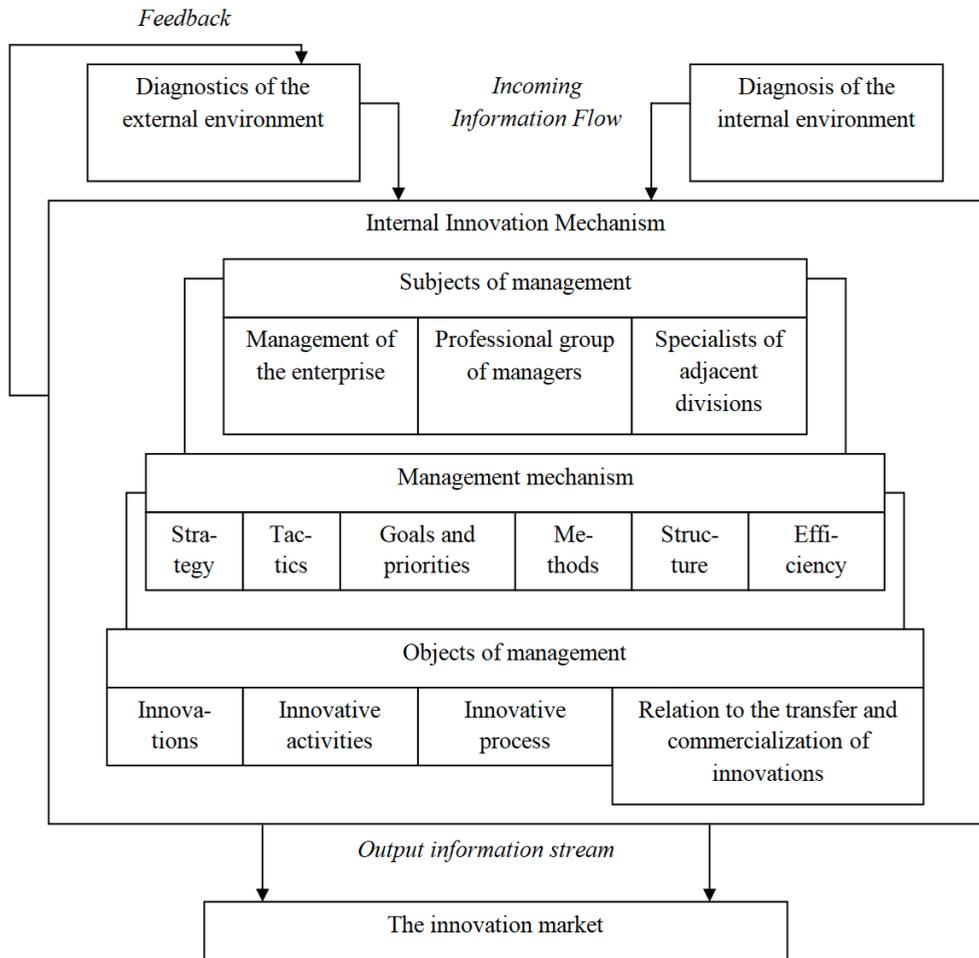


Fig. 6. Generalized scheme of innovation management

Source: Уткіна Ю.М., Вісільова А.В. *Інноваційний менеджмент на підприємствах* / Ю.М. Уткіна, А.В. Вісільова // Вісник економіки транспорту і промисловості, 2014. — № 46. — С. 298–302.

The effectiveness of the innovation activity depends to a large extent on the organization of innovation processes (Fig. 7). All stages of the innovation process require control and management from the side of managers. It is the managers responsible for the correct decision-making in order to achieve the intended result. Of course, the results of innovation activity are significantly dependent

on the level of funding, qualifications of staff involved in the implementation of innovation processes, but can not level the activity of managers. It is the managers who plan, responsible for the process of implementation, control, resource availability, etc.

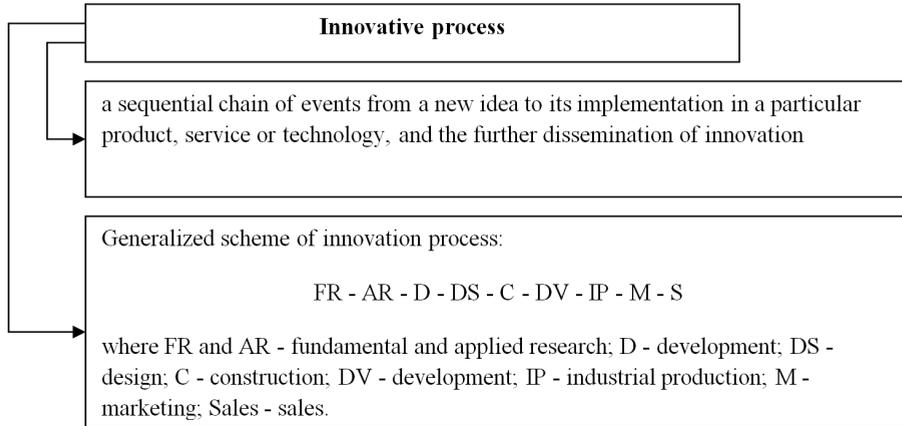


Fig. 7. Concept of innovation process

A detailed list of managerial tasks solved by managers in the innovation sector is shown in Fig. 8.

We create a list of managerial tasks that are solved by managers in the innovation field:

- definition of the goals of strategic management of the organization's development;
- identification of priority tasks, determination of priority and sequence of their solution;
- managing changes in the organization;
- preparation of a system of measures for development and development of new types of products;
- assessment of the necessary resources and the search for sources of their provision;
- ensuring strict control over the implementation of tasks in the field of innovation activity;
- ensuring the competitiveness of the organization in conditions of severe competition;
- achievement of maximum profit in the specific conditions of management;
- early preparation of the necessary innovations;
- improvement of the organizational structure of the organization in accordance with changing requirements;

- ensuring the effective work of each employee and the team as a whole;
- ability to go within reasonable limits to risk and at the same time be able to minimize the impact of risk situations on the financial position of the organization.

The result of the implementation of the innovation process is determined on the basis of taking into account the state of the external environment, the internal environment and the organization of financial and economic activity in the enterprise, as well as the specificity of the innovation process as an object of management (Fig. 8).

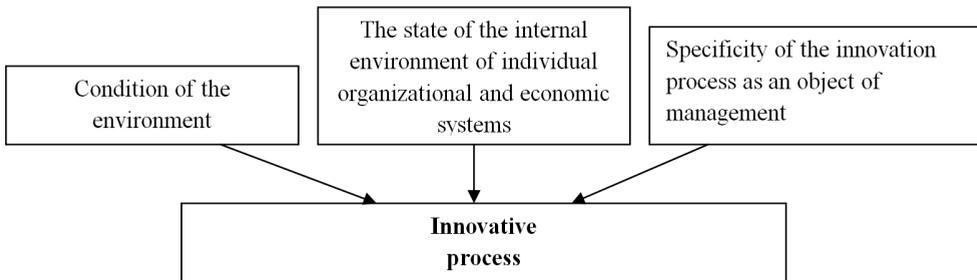


Fig. 8. Factors influencing the innovation process

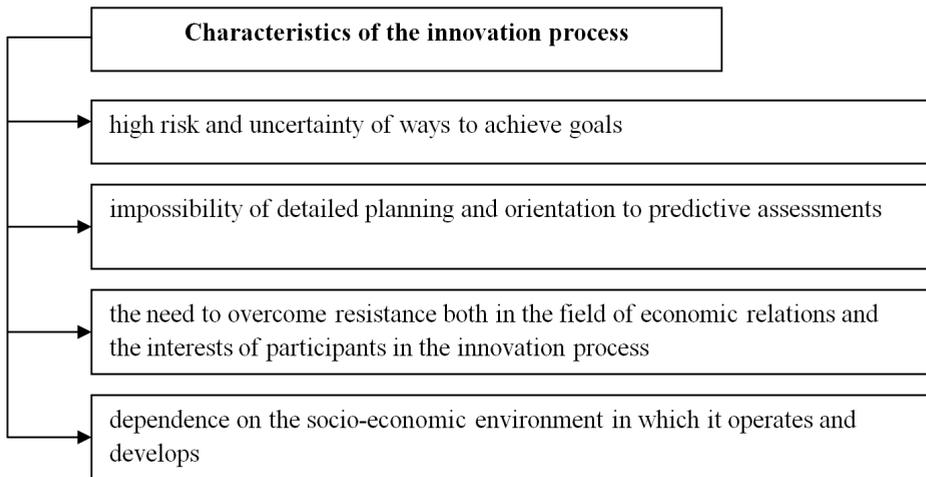


Fig. 9. Characteristics of the innovation process

Before beginning the implementation of innovation processes, it is necessary to take into account the maximum number of characteristics, to miscalculate its potential performance and level of riskiness. The indicative list of characteristics of the innovation process is shown in Fig. 9.

In Ukraine, enterprises that carry out innovation activities face much more challenges and risks, as the sphere of innovation activity has many problems with state regulation.

It is possible to form a list of levers of state regulation aimed at the formation of effective consumer/user innovations in Ukraine:

- government orders, the criteria for selection of which should be strictly in line with the priorities of economic development of Ukraine and increase the competitiveness of the macroeconomic system;
- preferential loans;
- soft taxation when purchasing the latest technology, technologies and other means of production that are the objects of industrial innovation;
- creation of conditions for expanding the market of leasing services;
- improvement of the existing practice of patenting in terms of facilitating the registration of inventions, utility models, industrial designs abroad;
- simplification of licensing practices of scientific and technological companies;
- reduction of customs tariff and simplification of customs procedures at export of domestic goods with high innovative share in value added;
- creation of conditions for the enterprises' interest in the formation of special funds, intended for renewal of the active part of fixed assets of production, at the expense of own capital (stimulation of the practice of depreciation deductions);
- development of venture business in the areas of financing and promotion of innovations in the market;
- transfer by the state and large business entities of technology to specialized scientific and technical companies on terms of outsourcing using the mechanism of preferential or free transfer;
- improvement of property relations through the creation of public-private scientific and technical companies and units in enterprises of this form of ownership in the leading branches of the economy [15, pp. 128–129].

As a conclusion, it is possible to form a list of measures at macro and macro levels [15–17] that will promote the activation of innovation activity in Ukraine:

1. At the country level:

- harmonization (elimination of contradictions) of the provisions of the legislative and normative acts and, above all, the laws of Ukraine “On scientific and scientific and technical activity”, “On innovation activity”, “On priorities of innovation activity in Ukraine”, “On the special regime of innovation and investment activity Techno-parks”, creation of new and development of existing technological parks;

- beginning of financing of large-scale forecast-analytical researches in order to determine the priority directions of scientific and technological and innovative activity;
 - introduction of legislative changes in the field of innovation in relation to benefits and incentives; expansion of funding sources; development of close cooperation with foreign enterprises, which would allow for the exchange of experience; extension of the practice of providing medium-term loans to innovative enterprises with a decrease in interest rates;
 - creation of network innovation structures in the regions on the basis of a cluster approach that would promote the development of cooperation of technologically interconnected enterprises, scientific institutions, financial institutions, administrative bodies;
 - deployment of the intellectual property rights protection infrastructure, which should include not only the authorities issuing the relevant protective documents, but also patent libraries and public databases that would enable domestic authors to carry out at the present time a patent search, protection of their interests in courts, etc.;
 - raising the innovative culture of society;
 - creation of the system of organizational, economic and informational support for the development of innovative processes;
 - realization of measures on popularization of scientific and inventive activity;
 - promotion of a positive attitude towards innovation in society;
 - to develop international cooperation on issues of the formation of innovative culture and to use the best world practice on this issue.
2. At the enterprise level:
- improvement of the management of the innovative system of the enterprise with the corresponding consequences for the financing of innovation activity;
 - Ensuring a favorable climate for the creation of its own high-tech industries of the full cycle through the use of various forms of state support;
 - development of innovation infrastructure of the enterprise by improving the system of informational support of innovation activities, certification and implementation of development, training and retraining of personnel;
 - expansion of cooperation between enterprises in the field of scientific research and innovation;
 - establishing close cooperation with universities in order to use the scientific potential for the creation of new or improved products (services).

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