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Problems of formation and development prospects of small innovative business in Kazakhstan

The article identifies the main problems of the development of innovative activity and activity of enterprises, as well as the innovative potential of industries of the Republic of Kazakhstan. The authors of the article analyzed the indicators characterizing enterprises and the number of employees involved in research and development. The authors highlighted the main reasons restraining the activity of enterprises in the field of new technologies: low level of demand of industrial enterprises for innovative technologies; lack of financial resources for innovative development; lack of highly qualified workers employed in high technology sectors; lack of motivation of economic entities in the implementation of innovations; the lack of focus on business development of innovative human capital. According to the authors, small innovative businesses have special advantages in introducing new technologies: adaptability to new requirements of technological progress; the ability to quickly diversify the specialization of production; flexibility in expanding the range of products. The article offers recommendations on the development of small innovative business in Kazakhstan: the use of a modern interactive approach; use of advanced technologies; attracting scientists to implement innovative projects; stimulation of innovative activity of small businesses; development of partnership mechanisms between the state, private business and society.

Keywords: innovative business, innovative development, innovative activity, innovative activity, technological innovation, innovative potential, innovative products.

The innovative development of industry involves the formation of new technological systems by creating fundamentally new forms of organization and interaction mechanisms of all participants in the innovation process. The transition of the economy of the Republic of Kazakhstan to an innovative path of development is possible only on the basis of accelerated technological development of all sectors of the real sector of the economy. At the same time, it is important to take into account the current state in order to identify the most problematic places and reverse negative trends, to form a selective scientific, technical and innovative component focused on the implementation of reasonably chosen priorities that will ensure the successful development of a comparative narrow field of promising technological breakthroughs [1].

Before addressing the problem of assessing innovation in the industry of Kazakhstan, it is necessary to clarify the parameters for assessing the innovative level of the industry. In the economic literature, studies of the category «innovation level» are mainly carried out for micro and macroeconomic systems. At the same time, the presence of significant specifics of the innovative development of mesosystems requires its consideration in the formation of a system of indicators of the innovative level. Let us designate modern methods of analysis of economic systems used abroad and in domestic practice [2].

It should be borne in mind that the assessment of the innovative level of the economy is carried out using a system of indicators, some of which are not a criterion of effectiveness. Note that in the classification of assessments of the innovative level of the economic system, the following groups of indicators can be distinguished: indicators of the result of innovative activity; indicators of costs for innovation; indicators that correlate costs and results of innovation.

Currently, the monitoring of innovation in Kazakhstan does not include indicators that correlate the costs and results of innovative activities of industrial enterprises, and the indicators of results and costs of innovative activities mainly contain only statistical data, which does not allow an objective assessment of innovation. At the same time, indicators of the ratio of costs and results of innovative activities are the basis for clarifying the innovative level of economic systems.

In our opinion, the system of indicators of the innovation level, combining the statistical states of economic systems, should be supplemented by a group of indicators that allow us to assess the nature of the dynamics of their development. Using the information of the Agency of the Republic of Kazakhstan on Statistics, we will analyze the current state of science and innovative development of Kazakhstan [3].

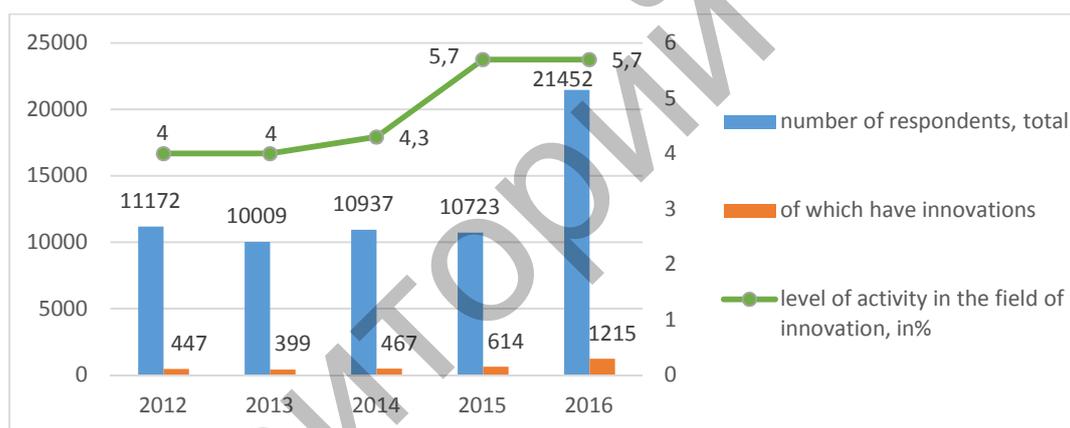
Analysis of the main indicators of innovation will be carried out according to Table 1.

Key indicators of innovation

Indicators	2013	2014	2015	2016	2017	2017 in % 2013
Domestic research costs in million tenge	34761,6	38988,7	33466,8	43351,6	51253,1	147,4
in% of GDP	0,22	0,23	0,15	0,16	0,17	77,3
Number of organizations performing research and development	421	414	424	412	345	81,9
The number of personnel engaged in development and research, people	16304	15793	17021	18003	20404	125,1
Fixed assets of organizations engaged in research, million tenge	19177	22003	22811	29527,5	37950,6	197,9
In% of total fixed assets	0,25	0,22	0,20	0,24	0,27	109,8

Source. Compiled by the authors on [4, 5].

The data in the table indicate that the internal costs of research and development for the period 2013–2017. increased by 47.4 % and in 2017 amounted to 51.3 billion tenge. At the same time, relative to the country's GDP, domestic costs decreased throughout the entire period, if in 2013 it was 0.22 %, then in 2017 it was 0.17 %, i.e. decreased by 22.7 %.

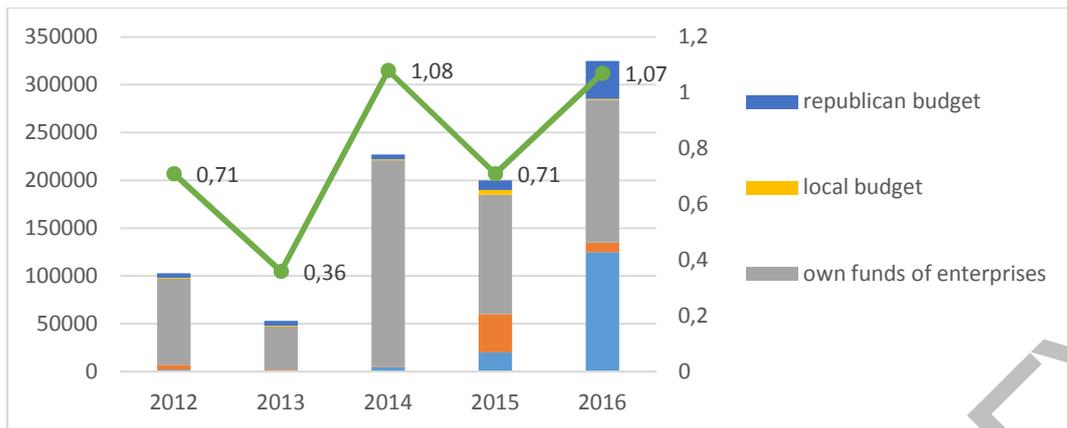


Source. Compiled by the authors on [4, 5].

Figure 1. The level of innovation activity

If we talk about the number of organizations that performed research and development, negative trends are observed here, which are expressed in a decrease of 76 organizations. If in 2013 421 organizations were engaged in research, then in 2017 — 345 organizations. It should be noted that the number of personnel engaged in research and development in 2017 increased by 25.1 % compared to 2013. Let us analyze the main indicators of innovative activity of enterprises according to Figure 1.

As can be seen from Figure 1, the number of enterprises participating in the survey on innovation for the period 2012–2016. increased from 11172 in 2012 to 21452. Among the respondents, the number of enterprises with innovations increased 2.7 times, i.e. from 447 to 1215, which affected, respectively, the level of innovative activity of enterprises, which from 4 % in 2012 increased to 5.7 % in 2016. In our opinion, a comprehensive assessment provides an objective picture of the state and level of innovative potential of Kazakhstan's industry. I would like to pay special attention to its qualitative characteristics, since in recent years there has been an increase in the volume of industrial products and an increase in innovation costs, but the level of introduction of new technologies in industry remains very low [6].

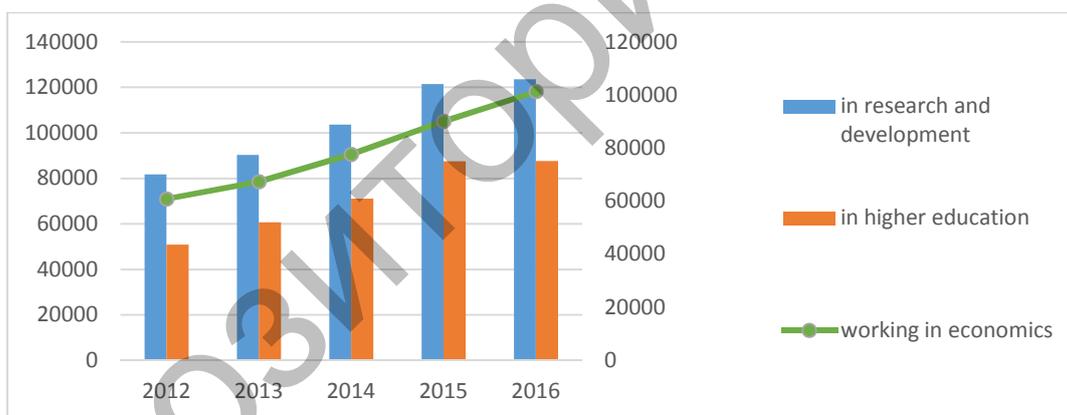


Source. Compiled by the authors on [4, 5].

Figure 2. Cost composition for technological innovations by financing sources, mln tenge

To analyze the structure of costs for technological innovation of enterprises by sources of financing, we use the data in Figure 2. From the analysis of the structure, it is clear that the costs of technological innovation are carried out mainly at the expense of enterprises. This, on the one hand, is a positive trend, on the other hand, domestic enterprises for the most part do not have sufficient financial resources to carry out large-scale creation and implementation of technological innovations in industrial production. At the same time, the share of total costs in the country's GDP for the analyzed period ranges from 1 %.

Analysis of the costs of innovation includes indicators such as the wages of personnel engaged in development; internal research and development costs; technological innovation costs. According to Figure 3, we analyze the level of wages of workers in research and development.



Source. Compiled by the authors on [4, 5].

Figure 3. Average monthly nominal wage, tenge

As can be seen from Figure 3, for 2012–2016, the average monthly nominal wage of specialists engaged in development is growing systematically, at the same rate as the average monthly wage of those working in the economy. Throughout the entire period, it can be noted that wages in research and development are significantly higher than those in the economy and in higher education. So in 2016, if the wage of those working in the economy was 101263 tenge, then in the field of research and development — 123560 tenge. Nevertheless, the wages of scientists in Kazakhstan are quite low, which does not attract young scientists to the field of science. Next, we analyze the costs of technological innovation by ownership according to table 3. Kazakhstani enterprises do not seek to do research and development independently and are not inclined to invest in the creation of new products. In this sense, even those enterprises that are engaged in the modernization of production are relatively inert. They prefer turnkey projects when technological solutions are already implemented in imported machinery and equipment.

In general, the analysis showed certain positive trends for 2012–2016. However, if we compare the results with the indicators of developed countries, then we have not yet reached a sufficient level of innovative activity of enterprises, and the efficiency of using the costs of technological innovation is not so significant.

The main reasons restraining the innovative activity of enterprises are the weak demand for innovation from industrial enterprises, a lack of financial resources for the development of science and innovation, and a shortage of highly skilled workers in high-tech sectors of the economy. In addition, the prevailing number of acquired new technologies over the number of transferred scientific developments and technologies, which indicates a low level of implementation of domestic scientific developments and technologies.

In our opinion, the state should pay more attention to mechanisms to stimulate the innovative activity of enterprises, then the latter will be interested in scientific development and research.

To solve these problems, institutional conditions are needed, in particular, improving the legislative framework and mechanisms of interaction between the state and the private sector, and the integration of science and production. In this regard, information and analytical support is of great importance, since the results of marketing and technological studies of markets and industries will help identify niches in international markets for Kazakhstani business. It is necessary to use the principles of coordination and motivation to coordinate the activities of all participants.

The main tool for innovative development should be government programs as complexes that are interconnected in terms of resources, time frames and executors of events, providing an effective solution to the most important scientific and technical problems in priority areas of economic development. Moreover, the formation of a national innovation system and information market, as well as the creation of modern means of communication, are important areas of stimulation and development of the domestic innovation economy.

This is due to the fact that for the creation and full functioning of the legal and regulatory system it is not enough to adopt a standard set of laws, it is also necessary to develop mechanisms and a structure for protecting legal norms that guarantee their mandatory implementation by all agents of the economy, including the state. Compliance with these principles requires systematic interaction among all participants in the innovation process.

It is necessary to create an effective national innovation system that would promote the promotion of innovation with the participation not only of industrial enterprises, but also of research, design organizations, financing and stimulation of which should be carried out in close connection with a set of measures throughout the entire research-production cycle. At the same time, the central role should be played by industrial enterprises, which form the demand for the knowledge economy, and it is they who transform knowledge into intellectual capital. It is no coincidence that Kazakhstan's lagging behind the global level in the development of industrial production is based not on a low level of research and development, but on a weak infrastructure of innovation and lack of motivation for producers to introduce innovations as a way of competition.

Thus, the innovative development of the manufacturing industry involves the formation of new technological systems by creating fundamentally new forms of organization and interaction mechanisms of all participants in the innovation process. At the same time, science acquires an innovative focus, and business — the role of an active participant in the knowledge economy. Society gains susceptibility and motivation for innovation, power structures activate the stimulation of the innovation process [7].

The place of any country in the global technological space is determined by an efficiently operating innovative system, that is, an effective system of institutions, which, with the help of its signals, allows you to create one or another brilliant technological achievement at the necessary time.

The structure of the innovation system includes entities (direct participants in the innovation processes and the institutions that regulate them), the innovation infrastructure and instruments of state support for innovation activities.

Participants in the innovation process are state development institutions, human resources in the field of science and development (state scientific organizations, scientific organizations at national companies, private research institutes, scientific personnel, research material and technical base), and the business sector (innovative enterprises, private investors and managers of innovative projects, business angels, venture funds).

The multisubjectivity of the innovation system ensures its stability, on the one hand, and inconsistency, on the other. Therefore, it is important both to create new institutions and to stimulate the reorientation of existing participants. In this regard, it is important to consider the state and development problems of the entrepreneurial sector, which in the future will become the leading subject of the innovation process in the country.

In Kazakhstan, the institutional foundations of a civilized innovation system have already been created. The legislative framework has been developed, the relevant development institutions have been created, and programs to support innovative activities have been adopted. The state acts as the main initiator, organizer and leader of the country's innovative development. Business cannot be considered as an equal partner yet; its activity is, rather, of a point-like nature. Despite this, there is an increase in the volume of innovative products (Table 2).

Table 2

The volume of innovative products in million tenge

2012	2013	2014	2015	2016	2017
156039,8	152500,6	111531,1	82597,4	142166,8	235962,7

Note. Compiled by the authors according to the Statistics Agency of the Republic of Kazakhstan, www.stat.kz.

In 2016, the volume of innovative products increased to 142,166.8 million tenge, which was a growth of 72.1 % compared to 2015, and in 2017 increased by 93,795.9 million tenge, or 60. 2 % compared to 2016.

In general, the state of innovation activity of Kazakhstani enterprises can be demonstrated by assessing changes in the main indicators of innovation activity (table 2).

A modern innovation system should be harmoniously represented not only by large innovative companies, but also in large numbers by small innovative enterprises. In developed countries over the past decades, the importance of small enterprises in the innovation sphere has grown, of the 58 largest inventions of the late 20th century (America and Western Europe), at least 46 belong to individuals, small firms, people who have not achieved recognition in large organizations, to innovators from reputable firms (but of a different profile). They are engaged in the development and experimental implementation of the results of research, where there is a high risk, for a while they become monopolists, and then either sell the rights to the goods or are absorbed. Large enterprises use small firms for pioneering work, and the authorities support this process with a system of special incentives. In the innovation sphere, on the one hand, the flexibility and initiative (enthusiasm) of small enterprises is used, and on the other hand, the financial and production capabilities of large enterprises. The advantages of small innovative enterprises are flexibility, the ability to quickly adapt to the new requirements of technological progress.

This is especially important in the context of deepening specialization and diversification of production, expanding the range of products, individualization of production and demand. Small innovative enterprises master the production of small-scale, unique products. With the development of scientific and technical progress, markets for new goods and services are constantly appearing, the capacity of which at first is small, does not require mass production. As the market is saturated, the primary demand for one or another type of consumer goods is satisfied, specific groups of buyers form specific requirements for a particular type of product. This leads to a demand for new models and modifications of existing products. Diversification of products requires new materials, new processing methods. As a result of the transition to small-scale and piece production from mass production, respectively, the optimal size of the enterprise decreases.

The construction and reprofiling of such enterprises require lesser costs that quickly pay off. There are opportunities in a short time to establish the production of new products on a modern technical basis. There is its own specificity in the forms of competition. Technological improvement of production is almost the only way to survive such enterprises. In addition, small innovative enterprises have fairly high indicators of the effectiveness of research work. In particular, the ratio of the number of innovations to the number of scientific personnel in them is 4 times higher than in large organizations, and the number of innovations per 1 dollar of research costs is 24 times.

Sources of financing for such structures are mainly specialized financial institutions. They are organized as partnerships that from various sources (funds of large corporations, banks, personal savings, pension and charitable funds, funds of insurance companies, donations, pension funds, etc.) form investment funds, used to support and lend to small investment enterprises.

Small innovative entrepreneurship is based on enthusiastic inventors. These people, obsessed with fundamentally new technical solutions, having created an experimental model of future serial production, need additional funds and are forced to turn to external sources for capital. If such sources are not found, then third parties enter the business, who are ready, with the appropriate serious scientific and commercial expertise of the product offered by the developers, to risk their own money to obtain high

profits. This greatly speeds up the process of creating a new instance. What could take 1.5–2 years, is carried out within 6–9 months.

In addition, a small innovative business has complete independence, enabling the company to freely change the scheme of work depending on the circumstances. This means the free choice of such research programs that are priority at the moment and give quick practical results. Everything must be subordinated to the achievement of the final effect.

The next advantage of this enterprise is related to the wide possibilities of qualified (talented) management in all areas of the company's functioning: from research to production and marketing of products.

Since small innovative entrepreneurship is very vulnerable, it needs government support like no other type of activity. In world practice, various forms of stimulation of small enterprises and individual investors have developed:

- direct financing (subsidies, loans), which reaches 50 % of the costs of creating new products and technologies (France, USA and others);
- the provision of loans, including without interest payments (Sweden);
- subsidies (in almost all developed countries);
- Creation of innovation introduction funds taking into account possible risks (England, Germany, France, Switzerland, Netherlands);
- non-repayable loans reaching 50 % of the costs of introducing innovations (Germany);
- reduction of state fees for individual inventors (Austria, Germany, USA, etc.);
- deferral of payment of duties or exemption from them, if the invention relates to energy saving (Austria);
- free record keeping at the request of individual inventors, free services of patent attorneys, exemption from payment of duties (Netherlands, Germany).

In Kazakhstan, a law was adopted to support small business, special programs have been developed, but no special support measures have been identified for small innovative business.

We believe that for the current stage of development of the economy and society of Kazakhstan, the characteristic processes are industrial modernization and the gradual transition on this basis to the post-industrial type of development, which has yet to establish itself in the world. Therefore, it is still necessary to develop and achieve widespread recognition of the concept of the formation of a post-industrial economy. The only reliable and realistic scenario for the long-term development of Kazakhstan is an innovative and breakthrough. The need for an innovative breakthrough scenario is dictated by the challenges of the 21st century, the economic imperatives of globalization and the effective resolution of critical situations that have arisen as a result of the modern recession of the world economy. In the context of the global economic recession and a decrease in the growth rate of reproduction efficiency, the establishment of a post-industrial technological mode of production, fifth and sixth technological modes requires a radical innovative renewal of the production apparatus (fixed capital), significant investments in innovation.

The innovative and breakthrough scenario proceeds from the fact that with the transition to a knowledge-based society, the establishment of a post-industrial scientific paradigm, it becomes possible to use a combination of favorable factors, quickly overcome the contradictions and dangers of the crisis period, and ensure the optimal trajectory of macroeconomic dynamics taking into account objectively existing constraints (primarily natural ecological and demographic).

This scenario can be considered moderately optimistic. Meanwhile, certain obstacles have ripened on the path of this process. Firstly, obsolete technologies are accumulated and spread in the world, which are imported on a large scale into countries of Eurasian civilization, including Kazakhstan in a modified form. A stream of pseudo-innovations, that is, improved technologies, but outdated, is growing. This impedes the implementation of the innovative and breakthrough scenario of the country's economic development and finds expression in a decrease in labor productivity growth rates. This critical situation can be resolved on the basis of growth in total investment in innovative economic renewal and their share in GDP, redistribution of investment in research and development, development of fifth and sixth technological innovations. Secondly, the critical situation of technological development in the countries of Eurasian civilization is manifested in the irrational structure of the economy and innovative and technological potential, which are focused on the priorities of industrial society and enhanced exploitation of nature. The solution to this critical situation can be found by restructuring the structure of the economy and its innovation and investment sector, increasing its share in GDP, focusing on the innovative development of human capital and resource-saving

technologies. Thirdly, the technological gap between the vanguard countries and most of the lagging countries, between the countries of Eurasian civilization and between the individual regions of these countries, is growing. This determines the low competitiveness of the products of lagging economies, the growing gap between wealth and poverty.

The main scientific, technical and innovative potential was concentrated in avant-garde civilizations — North American, Western European, Japanese. They spend on R&D 1.92 — 3.15 % of GDP (per capita — from 1726 to 3690 dollars), occupy key positions in the export of high technologies (Euro zone — 29.8 %, USA — 17.0, Japan — 9, 9 % of world exports). China caught up with the United States in terms of exports of high-tech goods (and, taking into account Hong Kong, it overtook the United States), but is significantly behind in the share of R&D expenditures in GDP (1.44 % versus 2.68).

Russia and Kazakhstan lost their leading positions in the field of scientific research during perestroika and the crisis. The share of science costs in Russia is almost half the global average (1.17 % versus 2.28 %), and the share in world high-tech exports does not exceed 0.3 %. The situation of Kazakhstan is even worse, here the costs of research and development are only 0.28 % of the country's GDP. The global economic crisis of the beginning of the XXI century. will widen the gap between countries due to the lack of the minimum necessary own scientific, personnel and investment potentials for the development of new technological structures [8].

The way out is in a partnership of avant-garde and lagging civilizations, advanced and developing countries, in order to bring together the level of their economic and social development. Fourth, a serious obstacle to the innovative development path is an acute shortage of personnel capable of effectively developing, mastering, producing and operating new technologies. We are talking about personnel at all levels of the technological chain — scientists, designers, engineers, technicians, skilled workers, managers, and civil servants. It is not a question of their quantity, but of the level of professional training, their ability to introduce radical innovations in their field of activity, associated with significant risk, but also with great success in the case of the successful formation and development of new innovative market niches.

In order to implement an innovative and breakthrough scenario for the development of the economy and society in Kazakhstan, an interactive approach based on assessing long-term trends in world economic and social development, using a set of interactive methods and identifying priority areas of domestic innovation activity is required. This approach involves the simultaneous use of a full set of project approach tools, stimulating economic growth, and progressive institutional transformations based on strengthening the role of the state and aimed at overcoming the negative consequences of the global economic crisis.

Thus, for the successful implementation of an innovative breakthrough scenario for the development of small innovative business in Kazakhstan, it is necessary:

- to apply a modern interactive approach based on assessing trends in long-term economic and social development on a global scale;
- use advanced technologies that enhance the competitiveness of products of domestic manufacturers;
- attract scientists to implement innovative projects that will enable Kazakhstani business to take a successful position in international markets;
- stimulate the innovative activity of small businesses, as this will increase the degree of interest in the scientific development of innovative technologies;
- develop mechanisms of partnership between the state, private business and society, while it would be advisable to use the principles of motivation and coordination, which would allow coordinating the actions of all participants.

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Қазақстандағы шағын инновациялық бизнестің қалыптасу мәселелері және даму келешегі

Мақалада инновациялық қызметті дамыту және белсенділігін арттыру, сондай-ақ Қазақстан Республикасы өнеркәсіп салаларындағы кәсіпорындардың инновациялық әлеуетінің негізгі мәселелері кеңінен анықталған. Мақала авторлары кәсіпорындардағы тікелей зерттеумен және әзірлеумен айналысатын қызметкерлердің санын сипаттайтын көрсеткіштерге талдау жүргізген. Авторлар кәсіпорындардың жаңа технологиялар саласындағы белсенділігін тежейтін негізгі себептерді ашып көрсеткен: өнеркәсіптік кәсіпорындардың инновациялық технологияларға сұранысының төмен деңгейінің болуы; инновациялық дамуға арналған қаржы қаражатының жеткіліксіздігі; ғылымды қажетсінетін салаларда жұмыс істейтін біліктілігі жоғары қызметкерлердің жоқтығы; жаңа енгізілімдерді енгізуде экономикалық субъектілердің арасындағы қызығушылық ынтасының болмауы; бизнес субъектілерінің инновациялық адами капиталды дамытуға бағытталмауы. Авторлардың пікірінше, шағын инновациялық бизнес жаңа технологияларды енгізу бойынша ерекше артықшылықтарға ие: техникалық үдерістің жаңа талаптарына бейімделу; өндірістің мамандануын тез әртарапандыру мүмкіндігі; шығарылатын өнімнің түрлерін кеңейту ікемділігі. Мақалада Қазақстанда шағын инновациялық бизнесті дамыту бойынша бірқатар ұсыныстар берілген: қазіргі заманғы интерактивті тәсілді қолдану; озық технологияларды пайдалану; инновациялық сипаттағы жобаларды енгізу үшін ғалымдарды тарту; шағын бизнес субъектілерінің инновациялық белсенділігін ынталандыру; мемлекет, жеке бизнес және қоғам арасындағы әріптестік қарым-қатынас тетіктерін әзірлеу.

Кілт сөздер: инновациялық бизнес, инновациялық даму, инновациялық қызмет, инновациялық белсенділік, технологиялық инновациялар, инновациялық әлеует, инновациялық өнім.

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Проблемы становления и перспективы развития малого инновационного бизнеса в Казахстане

В статье выявлены основные проблемы развития инновационной деятельности и активности предприятий, а также инновационного потенциала отраслей промышленности Республики Казахстан. Авторами проанализированы показатели, характеризующие предприятия и численность работников, занимающихся исследованиями и разработками. Выделены основные причины, сдерживающие активность предприятий в сфере новых технологий: низкий уровень спроса промышленных предприятий на инновационные технологии; недостаточность финансовых средств на инновационное развитие; недостаток работников с высокой квалификацией, занятых в наукоемких отраслях; отсутствие мотивации экономических субъектов во внедрении нововведений; неориентированность субъектов бизнеса на развитие инновационного человеческого капитала. По мнению авторов, малый инновационный бизнес обладает особыми преимуществами по внедрению новых технологий: адаптированность к новым требованиям технических прогрессов; способность быстро диверсифицировать специализацию производства; гибкость в расширении ассортимента выпускаемой продукции. В статье предложены рекомендации по развитию малого инновационного бизнеса в Казахстане: применение современного интерактивного подхода; использование передовых технологий; привлечение ученых для внедрения проектов инновационного характера; стимулирование инновационной активности субъектов малого бизнеса; выработка механизмов партнерского отношения между государством, частным бизнесом и обществом.

Ключевые слова: инновационный бизнес, инновационное развитие, инновационная деятельность, инновационная активность, технологические инновации, инновационный потенциал, инновационная продукция.

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