

ҚАЗАҚСТАННЫҢ ИННОВАЦИЯЛЫҚ ЖӘНЕ ПОСТИНДУСТРИАЛДЫҚ САЯСАТЫН ЖҮЗЕГЕ АСЫРУ ТИІМДІЛІГІ

ЭФФЕКТИВНОСТЬ РЕАЛИЗАЦИИ ИННОВАЦИОННОЙ И ПОСТИНДУСТРИАЛЬНОЙ ПОЛИТИКИ В КАЗАХСТАНЕ

EFFECTIVENESS OF IMPLEMENTATION THE POST-INDUSTRIAL AND INNOVATION POLICY IN KAZAKHSTAN

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Zh.M.Shayekina, D.G.Mamrayeva, L.V.Tashenova

*Ye.A.Buketov Karaganda State University
(E-mail:dina2307@mail.ru)*

The features of the commercialization of innovations: theoretical aspect

In the article the concept of commercialization of innovations was investigated. The classification of the participants of the commercialization of innovations was presented. The stages of the process of commercialization of inventions: assessment and selection of the most lucrative ideas for removing them on the market; accumulation of financial assets; securing the rights on created innovative products or services; organization of development innovation, its introduction into production were examined. Highlighted global trends in innovation activity that define the process of commercialization of innovations, among them: the growth of the activity level of research patent information character; increasing the degree of motivation of innovators and analysis of personnel innovation sphere; increasing emphasis on project-based approach to the management of innovation; the organization in the innovative companies a systematic process of internal audit; the formation of co-operation in the field of R&D; the development of institutions of supporting the innovation activity of the enterprises; increasing the speed of innovation processes and the expansion of the area of their implementation through the active use of information technology.

Key words: innovation activities, commercialization of inventions, the stages of the innovation process, participants in the process of commercialization, technology transfer.

Currently, an innovative activity is seen as the main condition for the modernization of the economy, a systematic update of its logistical capacity, and is a major factor of improving the efficiency of the research teams. Commercialization of the results of the scientific researches and developments is a necessary condition for the strategic development of any organization, because it provides the creation of new products, expanding the range and improving the quality of products (goods and services), improving their production technology, followed by the introduction and effective implementation of the domestic and foreign markets. The general direction of economic development in modern conditions is not simply in the deployment of capacities to meet the challenges of import substitution, but also in their capacity on the basis of a new quality of the process associated with the effective use of innovative potential, expansion of sales volumes innovations. As a consequence, the most important issue to improve innovation need to recognize improved forms of commercialization of its results, stimulation of innovative activity of organizations.

Undoubtedly, further economic modernization of Kazakhstan may only take place with using the latest scientific and technical developments. Particular emphasis is on the building a modern economy based on intellectual resources, was made in the President's Message «New Kazakhstan in the new world». In the President's Message it attaches great importance to infrastructure of «smart» economy. It is not only financing the creation and organization of the economic model, and detailed plans for the preparation of the relevant

personnel of scientific and technological potential of the country, promotion of innovation and inventive activity, creation of an effective legal system, protection of intellectual property. Using the experience of many countries, Kazakhstan was defined long-term vision and plan of action in the field of innovation. The next stage of the innovation policy of Kazakhstan was reflected in the Concept of innovative development till 2020, which was adopted by Presidential Decree in June 2013 [1].

The research of the strategic target settings of socio-economic development of Kazakhstan and international experience of the commercialization institutions of innovations shows that the impact of the innovation infrastructure on various lines of business and the social sphere is amplified, it creates the initial conditions for the formation of a dynamic economic system.

Thus, the research of possible directions of methods, which help to create the effective system of commercialization of innovative activity in the country, is a very important scientific task, requiring in-depth theoretical, methodological and practical elaboration.

In the Law of the Republic of Kazakhstan on October 31, 2015 №381-V «About the commercialization of scientific and (or) scientific and technical activities» the basic provisions of the regulation of public relations, are connected with the activity of commercialization of scientific and (or) scientific and technical activities in the Republic of Kazakhstan, as well as the regulation of the commercialization process and mechanisms of guaranteed state support the commercialization of scientific and (or) scientific and technical activities, were determined.

The law shows the basic concepts of an innovative economy:

1) commercialization of scientific and (or) scientific and technical activities — are activities, related to the practical application of the results of scientific and (or) scientific and technological activities, including the results of intellectual creative activity, with the aim of bringing to the market new or improved products, processes and services, and, also, the activity, which is aimed at removing the income;

2) technology commercialization center is a legal entity, separate division or structural research organization, higher education institution or autonomous educational organization, which commercializes of the results of scientific and (or) scientific and technical activities;

3) the subjects of the commercialization of scientific and (or) scientific and technical activities are physical and (or) legal entities, implementing innovative projects in priority sectors of the economy or engaged the activities in promoting the domestic processed goods, works and services to the domestic and (or) foreign markets;

4) innovation grant is the budgetary funds, provided by the subjects of industrial-innovation activity on a grant basis for the realization of the projects of commercialization of scientific and (or) scientific and technical activities in the priority areas of the economy;

5) start-up company is the first time created legal entity (company), including the participation of the public higher education institutions and public research organizations, that are being in the process of development and building a business, based on new ideas, innovation of science and technology;

6) program of the commercialization of scientific and (or) scientific and technical activities is a single set of linked resource, performers and terms of implementation the measures of conducting the scientific research, research and development, technological works, marketing and promotional operations, ending on the involvement of technology types commodities or services as well as organizational and technical solutions of industrial, administrative commercialized;

7) implementation work are the types of cross-sectoral work, conducted in order to implement the final stages of the research and production cycle development of new products or the introduction of modern technology.

In the present conditions it is not enough to create innovation, no less complex and important task to achieve the final result and to obtain maximum benefit from the innovations created, is the problem of representation of the innovations on the market, that is, it is required to commercialize.

Most researchers associate the concept of commercialization of innovation with the concept of the innovation process, in which the novation is transformed into innovation. It is therefore not surprising that researchers often determine the commercialization phase as the stage of the innovation process. For example, J.P. Morozov gives the following definition of the innovation process: «In general, the innovation process consists of obtaining and commercialization of inventions, new technologies, products and services, making the organizational, technical, economic, social and other results of intellectual activity and is carried out in 4 stages» [2; 64].

J.P. Morozov identifies four stages. The first stage is to conduct fundamental research in various universities, specialized institutes and industry laboratories. The second stage is the stage of applied research, which allows you to «cut off» the unpromising projects before the implementation phase. The third stage is the stage of the development work. And finally, the fourth stage is the stage of commercialization, beginning from the start of production and enter to the market, to stagnant product. Morozov also refers to the fourth stage the life cycle of created innovation.

According to A.A. Trifilova [3; 38], in the innovation process is accepted to allocate the following basic phases and steps:

- basic researches;
- research and development works;
- development works;
- commercialization and production;
- selling of goods, as well as licenses and patents;
- the completion of innovation.

In contrast to the Morozov J.P., A.A. Trifilova, to a lesser extent, the process of commercialization connects with the product’s life cycle. Thus, making the understanding of the commercialization process narrower and stretched over time.

Studying the different views of scientists and theorists in the category of «commercialization», it is worth noting, that, by definition of V.I. Mukhopad, it is a process of transition of the object of a property (in this case, the innovation) into the gains on trading assets [4; 32]. Y.A. Monastyrnyi and Y.N. Grik represent the commercialization like a profit from the selling of innovations or using in their own production [5; 85]. Commercialization of Innovation is the process of allocation of funds for innovations and testing phase of their spending, which includes evaluation and transfer of completed / mastered in industrial environments innovations [6; 62]. Taking into account all of the above opinions, commercialization can be defined as the process of withdrawal of innovations on the market, i.e., bringing innovative products to consumers. All participants in this process can be divided into two categories — innovation developers and buyers (investors) (Fig.).

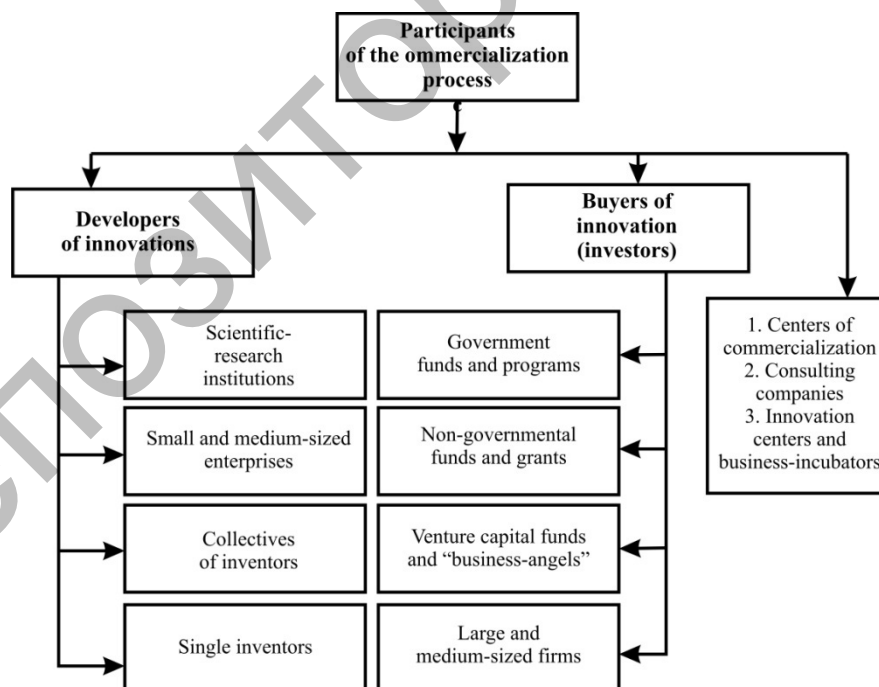


Figure. Classification of the participants of the commercialization of innovations (compiled by the authors)

Analyzing Figure, it is important to note one more participant in the process of commercialization of innovations, acting as intermediaries between buyers and developers of innovations are the innovative centers, centers of the transfer and commercialization of innovations, consulting firms and business incubators.

All of these organizations provide services of a different nature (brokerage, consulting and legal), including work with the intellectual property developers: its protection and promotion.

The process of commercialization of innovations includes several successive stages.

On the first stage, the evaluation and selection of the most lucrative ideas for removing them on the market are occurred. This happens if the company is developing a number of innovative products or services at the same time. This assessment is realized by means of the examination of the following criteria:

- 1) the possibility of innovation, the relevance of this innovative product in a society;
- 2) the demand for innovative goods or services to a potential buyer (in a certain segment of the market);
- 3) the potential economic impact of the implementation of innovative products and services (the pay-back period, net present value, internal rate of return, etc.).

The second stage of the commercialization process is the accumulation of the necessary funds. Due to the fact that only a few innovative companies have sufficient funds for self-financing innovations, the main task of the second stage of the commercialization process will attract investors. The third step is securing the rights to create an innovative product or service with their subsequent distribution among all participants in the process of commercialization. The last, fourth stage of the commercialization process of innovation involves the development of innovation organization and its implementation in production and, if necessary, further refined as needed [7; 104].

There are following global trends in innovation activity development that define the process of commercialization of innovations:

- increasing the level of research activity of patent information character. The collection, processing, analysis of data on innovations, competitors, customers and markets to be carried out during the development of innovation based on patent information and research that provide the basis for the study of external factors of the commercialization of innovations;
- increasing the degree of motivation of innovators and analysis of personnel innovation. The development of intellectual assets as a body of knowledge workers, their leadership skills, entrepreneurial and managerial skills, creativity, problem-solving skills are the objects of value, but may also be the object of commercialization (for example, in the process of outsourcing). However, the dismissal of an employee working in the sphere of innovation, the organization can mean not only the loss of the intellectual capital of the company, but also serious losses during the transition specialist in the company of a competitor;
- increasing the emphasis on the project-based approach to the management of innovation, which provides the implementation of the self-sufficiency principle, and which involves the obtaining an income from the realization of innovations — the sole source of compensation investments, largely determines the choice of forms of commercialization of innovations;
- the organization in the innovative companies the systematic process of internal audit is to assess the various intangible assets available to the organization as a whole and its subsidiaries, in particular, that determines the internal capabilities of the commercialization of innovations;
- the formation of cooperation in the field of R&D, organization of strategic alliances and consortia, which are aimed at the distribution of costs and risks, the target growth of intellectual resources that improve the reliability of results in the commercialization of innovations;
- the development of institutions of supporting the innovative activity of enterprises, which is a catalyst in the creation of innovation and after-following their commercialization;
- increasing the speed of the innovation process and the expansion of the area of their implementation through the active use of information technology. As a result of the information revolution the erasing spatial boundaries was happened, it allowed the innovative companies significantly expand the customer base, the volume of available patent information resources, and accelerate the negotiations on the various transactions, which significantly increased the range of intellectual property and how to commercialize innovations;
- facilitate decision-making in innovation-based method of controlling, which provides a measure of planned and actual revenues and expenses in the commercialization of innovations [8; 59, 9; 65].

Based on the research works of foreign and domestic scientists, studying the features of technology commercialization, differences have been identified for technology transfer from the commercialization of innovations. It was determined that the main difference from the commercialization of innovations of technology transfer is to make profit from the introduction of innovation:

- commercialization of the technology necessarily implies a profit and do not necessarily associated with the connection of the third parties (except the source of technologies and end-user);

– technology transfer involves the compulsory technology transfer to the recipient, which carries out its industrial development, but it is not necessarily associated with profit as the author of the technology and its recipient (in particular, this applies to the environmental technologies).

The analysis indicates that in the economy of the Republic of Kazakhstan in most cases the technology transfer is carried out on a commercial basis.

These companies' researches with experience of successful innovation to the market have identified the main factors of success of innovative companies:

- the right choice of strategy for the implementation of innovation;
- creation of an optimal organizational structure, allowing a minimal cost to introduce a new product;
- timely monitoring of all stages of the project implementation of the new product.

Knowledge of these successful factors allows us to optimize the organizational structure of the company for achieving the maximum effect from the introduction of innovative technologies.

Consider the issues of the commercialization of innovation is necessary from the beginning of the life cycle of innovation, i.e. needs analysis and taking into account data collected at the stage of basic research. Furthermore, the decisive influence the results of the analysis of commercialization of innovations in the course of the further introduction of innovations, including the rejection of timely innovations.

Model of the commercialization of innovations, stand out from the life-cycle model of innovation, consists of the following four blocks [10; 47]:

- analysis of the basic researches;
- analysis of applied researches;
- analysis of marketing researches;
- analysis the results of the implementation of innovations.

On the first stage of commercialization of innovation model is performed the following analysis:

- technological audit of an innovative product;
- preliminary assessment of the risks of investments;
- analysis of the prospects and prospects of commercialization.

On the second stage «analysis of the applied research» the following activities are revealed:

- examination of applied research;
- analysis and assessment of investment risks;
- analysis of the effectiveness and the prospects of commercialization.

The next stage of the commercialization model is a step of analyzing the data coming from the stage of development work. Analysis of these data is carried out in three directions:

- analysis and assessment of investment risks;
- marketing researches of the outlets markets of the created products;
- comprehensive analysis of the competitiveness of created products.

On the fourth stage is necessary to identify the effectiveness of the used model of commercialization.

Summing up should be carried out in several directions:

- marketing researches of the introduction of innovative products;
- evaluation of implementation of the business plan was drawn up at the stage of development activities;
- analysis and evaluation of the campaign of commercialization of an innovative product.

The project of the commercialization of innovations consists of the following subsystems [11; 50]:

- strategic subsystem: goal is finding and achieving the «ideal» competitive position; criterion is an economic efficiency;
- organizational subsystem: goal is improving the maturity of the organization of innovative processes and effective using of organizational resources; criterion is an efficiency of the entire enterprise;
- psychosocial subsystem: the goal is more efficient using of human resources; criterion is a performance of work;
- production subsystem: an increase in production and innovation capacity and increasing the efficiency of its using; criteria is a capital productivity;
- financial and economic subsystem: the goal is more efficient using of financial resources; criterion is the profitability of cash resources;

- information technology sub-systems: the objective function is more efficient using of information; criterion is the profitability of information resources;
- legal subsystem: goal is increasing the security activities, ensuring the licensing of patents; criterion is the level of risk, actual or potential losses from risks.

The criteria of the commercialization of innovations are divided into external and internal. External criteria: market demand; market conditions; effective demand; the presence of competitors; competitive products; the needs of the consumer; annual capacity of the market; average annual growth rate of the market; the potential of the product; the coverage of the market.

There are the following internal criteria of the commercialization of innovations:

- innovative capacity of the organization;
- parameters of economic and social efficiency innovations;
- innovation activity of the personnel;
- ratio of funds, are intended for research and development;
- the proportion of personnel engaged in R&D in total personnel;
- ratio of assets, are intended for the research and development;
- a ratio of the intellectual property;
- factor of development of new technology;
- the share of the budget for the marketing of innovative products in the total marketing budget of the organization;
- total enterprise resources, are necessary for the implementation of the innovative project.

Thus, the concept of commercialization of innovations was investigated and the existing models of the commercialization of innovations offered by foreign and domestic authors were analyzed. In most of the researches the commercialization is presented as a phase of the innovation process, beginning with the start of production, and expiring at the stagnation of the product's life cycle. This approach is flawed. For the successful implementation of innovation it is necessary to deal with its commercialization at an earlier stage, with almost basic researches in parallel assessing opportunities for the commercialization of innovations at all stages of its creation.

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Ж.М.Шаекина, Д.Г.Мамраева, Л.В.Ташенова

Инновацияларды коммерцияландырудың ерекшеліктері: теориялық аспект

Мақалада инновацияларды коммерцияландыру түсінігі зерттелген. Инновацияларды коммерцияландыруға қатысушылардың жіктемесі жүргізілген. Өнертабыстарды коммерцияландыру үрдісінің кезеңдері қарастырылған: нарыққа енгізу мақсатында неғұрлым пайдалы тауарларды бағалау және таңдау; қаржылық құралдарды шоғырландыру; жасалған инновациялық тауарлар немесе қызметтерге құқықтарын бекіту; жаңалықты әзірлеуді ұйымдастыру, оны өндіріске енгізу. Жаңалықтарды коммерцияландыру үрдісін анықтайтын инновациялық қызмет дамуының әлемдік тенденциялары бөліп көрсетілген, оның ішінде патентті-ақпараттық сипаттағы зерттеулер белсенділігі деңгейінің өсімі; инновациялық қызметке қатысушылар уәждеме деңгейінің өсімі мен инновациялық орта қызметкерлерінің талдауы; инновацияларды басқарудағы жобалық тұғырға екпіннің жоғарылауы; инновациялық компанияларда жүйелі ішкі технологиялық аудит жүргізу; ҒЗТҚЖ саласында кооперацияларды қалыптастыру; кәсіпорындардағы инновациялық қызметті қолдау институттарын дамыту; инновациялық үрдістер жылдамдығын арттыру және ақпараттық технологияларды белсенді пайдалану арқылы оларды жүзеге асыру облыстарын кеңейту.

Ж.М.Шаекина, Д.Г.Мамраева, Л.В.Ташенова

Особенности коммерциализации инноваций: теоретический аспект

В статье исследовано понятие коммерциализации инноваций. Проведена классификация участников коммерциализации инноваций. Рассмотрены этапы процесса коммерциализации изобретений: оценка и отбор наиболее выгодных идей для выведения их на рынок; аккумуляция финансовых средств; закрепление прав на созданные инновационные товары или услуги; организация разработки нововведений, его внедрение в производство. Выделены мировые тенденции развития инновационной деятельности, которые определяют процесс коммерциализации нововведений, среди которых: рост уровня активности исследований патентно-информационного характера; увеличение степени мотивации участников инновационной деятельности и анализ персонала инновационной сферы; усиление акцента на проектный подход к управлению инновациями; организация в инновационных компаниях систематического внутреннего технологического аудита; формирование кооперации в области НИОКР; развитие институтов поддержки инновационной деятельности предприятий; увеличение скорости инновационных процессов и расширение области их реализации посредством активного использования информационных технологий.

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