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B. Matayeva, c.e.s., associate professor[1]
A. Maralov*, PhD[2]
T. Kazbekov, c.e.s., professor[1]
A. Blyalova, master, senior lecturer[3]
Karaganda National Research University
named after academician Ye. A. Buketov, Karaganda, Kazakhstan[1]
L.N. Gumilyov Eurasian National University, Astana, Kazakhstan[2]
Karaganda University of Kazpotrebsoyuz, Karaganda, Kazakhstan[3]
* – main author (author for correspondence)
e-mail: arman_maralov@mail.ru

INNOVATIVE ACTIVITY OF TELECOMMUNICATION ENTERPRISES IN KAZAKHSTAN

The article considers the features of the development of innovative activities of telecommunications enterprises in Kazakhstan. Statistical indicators characterizing the innovative activity of enterprises in the industry, the volume of innovative products produced and sold, the cost of innovation and the effectiveness of their use are analyzed. The study was carried out on the basis of data from the Bureau of National Statistics of the Republic of Kazakhstan. The paper uses methods of statistical analysis, comparative analysis and generalization of industry indicators.

As a result of the research, the dynamics of innovation activity of telecommunications enterprises over a number of years has been analyzed. A decrease in the level of innovative activity of enterprises was revealed, while the volume of innovative products increased. The increase in the volume of innovative products produced and sold in the telecommunications industry is shown, reflecting the increasing role of technological solutions and digital services in the development of the industry. The dynamics of innovation costs is determined and the features of their changes during the study period are revealed. It shows an increase in the efficiency of using resources allocated to the innovative activities of industry enterprises, which is confirmed by an increase in the coefficient of return on innovation costs.

Based on the analysis, the main directions for improving the efficiency of innovation activities of telecommunications enterprises in Kazakhstan have been identified, including institutional, technological, investment and personnel factors in the development of the industry. The role of the telecommunications industry in the formation of the innovative potential of the economy and the development of the country's digital infrastructure is revealed. The practical significance of the results obtained for the development of measures to stimulate the innovation activity of enterprises and improve the policy of developing the digital economy of Kazakhstan is shown.

Keywords: *innovation, innovation activity, telecommunication industry, information and communication technologies, innovative activity of enterprises, innovative products, innovation costs, efficiency of innovation costs.*

Кілт сөздер: *инновациялар, инновациялық қызмет, телекоммуникация саласы, ақпараттық-коммуникациялық технологиялар, кәсіпорындардың инновациялық белсенділігі, инновациялық өнімдер, инновацияларға шығындар, инновациялық шығындардың тиімділігі.*

Ключевые слова: *инновации, инновационная деятельность, телекоммуникационная отрасль, информационно-коммуникационные технологии, инновационная активность предприятий, инновационная продукция, затраты на инновации, эффективность инновационных затрат.*

Introduction. The development of the telecommunications industry is gradually becoming one of the key factors in the technological modernization of the economy. Information and communication technologies form the infrastructural basis of the digital environment, ensure the functioning of modern markets and create conditions for the spread of innovations in various sectors of the economy. In scientific and practical terms, the telecommunications sector is considered not only as a communications industry, but also as a strategic platform for the development of the digital economy. The expansion of digital services, the modernization of telecommunications networks and the development of data transmission infrastructure form a new configuration of economic processes, increasing the importance of innovative activity of telecommunications enterprises.

The current stage of Kazakhstan's economic development is characterized by the active introduction of digital technologies and the expansion of the range of telecommunications services. Digitalization processes are accelerating, which strengthens the role of the telecommunications industry in ensuring sustainable economic growth. The practice of analyzing industry processes shows that the innovative activity of telecommunications enterprises is becoming an important factor in increasing the technological competitiveness of the economy and building the country's innovation potential. In the context of accelerated digital transformation, the study of the dynamics of innovation processes and the efficiency of the use of resources directed to the technological development of the industry is of particular importance.

Despite considerable attention to the issues of digitalization and the development of information and communication technologies, the problem of assessing the innovative activities of telecommunications enterprises remains of scientific relevance. Existing research is mainly focused on the institutional and technological aspects of digital transformation, while quantitative assessment of the innovation activity of enterprises and the effectiveness of innovation costs is limited. The lack of a comprehensive analysis of statistical indicators of innovation activity makes it difficult to form a holistic view of the trends in the development of the telecommunications sector.

The purpose of this study is to identify trends in the development of innovative activities of telecommunications enterprises in Kazakhstan. To achieve this goal, the following tasks have been set:

- analyze the dynamics of innovative activity of enterprises;
- evaluate the volume of innovative products, determine the effectiveness of innovative costs;
- to identify areas for improving the efficiency of innovation activities of telecommunications enterprises in Kazakhstan.

The methodological basis of the research is a set of general scientific and economic-statistical methods of analysis. The paper uses methods of comparative analysis, statistical generalization and analytical interpretation of industry data. The empirical base of the study is based on statistical information from the Bureau of National Statistics of the Republic of Kazakhstan, reflecting the indicators of innovation activity of enterprises in the Information and Communications sector. The use of statistical data processing methods has made it possible to identify the main trends in the innovative development of the telecommunications industry and to form an analytical basis for further generalization of the research results.

Literature review. The study of innovation activities of telecommunications enterprises is gradually taking a stable place in economics. The development of information and communication technologies forms the infrastructural basis of the digital economy and at the same time sets new parameters for the technological modernization of economic sectors. The analysis of scientific publications shows a steady interest of researchers in the issues of innovative development of the telecommunications sector, digitalization of communication infrastructure and the impact of ICT on economic development.

Scientific papers emphasize that the development of telecommunication technologies contributes to improving the efficiency of economic processes and creates conditions for the modernization of management and production systems [1]. A separate area of research examines the impact of the principles of environmental, social and managerial responsibility on the performance of companies in the industry. The results obtained indicate the relationship between the innovative development of telecommunications enterprises and the performance indicators of companies [2].

In domestic research, considerable attention is paid to the issues of digitalization of the telecommunications industry in Kazakhstan and the transformation of the structure of the communications market [3]. The role of digital technologies in the development of new forms of services and modernization of telecommunication infrastructure is emphasized. In a number of works, the innovative activity of enterprises is considered as an element of the broader process of digital transformation of organizations and increasing the efficiency of economic activity [4]. At the same time, the issues of telecommunication network management and the development of communication infrastructure as the basis for technological renewal of the industry are analyzed [5].

Recent studies also demonstrate a stable relationship between the development of ICT and economic growth, confirming the strategic role of digital infrastructure in shaping the innovative potential of the economy [6]. However, an analysis of the scientific literature shows the limited research devoted to quantifying the innovation activities of telecommunications enterprises. The dynamics of innovative activity of enterprises, as well as the effectiveness of the use of resources allocated to the innovative development of the industry, remain insufficiently studied. This circumstance determines the need for further research on the innovative activities of telecommunications enterprises in Kazakhstan based on statistical analysis of industry indicators.

The main part. The development of innovation in the telecommunications sector is of particular research interest, since this sector forms the infrastructural basis of the digital economy and at the same time acts as one of the most sensitive indicators of technological change. The practice of observing the development of the industry shows that the dynamics of innovations in the field of Information and communication reflects not only the level of technological modernization of enterprises, but also the nature of institutional and investment processes taking place in the national economy. In the context of accelerating digital transformation, the analysis of indicators that make it possible to assess the intensity of innovation activity, the volume of innovative products created, and the efficiency of using resources devoted to innovative development is of particular importance.

The empirical base of the study is based on statistical data from the Bureau of National Statistics of the Republic of Kazakhstan. As part of the analysis, the dynamics of key indicators of innovation activity of telecommunications enterprises for the period 2020-2024 is considered. The corresponding results are presented in table 1.

Table – 1

Dynamics of indicators of innovation activity of telecommunication enterprises in Kazakhstan*

Indicators	Years					Change, 2024/2020 +/-
	2020	2021	2022	2023	2024	
Innovative activity, %	17.7	15	12.7	11.3	12.8	-4.9
The volume of innovative products (goods, services) produced, million tenge	44978.8	38399	101599.3	97636.6	156708.5	111729.7
The volume of innovative products (goods, services) sold, million tenge	33588.1	43081.8	82988.2	104304	152122.8	118534.7
Innovation costs, million tenge	22786.4	24436.3	152317.9	94951.4	26534.2	3747.8
The share of innovative products in GDP, %	0.06	0.05	0.10	0.08	0.11	0.05
The coefficient of return on innovation costs, times	1.97	1.57	0.67	1.03	5.9	3.93

**compiled by the authors based on data source [7]*

The analysis of the data presented in Table 1 makes it possible to identify a number of characteristic trends in the development of innovative activity of telecommunications enterprises in Kazakhstan. First of all, attention is drawn to the decrease in the level of innovation activity of industry organizations. In 2020, the indicator was 17.7%, while by 2024 the level had decreased to 12.8%, reflecting a negative trend of 4.9 percentage points. This trend indicates a decrease in the share of enterprises involved in innovation processes. It is observed that innovation activity is concentrated in a limited number of large companies with significant technological and financial resources.

Despite the reduction in the innovative activity of enterprises, the volume of innovative products produced shows steady growth. In 2020, this figure was 44,978.8 million tenge, while in 2024 the value reached 156,708.5 million tenge. The increase over the period under review amounted to 111,729.7 million tenge. Such dynamics indicates an increase in the scale of innovative production in the telecommunications sector and reflects the increasing role of technological solutions in the development of the industry.

A similar trend is observed in terms of the number of innovative products sold. In 2020, the sales volume amounted to 33 588.1 million tenge, and in 2024 the value reached 152 122.8 million tenge. The growth amounted to 118,534.7 million tenge. The presented data allow us to conclude that the commercialization of innovative solutions in the telecommunications sector is significantly expanding. Practical observations show that the growth in the sale of innovative products is associated with the acceleration of digitalization processes, the expansion of telecommunications infrastructure and an increase in demand for digital services.

Particular attention is drawn to the dynamics of innovation costs. In 2020, the volume of investments in innovation activities amounted to 22 786.4 million tenge. By 2024, the indicator increased to 26,534.2 million tenge. At the same time, in 2022, a sharp increase in costs was recorded, reaching 152,317 million tenge. This dynamic reflects the intensification of investment processes in the telecommunications sector related to the modernization of digital infrastructure and the development of new technological solutions.

We believe that there will be a significant increase in innovation costs in 2022. This is due to the consequences of the COVID-19 pandemic, which accelerated the digital transformation of the economy and caused a significant increase in demand for telecommunications services.

An additional analytical value is provided by the indicator of the coefficient of return on innovative costs. In 2020, the value was 1.97, while by 2024 the indicator increased to 5.9. Such dynamics indicates a significant increase in the effectiveness of innovation activities of telecommunications enterprises. In practical terms, this means that for 1 tenge of innovation costs in 2024, 5.9 tenge of innovative products are created. We believe that this increase in efficiency reflects the increased technological specialization of the industry and the concentration of innovation activity in the most competitive companies.

The analysis of the dynamics of the share of innovative products in GDP also demonstrates positive changes. The value of the indicator increased from 0.06% in 2020 to 0.11% in 2024. The observed trend reflects the gradual strengthening of the role of the telecommunications industry in shaping the innovative potential of the Kazakh economy.

The conducted analysis allows us to draw a conclusion about the structural transformation of the innovation activity of telecommunications enterprises. The reduction in the level of innovation activity is accompanied by an increase in the volume of innovative products and an increase in the efficiency of innovation costs. Such a combination of indicators indicates the formation of a model of concentrated innovative development of the industry, in which large technology companies are beginning to play a key role.

The identified trends lead to the need to develop areas for improving the efficiency of innovation activities of telecommunications enterprises, which requires a systematic consideration of institutional, technological and investment factors in the development of the industry. The relevant recommendations are shown in Figure 1.

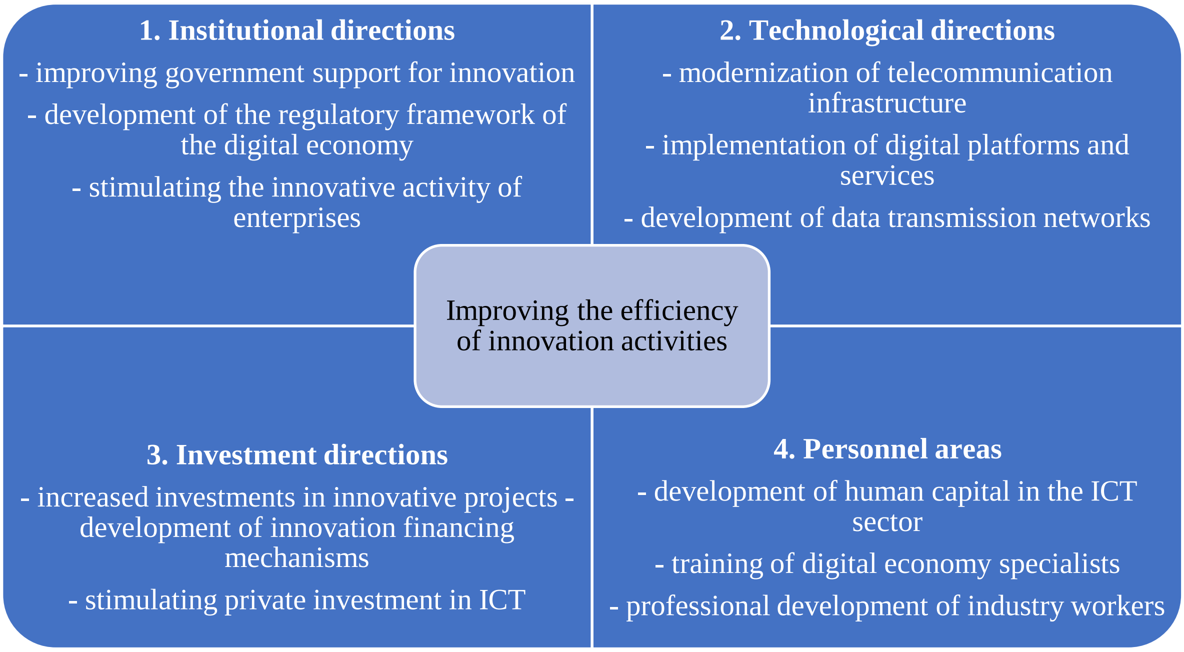

Figure – 1. **The main directions of increasing the efficiency of innovation activities of telecommunications enterprises in Kazakhstan***

**compiled by the authors*

The scheme presented in Figure 1 summarizes the key areas for improving the efficiency of innovation activities of telecommunications enterprises in Kazakhstan. The conceptual logic of the model reflects the interrelation of institutional, technological, investment and personnel factors that form the basis for sustainable innovative development of the industry. The proposed structure focuses on improving the efficiency of innovation activities of telecommunications enterprises, around which the basic directions of transformation of the industry innovation environment are grouped.

The institutional block reflects the importance of the regulatory and organizational conditions for the functioning of the innovation system. The practice of observing the development of the digital economy shows that the sustainability of innovation processes is largely determined by the quality of the institutional environment - the level of government support, transparency of regulatory mechanisms and stimulation of innovative activity of enterprises. We believe that strengthening the institutional infrastructure of innovation can create favorable conditions for long-term technological renewal of the telecommunications sector.

The technology unit focuses on the modernization of telecommunications infrastructure and the introduction of new digital solutions. The development of data transmission networks, the expansion of digital platforms and the improvement of technological equipment of enterprises form the basis for the innovative growth of the industry. The observed dynamics of innovative products, discussed earlier, confirms the importance of the technological factor as one of the key drivers of innovative development.

The investment block reflects the need for sustainable financing of innovative projects. Innovation in the telecommunications sector is characterized by high capital intensity, which requires the development of investment attraction mechanisms and the formation of long-term sources of financing for innovative initiatives. We believe that increased investment support for innovation can accelerate the technological modernization of the industry.

The personnel component of the model is of particular importance. The development of human capital in the field of information and communication technologies forms the basis for the introduction of innovative solutions and increasing the technological competitiveness of enterprises. The training of digital economy specialists, advanced training of industry workers and the development of professional competencies are considered as the most important conditions for the sustainable innovative development of the telecommunications sector.

The formed model of directions for improving the efficiency of innovation activity allows for a systematic interpretation of the results of the statistical analysis and reflects a set of factors determining the prospects for innovative development of enterprises in the telecommunications industry in Kazakhstan. The considered provisions create an analytical basis for summarizing the research results and formulating the final conclusions presented in the conclusion.

Conclusion. The conducted research allowed us to form a holistic view of the current state and features of the development of innovative processes in the telecommunications sector of Kazakhstan. The analysis of industry-specific statistical indicators has shown the presence of structural changes in the innovation activities of enterprises in the telecommunications industry in Kazakhstan. Against the background of a decrease in the share of enterprises involved in innovation, there is an increase in the scale of innovative products created and an increase in the effectiveness of the use of resources allocated to technological development. This trend reflects the increasing role of the most technologically advanced companies in shaping the innovative potential of the industry.

The scientific novelty of the research consists in a systematic assessment of the dynamics of innovation activity of telecommunications enterprises based on industry statistical indicators and the identification of factors characterizing the effectiveness of the use of innovative resources. The results obtained make it possible to clarify ideas about the transformation of innovation processes in the telecommunications sector and identify key areas for improving the efficiency of innovation activities of industry enterprises.

The practical significance of the research lies in the possibility of using the results obtained in the development of government and corporate policy measures aimed at stimulating the technological development of the telecommunications industry. The presented conclusions and recommendations form the basis for improving the mechanisms for supporting the innovative activity of enterprises and can be used in shaping strategies for the digital development of the economy. It is advisable to focus further research on an in-depth analysis of the factors determining the innovative activity of telecommunications enterprises.

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Матаева Б.Т., Маралов А.К., Казбеков Т.Б., Блялова А.К.

ҚАЗАҚСТАННЫҢ ТЕЛЕКОММУНИКАЦИЯ САЛАСЫ КӘСІПОРЫНДАРЫНЫҢ ИННОВАЦИЯЛЫҚ ҚЫЗМЕТІ

Аңдатпа

Мақалада Қазақстанның телекоммуникация саласы кәсіпорындарының инновациялық қызметін дамыту ерекшеліктері қарастырылған. Сала кәсіпорындарының инновациялық белсенділігін, өндірілген және сатылған инновациялық өнімнің көлемін, инновацияларға жұмсалатын шығындарды және оларды пайдалану тиімділігін сипаттайтын статистикалық көрсеткіштер талданды. Зерттеу Қазақстан Республикасы Ұлттық статистика бюросының деректері негізінде орындалды. Жұмыста статистикалық талдау, салыстырмалы талдау және салалық көрсеткіштерді жалпылау әдістері қолданылды. Зерттеу нәтижесінде телекоммуникация саласындағы кәсіпорындардың бірнеше жылдағы инновациялық қызметінің динамикасы талданды. Инновациялық өнім көлемінің бір мезгілде өсуімен кәсіпорындардың инновациялық белсенділігі деңгейінің төмендеуі анықталды. Телекоммуникация саласында өндірілген және сатылған инновациялық өнім көлемінің ұлғаюы көрсетілген, бұл саланы дамытудағы технологиялық шешімдер мен цифрлық сервистердің рөлін күшейтуді көрсетеді. Инновацияларға жұмсалатын шығындардың динамикасы анықталды және олардың зерттелетін кезеңдегі өзгеру ерекшеліктері анықталды. Сала кәсіпорындарының инновациялық қызметіне бағытталған ресурстарды пайдалану тиімділігінің артуы көрсетілген, бұл инновациялық шығындардың қайтарылу коэффициентінің өсуімен расталады. Жүргізілген талдау негізінде саланы дамытудың институционалдық, технологиялық, инвестициялық және кадрлық факторларын қамтитын Қазақстанның телекоммуникациялық саласы кәсіпорындарының инновациялық қызметінің тиімділігін арттырудың негізгі бағыттары айқындалды. Телекоммуникация саласының экономиканың инновациялық әлеуетін қалыптастырудағы және елдің цифрлық инфрақұрылымын дамытудағы рөлі анықталды. Кәсіпорындардың инновациялық белсенділігін ынталандыру шараларын әзірлеу және Қазақстанның цифрлық экономикасын дамыту саясатын жетілдіру үшін алынған нәтижелердің практикалық маңызы көрсетілген.

Матаева Б.Т., Маралов А.К., Казбеков Т.Б., Блялова А.К.

ИННОВАЦИОННАЯ ДЕЯТЕЛЬНОСТЬ ПРЕДПРИЯТИЙ ТЕЛЕКОММУНИКАЦИОННОЙ СФЕРЫ КАЗАХСТАНА

Аннотация

В статье рассмотрены особенности развития инновационной деятельности предприятий телекоммуникационной сферы Казахстана. Проанализированы статистические показатели, характеризующие инновационную активность предприятий отрасли, объемы произведенной и реализованной инновационной продукции, затраты на инновации и эффективность их использования. Исследование выполнено на основе данных Бюро национальной статистики Республики Казахстан. В работе использованы методы статистического анализа, сравнительного анализа и обобщения отраслевых показателей.

В результате исследования проанализирована динамика инновационной деятельности предприятий телекоммуникационной сферы за ряд лет. Выявлено снижение уровня инновационной активности предприятий при одновременном росте объемов инновационной продукции. Показано увеличение объемов произведенной и реализованной инновационной продукции в телекоммуникационной отрасли, что отражает усиление роли технологических решений и цифровых сервисов в развитии отрасли. Определена динамика затрат на инновации и выявлены особенности их изменения в исследуемый период. Показано повышение эффективности использования ресурсов, направляемых на инновационную деятельность предприятий отрасли, что подтверждается ростом коэффициента отдачи инновационных затрат.

На основе проведенного анализа определены основные направления повышения эффективности инновационной деятельности предприятий телекоммуникационной сферы Казахстана, включающие институциональные, технологические, инвестиционные и кадровые факторы развития отрасли. Выявлена роль телекоммуникационной отрасли в формировании инновационного потенциала экономики и развитии цифровой инфраструктуры страны. Показано практическое значение полученных результатов для разработки мер стимулирования инновационной активности предприятий и совершенствования политики развития цифровой экономики Казахстана.