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INTERNATIONAL EXPERIENCE IN DEVELOPING A MECHANISM FOR INNOVATION PROCESS MANAGEMENT

This article examines the key aspects of worldwide experience in the development of mechanisms for managing innovation processes. The analysis of the research results shows that the greatest successes in socio-economic development are achieved by those countries where the priority of economic policy is government and business support for various types of innovations, the development of high-tech industries and active research and design work. Today, the ability to develop and implement innovations plays a crucial role for sustainable economic growth. Long-term improvement of innovation management mechanisms in the field of entrepreneurship will make it possible to identify and eliminate existing barriers hindering the disclosure of innovative potential, which, in turn, will contribute to the growth of business efficiency and increase the competitiveness of key sectors of the economy. The article also analyzes various innovation process management systems, highlights the main forms and methods of conducting innovative business abroad. Special attention is paid to the existing models of national innovation systems in other countries and examples of successful implementation of innovations in economic activity at the international level.

Keywords: innovation, entrepreneurship, innovation process, research firm, SME, management mechanism, commercialization, R&D.

Кілт сөздер: инновация, кәсіпкерлік, инновациялық үрдіс, зерттеушілік фирма, шағын және орта бизнес, басқару механизмі, коммерциаландыру, ҒЗТҚЖ.

Ключевые слова: инновация, предпринимательство, инновационный процесс, исследовательская фирма, малый и средний бизнес, механизм управления, коммерциализация, НИОКР.

Introduction. The economic stability and growth of advanced countries largely depend on the active development of entrepreneurial initiatives in the field of innovation, which make it possible to introduce scientific and technological achievements into production processes. Kazakhstan has implemented many government programs aimed at creating conditions for economic diversification and active use of innovations. One of the key directions of the Strategic Development Plan of Kazakhstan until 2025 is comprehensive support for entrepreneurship as a key driver of economic growth. Significant efforts have been made to improve the business climate, and Kazakhstan stands out among other countries in terms of business-oriented reforms. Small business and medium-sized business play a central role in promoting innovation and provide the basis for their further development. Innovative activity in the economy covers all stages — from the search and development of new ideas to their improvement and commercialization. This requires effective organizational structures and management decisions. Nevertheless, there is often a gap between the availability of innovative resources and their practical implementation. To eliminate these barriers, new management approaches are needed that will help develop government incentives to boost business innovation. The main objective of the study is to study international innovation management practices in leading countries of the world and determine the possibilities of their application in Kazakhstan. As part of the work, a theoretical analysis and review of scientific publications were carried out to identify the most successful tools for managing innovation processes.

Literature review. Modern scientific research focuses on various aspects related to the development of innovations. Among the key topics are the provision of infrastructure that promotes innovation and the development of mechanisms to minimize risks when introducing new technologies. It also explores approaches to the formation and development of human resources, as well as motivation tools for authors

and developers of innovations. An important place is occupied by the study of the role of state institutions in supporting and stimulating innovation processes. Special attention is paid to project management at the stages of scientific research and experimental development, analysis of the life cycle of innovations and analysis the results of their implementation.

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A significant contribution to the development of this direction was made by the following domestic scientists: R. Alshanov [1], F. Alzhanova [2], R. Baitasov, J.F. Dnishev [3], M. Kenzheguzin [4], O. Sabden [5], S. Satybalдин [6], B.N. Issabekov [7], M. N.Cherkasov [8] , and others.

The issues of the essence of innovation, innovation processes and innovation activity are reflected in the scientific works of foreign authors such as Hromov G.S [9], Mahortova V.K [10].

The research results of the above-mentioned authors compose the scientific and theoretical-methodological background for studying the problems of development of entrepreneurial structures based on the innovation flow. At the same time, despite the large amount of scientific literature devoted to the topic under study, the issue of mechanisms for managing the innovation process in entrepreneurship that contribute to improving economic growth and its competitiveness is currently insufficiently disclosed and requires further development.

The main part. Economic growth in developed countries largely depends on activity in the field of innovation. States which have favorable conditions for the introduction of innovations are the leaders of the global economy. The development of the innovation sector plays a key role in strengthening the high-tech economy, which requires effective support systems and institutions to ensure the successful implementation of innovation processes.

According to world experience, the most successful countries are those where government policy and business are aimed at introducing innovations and supporting new research and development

Despite the differences between national science systems, several common trends can be identified for the leading industrial states. These include:

- strengthening the role of the state in regulating and supporting innovation;
- focus on the development of innovations aimed at solving urgent problems such as telecommunications biotechnology, environmental protection;
- implementation of large-scale scientific and technical programs;
- implementation of innovative development programs designed for 10 years or more;
- expansion of international cooperation and attraction of foreign capital, which stimulates the creation of innovative units in regions with favorable investment conditions.

The globalization of innovation affects not only research priorities, but also business organization, introducing new approaches to management and forming a modern corporate culture.

There are four main models of national innovation systems: North American, Western European, East Asian and alternative. Each of them relies on unique strategies: from creating innovations to transferring and borrowing them. The Western European model, common in countries with developed scientific centers, is focused on the comprehensive expansion of innovation. It covers the entire life cycle of innovation — from basic research and applied science to commercialization and mass innovation.

Most Western European countries traditionally occupy leading positions in the world rankings. The following countries ranked high in the annual Global Innovation Index [Global Innovation Index] rankings in 2021 and 2022 (Table 1).

Table 1

West European countries in the world rankings

| State | 2019 | 2020 | 2021 | 2022 |
|-----------------|------|------|------|------|
| Switzerland | 1 | 1 | 1 | 1 |
| Sweden | 3 | 3 | 2 | 2 |
| The Netherlands | 5 | 4 | | 3 |

| | | | | |
|--------------------------|----|----|----|----|
| Great Britain | 2 | 2 | 3 | 5 |
| Denmark | 8 | 10 | 8 | 6 |
| Ireland | 11 | 8 | 7 | 6 |
| Finland | 4 | 6 | 5 | 8 |
| Germany | 13 | 12 | 10 | 9 |
| Luxembourg | 9 | 9 | 12 | 12 |
| Note - compiled from [2] | | | | |

An analysis of the economic development indicators of the Euro-Atlantic states indicates that the leading countries maintain stable positions in the world rankings, and changes in their places are insignificant. In the modern period, Western European states are characterized by two main vectors of development: on the one hand, an emphasis on the independent strengthening of internal resources, on the other — active participation in the unification of scientific and innovative potential within the framework of a single European research space [3].

The self-reliance approach is a characteristic feature of Switzerland, the Netherlands and Scandinavian countries such as Sweden, Finland, Norway and Denmark. The national innovation systems of these states are based on key principles: significant state support for science in limited areas; active participation of large businesses in the development of applied research and development; significant contribution of small and medium-sized businesses to financing innovative initiatives; and significant support for innovation activities at the regional level. The scientific base of the innovation systems of these countries is mainly represented by research conducted in the academic environment [4].

The active type includes North American, Western European, East Asian and alternative models, with similar elements observed in a number of other regions such as Israel and Australia. This approach has become typical for advanced OECD countries, as well as for states that actively innovate selectively, for example, China and some APEC members. A distinctive feature of this subgroup of countries specializing in the export of innovations lies in their ability to develop technologies based on their own scientific and technical infrastructure, while not excluding the possibility of using advanced foreign solutions. Smaller states such as Canada, Belgium and Denmark, as well as less developed EU members including Spain, Portugal and Greece, show a higher dependence on imported innovations. On the other hand, the United States of America, where most of the world's high-tech developments are concentrated, including in multinational corporations and independent research centers, is minimally dependent on external supplies of innovations [5].

The experience of the United States and a number of other countries demonstrates that the creation of an intermediate link between science and business through the expansion of horizontal links — such as consulting companies, specialized innovation organizations and service providers — has significantly simplified intersectoral scientific and technical exchange and accelerated the introduction of innovations. These processes reflect the harmonious interaction of national and global strategies in the field of science, technology and innovation. Although globalization takes some of the innovation activity beyond the borders of the initiator countries, the basis of this activity remains national. This is due to the unique conditions of each country, including established ties with scientific institutions and consumers, as well as the availability of financial and human resources. As a result, states develop and implement innovation policies, creating favorable conditions for the development of innovation within the country.

In the United States, special attention is paid to economic incentives to support innovation. Government regulation covers the entire system of economic and legal relations in the field of intellectual property, where inventors and R&D developers play a key role. The American innovation model is based on three main elements:

- Universities that not only train personnel in the field of high technology, but also actively participate in the creation and commercialization of new developments.
- National laboratories, working mainly under government contracts.
- Innovation clusters and technology parks that combine research centers and high-tech companies on the same territory.

Thus, the American innovation management system is characterized by an integrated approach to the formation of policies and programs in this area. The legislative framework and various levels of innovation are integrated for the effective implementation of the innovation strategy [5].

The US innovation policy stands out with an emphasis on self-development of business based on the principles of fierce competition. An important factor in the growth of innovative entrepreneurship is the activity of research firms.

A research firm is an innovative business format focused on creating and maintaining processes for generating new knowledge. It covers the full cycle — from the implementation of key stages of R&D to their practical application and transformation into innovations. In such a model, knowledge and innovation become the main assets that determine success [6].

Research firms can use both linear and nonlinear models of innovation. The linear approach assumes consistent development. Fundamental research is conducted at universities. Then the results of these studies are transferred to the economy and society, and companies implement them to create applied solutions and increase profits. At the same time, the nonlinear model is aimed at flexibility and parallelism of processes. In this case, fundamental research and the implementation of this knowledge are developing simultaneously and are interconnected. This approach supports creative projects and the introduction of new solutions at all stages [7]. The introduction and development of non-linear innovations may include the following aspects:

1) Research firms simultaneously participate in various stages of technological cycles, covering various levels of technological maturity.

2) These companies promote so-called "organizational employment" by allowing their employees to collaborate with other research organizations, including academic institutions and universities. This scheme, similar to the "concert economy" in the digital sphere, is a form of collaboration in which specialists work in several organizations at the same time. This contributes to the development of networking and the expansion of knowledge in a high-tech economy [8].

The development of network connections between employees and organizations is becoming an important element of the modern innovative economy. In this case, we present a diagram illustrating the relationship between research firms, commercial organizations, and research institutes. This diagram demonstrates the full cycle of creating and using knowledge that is necessary for innovation.

Research companies are important for the integration of scientific research and the educational process. They actively cooperate with universities and academic centers. Modern research institutes are the foundation of innovative entrepreneurship. They are of particular importance for sustainable development and the implementation of advanced solutions [9].

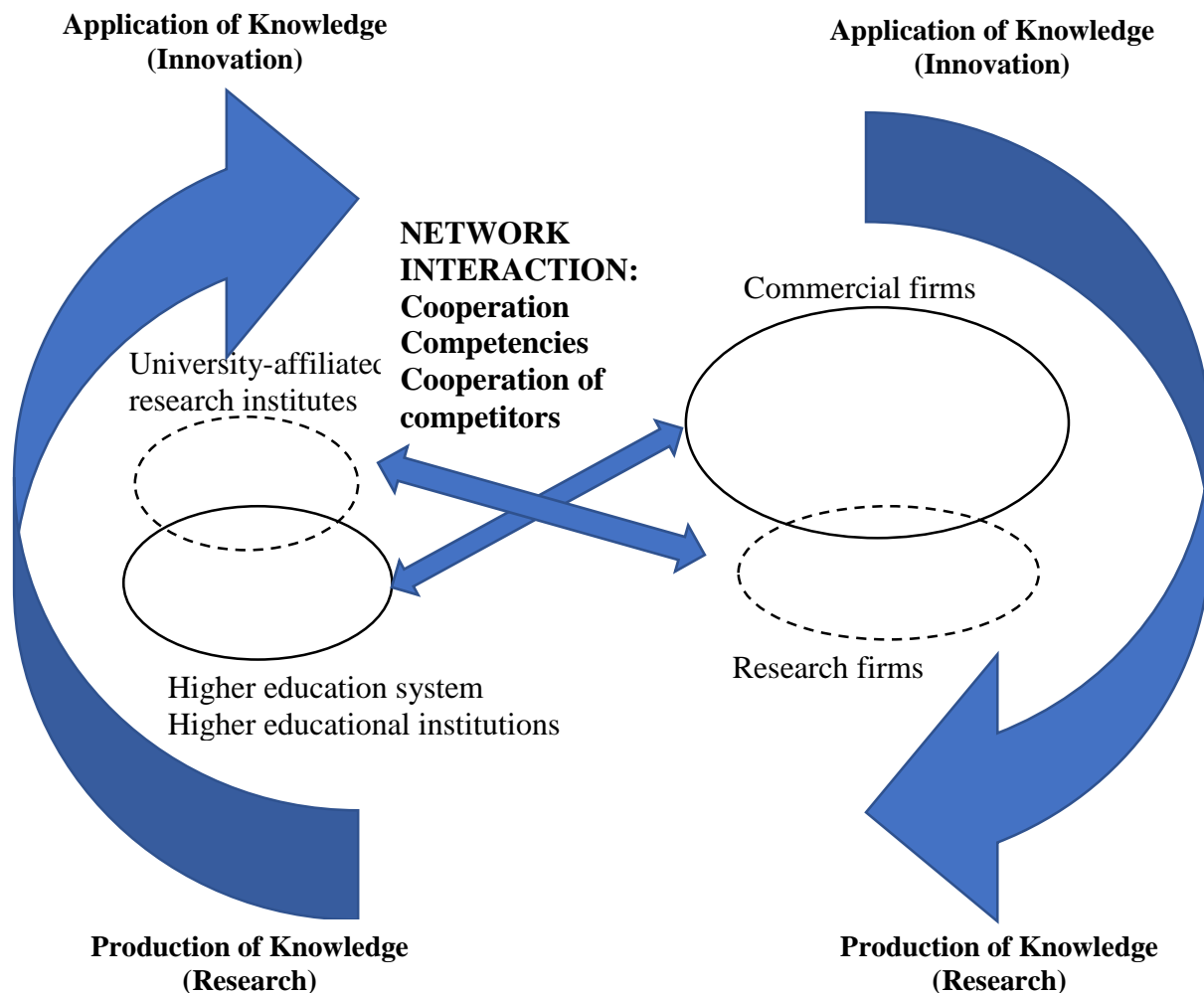


Chart 1 – Functioning of research firms within the cycle of production and application of knowledge [9]

A research firm has several key characteristics that distinguish it from other types of business. Their activities are focused on the search for new knowledge and its implementation, as well as on the pursuit of innovation. Firms of this type are focused on research. They motivate their employees and help create an atmosphere focused on innovative progress. They work closely with universities and research institutes, providing access to academic knowledge and the results of basic research.

The company also pays special attention to the continuing education and professional development of its employees, offering flexible working conditions. For example, such companies may offer their employees part-time jobs. An important feature is the support of cross-employment, which allows employees to work in several research and educational organizations at the same time, which contributes to the development of networking and the exchange of experience. This model helps to create an innovative environment in which knowledge is effectively transformed into new solutions and technologies [10].

Cooperation between research firms and universities is especially important for the development of the modern economy. Despite the fact that the main tasks of universities are the professional training of employees and scientific research, their tasks do not always coincide with the commercial goals of inventions.

Government policies that support the commercialization of innovations are often aimed at simplifying this process. This includes promoting the application of R&D results in the public interest through licensing and other methods, compliance with legal norms in commercialization, as well as attracting funding for research. It is also important to ensure the freedom of research, protecting it from intellectual property violations and guaranteeing the right to use the developments of others if necessary. The profit from

commercialization should be fairly shared among all participants, and the research results should remain available for further scientific use.

Thus, research firms have the potential to transform business approaches by focusing on knowledge and innovation. Such firms represent not only a promising direction for modern business, but also a path to further change and success in the knowledge economy. They strive to integrate innovation and entrepreneurship, with a particular focus on sustainable development, making them an important element of the future economy. As a result, a research firm becomes a new form of business organization focused on the effective use and development of knowledge in an innovative economy. The role of research firms in the development of innovative entrepreneurship has increased dramatically with the increasing trend of digitalization in modern society. The development and adoption of information, communication and digital technologies is pushing small research organizations into the active competitive environment of the digital economy, which is why this factor is discussed in detail in the next subsection.

Studies show that the use of successful international experience in domestic practice will contribute to a more effective management of the innovation process in entrepreneurship, as the government support in some foreign countries has a stimulating effect.

Conclusion. Based on world experience, high rates of economic growth are achieved by those countries that have created an effective technology commercialization system. The key factor in all these countries was government support, which had a positive impact on the development and implementation of innovations. Unfortunately, the current situation with the commercialization of innovations in Kazakhstan leaves much to be desired and requires further development. At the moment, the number of technoparks, commercialization departments at institutes and venture funds is limited, and the number of high-quality innovative projects remains low. Therefore, adapting international best practices is key to accelerating this process.

The analysis of foreign innovation management practices makes it possible to develop recommendations for improving innovation management mechanisms in the business sector of the regions of Kazakhstan. Such measures may include government support for innovative projects through management and government involvement; financing through direct investment, tax preferences, grants and subsidies, as well as through government procurement and procurement mechanisms (for example, in the United States). An important area is the establishment of effective interaction between manufacturing enterprises, scientific institutes and educational institutions (the practice of the USA and Japan). The presence of technopolises, innovation clusters and technoparks is the foundation for the activation of innovative processes (for instance, Japan and the USA). Such government initiatives have a significant stimulating effect, strengthening the cooperation of large corporations with small and medium-sized businesses, which contributes to the development of an innovative ecosystem.

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ИННОВАЦИЯЛЫҚ ҮРДІСТЕРДІ БАСҚАРУ МЕХАНИЗМІН ҚАЛЫПТАСТЫРУДЫҢ ШЕТЕЛДІК ТӘЖІРИБЕСІ

Аңдатпа

Бұл мақалада инновациялық процестерді басқару тетіктерін әзірлеудің әлемдік тәжірибесінің негізгі аспектілері қарастырылады. Зерттеу нәтижелерін талдау экономикалық саясаттың басымдығы мемлекет пен бизнестің инновациялардың әртүрлі түрлерін қолдауы, жоғары технологиялық өндірістерді дамыту және белсенді ғылыми-зерттеу және конструкторлық жұмыстар болып табылатын елдер әлеуметтік-экономикалық дамуда үлкен жетістіктерге қол жеткізетінін көрсетеді. Бүгінгі таңда инновацияларды әзірлеу және енгізу қабілеті тұрақты экономикалық өсу үшін шешуші рөл атқарады. Кәсіпкерлік саласындағы инновацияларды басқару тетіктерін ұзақ мерзімді жетілдіру инновациялық әлеуетті ашуға кедергі келтіретін бар кедергілерді анықтауға және жоюға мүмкіндік береді, бұл өз кезегінде бизнес тиімділігінің өсуіне және экономиканың негізгі салаларының бәсекеге қабілеттілігін арттыруға ықпал ететін болады. Мақалада сонымен қатар инновациялық процестерді басқарудың әртүрлі жүйелері талданады, шетелде инновациялық бизнесті жүргізудің негізгі формалары мен әдістері қарастырылады. Басқа елдердегі ұлттық инновациялық жүйелердің қолданыстағы модельдеріне және халықаралық деңгейде экономикалық қызметке инновацияларды сәтті енгізу мысалдарына ерекше назар аударылады.

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ЗАРУБЕЖНАЯ ПРАКТИКА ФОРМИРОВАНИЯ МЕХАНИЗМА УПРАВЛЕНИЯ ИННОВАЦИОННЫМИ ПРОЦЕССАМИ

Аннотация

В данной статье рассматриваются ключевые аспекты мирового опыта разработки механизмов управления инновационными процессами. Анализ результатов исследования показывает, что наибольших успехов в социально-экономическом развитии добиваются те страны, где приоритетом экономической политики является поддержка государством и бизнесом различных видов инноваций, развитие высокотехнологичных производств и активная научно-исследовательская и конструкторская работа. Сегодня способность разрабатывать и внедрять инновации играет решающую роль для устойчивого экономического роста. Долгосрочное совершенствование механизмов управления инновациями в сфере предпринимательства позволит выявить и устранить существующие барьеры, препятствующие раскрытию инновационного потенциала, что, в свою очередь, будет способствовать росту эффективности бизнеса и повышению конкурентоспособности ключевых отраслей экономики. В статье также анализируются различные системы управления инновационными процессами, освещаются основные формы и методы ведения инновационного бизнеса за рубежом. Особое внимание уделяется существующим моделям национальных инновационных систем в других странах и примерам успешного внедрения инноваций в экономическую деятельность на международном уровне.

