The Role of Innovation-Investment Mechanisms in the Commercialization of Scientific Research Results in Azerbaijan

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Received:03.08.2026 Accepted: 22.08.2026 Published: 07.09.2026
https://doi.org/10.54414/PYUQ9467

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Abstract
The article examines the role of innovation-investment mechanisms in the commercialization of scientific research results in Azerbaijan. The processes of efficient organization of scientific research and commercialization of their results are analyzed. The importance of developing and implementing new functional mechanisms in an environment of accelerated development of science and technology is substantiated. The advantages of digital transformations were noted. The importance of using artificial intelligence tools was stated. The problems of developing, adopting, and applying innovations in universities were examined. The possibilities of expanding university-state-industry cooperation were considered. The processes taking place in countries of the world related to the application of high technologies were analyzed, and attention was paid to advanced practices. The exceptional role of technoparks in organizing scientific research and applying their results to production processes was noted. The advantages and characteristics of technoparks as multifunctional economic spaces were given. The attractiveness of technoparks in the development of high technologies and in attracting related investments was brought to attention. The work done in the direction of organizing Scientific Research in Azerbaijan was analyzed and evaluated. The steps taken and measures taken to improve the legislation and create an innovation system in the country were presented. The increased interest in the implementation of new educational programs and the creation of innovation centers in universities was reported. The measures taken to improve Azerbaijan's economic development model were noted. The digital economy strategy was approved, and the adoption of an action plan to intensify digital transformation was noted as a positive aspect. The priority of using artificial intelligence tools in the country was noted. The main priorities of state policy towards improving the innovation and investment climate in Azerbaijan were announced. The positive aspects of the application of high technologies, including “smart” technologies, in the liberated territories were given. Recommendations and proposals were made for the most efficient organization of scientific research in Azerbaijan in the near future and the development of mechanisms for the commercialization of its results.

Keywords: Azerbaijan, science and technology, scientific research, universities, industrial entities, innovation, investment, innovation-investment mechanisms, commercialization

1.Introduction

In the context of modern global transformations, the development of science, more efficient organization of scientific research, and application of its results are of exceptional importance. In recent years, serious importance has been attached to the development of science and the intensive application of technologies in Azerbaijan. In this regard, concepts, strategies, and state programs are being adopted. National Priorities have been defined in our country for the period up to 2030 (Azerbaijan 2030: National

Priorities for Socio-Economic Development, 2021). At the same time, the Strategy for the Development of the Digital Economy in the Republic of Azerbaijan for 2026–2029 was approved by the Decree of the President of the Republic of Azerbaijan dated December 10, 2025 (Strategy for the Development of the Digital Economy in the Republic of Azerbaijan for 2026–2029, 2025). In addition, by the Decree of the President of the country dated February 27, 2026, the Action Plan for Accelerating Digital Development in the Republic of Azerbaijan for 2026−2028 was adopted (Action Plan for Accelerating Digital Development in the Republic of Azerbaijan for 2026−2028, 2026). Also, by the Decree of the President of the Republic of Azerbaijan dated March 19, 2025, the Artificial Intelligence Strategy of the Republic of Azerbaijan for 2025–2028 was approved and is being implemented (Artificial Intelligence Strategy of the Republic of Azerbaijan for 2025–2028, 2025). All this shows that successive steps are being taken by the state for the development of science and technology in Azerbaijan.

The Azerbaijani economy is entering a new stage of development. The transition to a high-tech economic development model based on the efficient use of national resources is one of the important tasks (Samadzadeh, Z.A., 2021). For this, large-scale scientific research should be conducted, and its results should be used effectively.

It is extremely important to organize the activities of scientific research institutions in Azerbaijan in accordance with the requirements of the modern era and to demonstrate the unity of science and education, to increase interest in Scientific Research (SR) in scientific research institutions and universities, to conduct fundamental research in the direction of the problems of the era, and to take additional stimulating and motivation-increasing measures in this regard. Currently, the funds allocated for scientific research in our country are very small, and in terms of the capabilities of the funds or relevant organizations in this field, there are not many alternative options for allocating financial resources to scientific research. And those that do exist are capable of ensuring scientific research in a very limited direction.

On the other hand, the level of education in universities, the organization of education based on world experience, the creation of scientific research centers, and the conduct of fundamental scientific research are still at the initial stage. Although these works have become relatively intensive in some universities of the country, it can be said that in most universities, it is very difficult to note the intensification of scientific research work and the development and application of mechanisms for the commercialization of the results of scientific research in this direction. Of course, as a result of the reforms carried out in the country's leading higher education institutions and the Azerbaijan National Academy of Sciences, new conditions have been created. Also, the subordination and structural form of relevant specialized scientific research institutes and institutions in many scientific research areas have been changed, and at the same time, a significant part of such institutions has been transferred to the subordination of the newly established Ministry of Science and Education. As a result, the prospects for a more integrated development of relations between science and research institutions and universities, expansion of relations, and conducting joint research have significantly increased. In this regard, it is necessary to ensure the formation and development of relations, the identification of commercialization problems between the country's scientific research institutions and universities, and the implementation of effective measures to apply the results of scientific research to production and service processes (Silich, V.A. & Silich, M.P., 2011).

In modern Azerbaijan, the role of science is determined by the need for socio-economic development of the state. The qualitative and quantitative increase in the results of intellectual activity, which is expressed in the form of various scientific and technical products, should ensure the development of innovative business and contribute to the increase in its volume. For this, there must be a certain provision of resources. Currently, one of the most important tasks in the provision of resources for scientific research is to expand the participation of business in financing science and increase the specific weight of extra-budgetary funds in the total amount of financing for scientific research and experimental and design work. It is also necessary to gradually increase the budget funds for scientific research and innovation, as well as attract additional

financial resources from the business sector by creating attractive opportunities for joint financing of scientific research and innovation projects. Public-private cooperation should be given priority in this area.

It should be noted that the modern stage of improving the work of industrial enterprises is characterized by the fact that the main productive force of its development is Scientific Research activity. This area of activity of industrial enterprises is currently distinguished by the attraction of a fairly large amount of investment. It is appropriate to divide Scientific Research work into two components: on the one hand, it includes applied research work, and on the other hand, experimental design work. At the same time, applied research work includes work in search of new scientific directions and work of experimental and theoretical planning. They are carried out in industrial enterprises to determine the technical feasibility of creating new types of equipment and technologies within a certain period of time.

Ensuring innovation and investment attractiveness in Azerbaijan is not an easy task. As we have noted, the processes of forming a national innovation system have not yet been completed in the country, or a network of innovation centers and technological centers has not been formed in our country (Cavadov, X.R., 2015). We also believe that very few companies operate in this area, or the appropriate innovation infrastructure has not been formed. Although the economic development processes in the country are proceeding rapidly, there are initiatives related to the transfer of new technologies from abroad (Shekaraliyev, A.Sh. & Shekaraliyev, Q.A., 2016). However, our conclusion is that in terms of investment and innovation attractiveness, problems still remain in Azerbaijan.

2. Research Results

It should be noted that digital mechanisms and artificial intelligence tools play an exceptional role in the efficient organization of scientific research. Digital mechanisms have brought new advantages in the in-depth analysis and objective assessment of problems in these areas (Gasimli, V. et all, 2023). On the other hand, it is necessary to look at these issues in a broader perspective from the point of view of consolidating the activities of the country's scientific research institutions and universities and forming and developing their relations with industrial entities, strengthening ties with relevant investment and innovation funds, expanding cooperation at the international level, and finally, from the point of view of the experience of companies that better organize the processes of commercialization of the application of scientific research works to production processes in terms of world technologies and innovations. The systematization of recent studies and publications made it possible to define the term commercialization of scientific research results as a complex economic and legal category, which expresses the processes of organizing and implementing the transfer of intellectual property objects and scientific research results to the real sector. Despite the large number of publications on the analyzed issues, there is a need to study in depth the mechanism of commercialization of scientific research results in universities and the role of innovative infrastructures in this area.

At the current stage of economic activity, the condition for sustainable innovative development is the preparation and production of competitive innovative products that are the result of scientific and technical development (Shafa Aliyev et all, 2023). The development of scientific and technological achievements and their ability to be applied to production are becoming the main factor in ensuring the competitiveness of the national economy operating in the global environment. In this regard, it is appropriate to present the sphere of scientific and research work as a specific production area that produces a specific product, that is, intellectual property objects. Against the background of global trends, the issues of organizing and conducting high-quality scientific research, increasing the demand for local innovations, obtaining maximum income from the application of technologies, and using effective strategies for the commercialization of local scientific and research work are in the spotlight. The problem may lie in the lack of demand for innovations, in the insufficiently effective supply of the scientific research sector, and in the unreliable processes of transfer and commercialization of scientific research. Commercialization of scientific research can help solve the problem of entering the market with developed innovations. Currently,

one of the main criteria for economic development is the creation of competitive products based on the latest technologies, but the state of the scientific research sector shows that the business sector does not spend enough money on scientific research. This leads to a lag in patenting compared with the leading countries of the world (Karpov, A.V., 2021). We also believe that the scientific results obtained should be useful and their productive use in various sectors of the economy should be ensured.

Considering the characteristics of the domestic market of scientific research, it can be seen that there are a number of problems related to the possibilities of their commercialization. Including the lack of attractiveness of the scientific research market and insufficient skills in the field of investment analysis, marketing, and intellectual property management. One of the current problems is the choice of the method and mechanism for commercialization of scientific research results (Kholiavko, N., 2018). The author is right in a certain sense, since the creation of innovative structures will create favorable conditions for the faster application of important results of scientific research to the economy. In our opinion, the University creates conditions for researchers to realize their creative potential. At the same time, students, masters, and doctoral students are involved in scientific and production activities; they acquire not only theoretical knowledge, but also practical skills. Creating income-generating structures is one of the important conditions for the commercialization of the results of scientific research work of universities. Important steps should be taken to create favorable conditions for the commercialization of the results obtained from scientific research work. Currently, universities often face a number of exogenous and endogenous economic and financial problems in the processes and activities of commercialization of scientific research results.

In order to solve these problems in Azerbaijan, it is important to create a solid base of economic and legal foundations for the commercialization of the results of scientific research of universities and to properly develop tax incentives in this area.

The effectiveness of the application of the mechanism for the commercialization of the results obtained by universities during scientific research requires the identification of potential commercialization objects and their maximum inclusion in commercial circulation (see Table 1).

Table 1. Classification of universities' scientific research results as objects of commercialization

s.s	**Classification group**	**Types**
1.	According to the type of activity it belongs to	1) fundamental research; 2) applied research; 3) research and development; 4) teaching and methodological developments.
2.	For obtaining scientific research results	1) long-term (more than 3 years); 2) medium-term (1-3 years); 3) short-term (up to 1 year); 4) used in current activities.
3	By funding sources	1) external financing (grants from international organizations and funds); 2) state financing (public procurement, targeted programs, state funds); 3) private financing (venture investment, joint ventures, sale of rights, sale of services); 4) mixed financing; 5) creation of endowment funds (investment funds financed by donations (including graduates of higher education institutions as donors).
4.	Depending on the customer	1) at the initiative of the scientist; 2) to meet the internal needs of the higher education institution; 3) by state order; 4) under a contract with the business sector.
5.	Depending on the commercialization method	1) transfer of research results (sale of rights, creation of a small innovative enterprise, transfer of research results to the customer under a contract); 2) internal use (in the educational process, in further research activities, in the provision of services, etc.)

Note: The table was compiled by the author.

We can show the mechanism of commercialization of scientific research results of universities as consisting of five logical stages:

Stage I - taking into account the influence of institutional, scientific-technical, financial and economic factors in commercialization processes; identification of market needs and their adaptation to the profile of scientific research institutions; objective assessment of existing scientific-technical resources and their commercial attractiveness; identification of potential financial sources of scientific research activities;

Stage II - conducting marketing research; preliminary selection of ways to commercialize the results of planned research; preliminary assessment of the commercial potential of the results of planned research; identification of existing financial sources; search for potential customers; organization and implementation of scientific research works;

Stage III - accounting and inventory of scientific research results; technical, economic and commercial audit; financial management; innovativeness, competitiveness, commercial potential and commercialization methods; grouping of scientific research and improvement results according to criteria;

Stage IV - ensuring legal protection of scientific research results; patenting of inventions in national and foreign patent offices; support for the validity of patents;

Stage V - search for ways to transfer rights to scientific research results; commercialization process; obtaining income from the transfer of scientific research results, achieving economic and social impacts.

Taking into account the economic importance of commercialization of scientific research results obtained at universities, it is necessary to make changes to the legislation in this area. We also share this opinion, especially considering the importance of improving the legislation related to innovation activities and the application of scientific research results.

In the modern era, we have provided a block diagram of the main stages and links of the process of commercialization of the results of scientific research activities at universities in Figure 1.

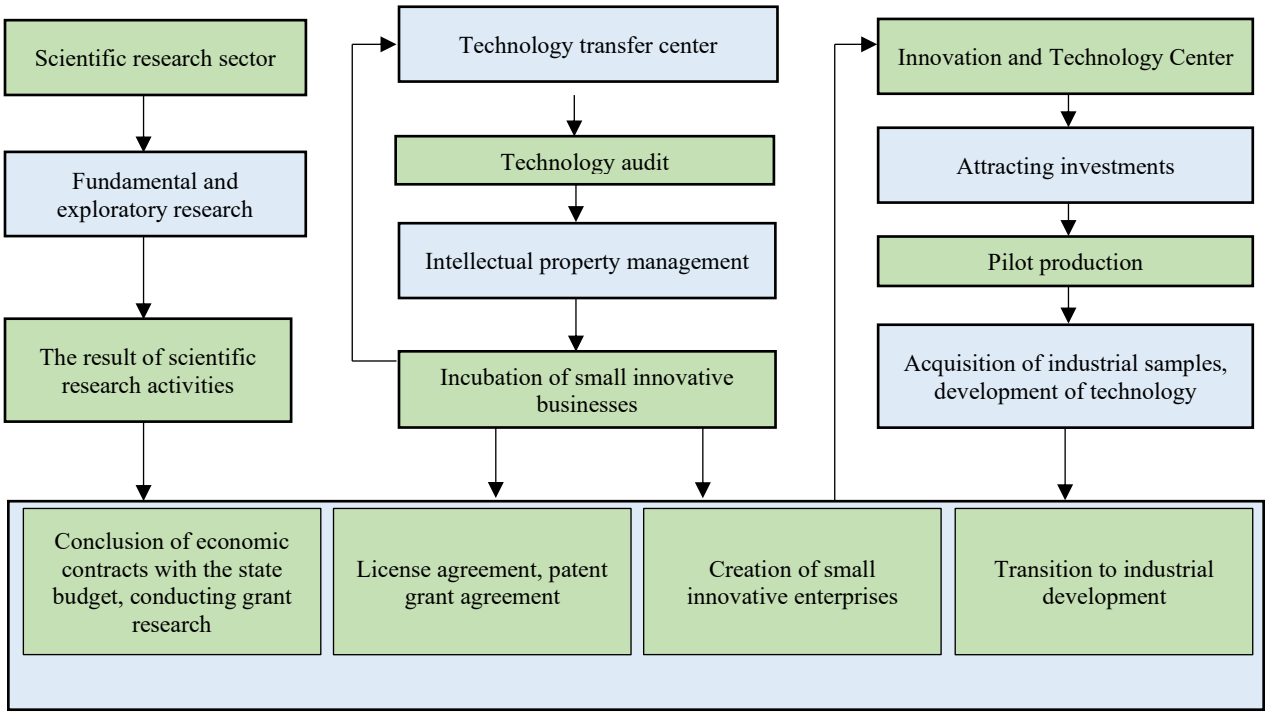


Figure 1. *Block diagram of the main stages and links of the process of commercialization of the results of scientific research activities in universities in the modern era (Source: prepared by the author).*

The organization of the process of commercialization of scientific research results in universities should be considered comprehensively, taking into account factors covering organizational, informational, and

financial-economic aspects. For this purpose, it is proposed to develop a system of organizational and economic support for the process of commercialization of scientific research results, based on the legislation of the country and the interaction of subsystems: organizational and informational support; marketing; financial and economic support; accounting. These subsystems are designed to solve the main tasks in enterprises and organizations engaged in the commercialization of scientific research results, namely: determining the predominant forms of commercialization of specific scientific research results; systematizing financial flows arising in the process of using the results of scientific research and identifying additional sources of income; increasing the efficiency of accounting and evaluation of the results of scientific research at the enterprise; creating conditions for new competitive advantages; increasing the efficiency of legal protection of the results of scientific research (Larin, S.N. & Ostrovsky S.M., 2012). Undoubtedly, strong legal protection of the results of scientific research and the effectiveness of related laws are important conditions.

Currently, a completely different situation is observed in some economic and humanitarian universities of Azerbaijan, where support for these universities is not so obvious. Naturally, scientific developments carried out in such universities are significantly different in nature from high-tech projects developed in technical universities. Orders for Scientific Research within the framework of state-specific programs also have a clear technical and technological focus. Nevertheless, studies show that state and business structures today need developments that can be implemented at a high level by the country's leading economic universities. There is a need to design a mechanism for interaction between the university's scientific community and industrial partners, as well as develop a quality assurance strategy through the creation of such a structure of research centers that would stimulate the activities of employees in higher education institutions.

It should be noted that an important incentive for universities to commercialize Scientific Research may be their desire to obtain the status of research universities, for which it is necessary to increase the share of income from the sale of Scientific Research results. It is difficult for universities with an economic and humanitarian orientation to compete with technical universities or universities with a “mixed” profile, since the scope of their scientific activities is significantly limited (Gorbashko, E.A. et all, 2018). We believe that the researcher is right, since the mentioned services are in sufficient demand. Technoparks are the largest scientific research and production complexes that create the most favorable environment for the development of small and medium-sized innovative companies, mainly engaged in organizing the transformation of Scientific Research results into commercial products and their application in production (Aliyev, Sh.T., 2012). Therefore, in our opinion, there is a need to create a wide network of technoparks. Thus, the work of technoparks should be coordinated with promising innovative business entities, research institutions, or higher education institutions to increase the competitiveness of national products in the field of high technologies.

In order to organize a solid production base of the national economy and expand the production structure in this regard, new economic mechanisms and economic tools are actively used in the country. For these purposes, the processes of creating and accelerating the activities of technoparks, industrial districts, agroparks, as well as special economic zones deserve attention (Aliyev, A.G. & Shahverdiyeva, R.O., 2020). We believe that, taking into account the above, the application of the processes of commercialization of scientific research results in these areas would have a great effect. For this, the cooperation of these infrastructures with universities should be expanded. The technopark is a platform equipped with the necessary industrial and technological infrastructure, which makes it possible to accelerate the implementation of scientific research on its territory and the application of the results of such research to production (Belova, V.V. et all, 2020). We also believe that technoparks allow for the rapid application of modern technologies. On the other hand, a favorable environment is created in the higher education institution that contributes to the development of new technologies and the formation of creative teams of scientists. Technoparks attract students, postgraduates and teachers of educational institutions, and scientific workers of scientific research institutes, who have the ability not only to receive

and impart theoretical knowledge on a scientific-production basis, but also to apply their innovative ideas in practice by demonstrating creative thinking. Ideas and entrepreneurial skills can be tested and applied within the technopark. The creation and development of technoparks in educational institutions serves to increase the prestige of the university and its innovative status in the region. At the same time, the technopark is able to absorb the creative activity of young specialists who can subsequently organize high-tech production in the region. High-tech projects and startups are tested in technoparks, which is possible thanks to preferential taxation. Regions should also be interested in the creation of technoparks. Because their work serves business development and provides additional funds to the budget. In addition, industrial enterprises in the regions should also be able to develop new technologies in their production base, obtain competitive products, and show interest in the activities of technoparks by identifying the demand for this type of product in the market (Mukhamediev, B. & Ilyasova, Zh., 2018). Therefore, technoparks are able to increase the commercial activity of an educational institution by providing a number of services in both the educational and industrial sectors. This is due to the fact that the organization of high-tech production directly creates an opportunity for the training and retraining of personnel for large industrial enterprises in the region. The activities of technology parks ensure the attraction of budget funds to educational institutions through scientific research.

When creating a technopark, its direction of activity should be determined individually, taking into account the work profile of the educational institution and the capabilities of the personnel. In general, ensuring the quality of scientific research activities in universities can be viewed from the point of view of the satisfaction of all interested parties. In order to determine the constituent elements of this task, in our opinion, it is necessary, first of all, to organize a monitoring procedure for competitions and grants announced for scientific applied research, and to study the market demand for such developments.

It should also be noted that a significant part of scientific research is an unfinished product (in terms of its subsequent application on the market), and it is necessary to provide a whole complex of measures to ensure that the results of scientific research are competitive. Another way to solve the problem of commercialization of the results of the university's scientific activity may be the organization of an information system, the tasks of which are to inform the market about the potential for possible use of the results of scientific activity.

In terms of increasing the innovation-investment attractiveness of the commercialization of scientific research results, it should be noted that at present, increasing the innovation and investment attractiveness of the processes of commercialization of scientific research results is of great relevance. It is known that before investing, specialized transnational companies and large investment and innovation fund associations, whose potential investors are engaged in investment at the global level, study the problems in this area and factors that hinder the increase in the attractiveness of investments, as well as the level of investment if it is invested; special importance is given to these factors. Therefore, we believe that the commercialization of scientific research results and more active application of their results to production processes are required; additional measures are taken in this regard, including the development of financial mechanisms and the introduction of state support mechanisms and incentive mechanisms. At the same time, by increasing the attractiveness of innovation-investment measures, it is possible to more promptly commercialize and involve scientific research results in production processes in scientific research institutions and universities of the country. In this case, the main goal and approach are to identify the financial mechanisms required for the conversion of scientific research results, and to what extent the proposed mechanisms and economic activity tools can be used and be useful. Intensively directing scientific research results to production processes and at the same time, sufficient financial resources and investments are required for the development of projects, the gradual implementation of innovation adoption and application processes (Aliev, Sh.T. et all, 2021).

In an innovative economy, modern economic reality determines the winner in the competitive struggle of enterprises that are constantly improving the organizational, technical, and technological components of production. This is facilitated, first of all, by the introduction of innovative business processes that are

relevant for the current period and are aimed at changing and modernizing manufactured products. In competitive conditions, many enterprises try to achieve significant results based only on old fixed assets, without ensuring technological improvement, without updating the intellectual component of production. In some cases, despite the presence of design bureaus in their structure, enterprises do not pay attention to the development of innovative products that provide competitive advantages in terms of quality, price, and other parameters. In these conditions, these enterprises should actively participate in innovative activities, and their priority interest should not be the acquisition of added value, but the production process itself, in which the results of Scientific Research are involved. In this case, their activities are accompanied by high productivity.

In modern times, many factors, including material and technical factors, have a special impact on labor productivity of various enterprises (Aliyev, Sh.T., 2010). They include everything that allows for increasing the technical level of production, including the application of innovative business processes. In this case, productivity growth is achieved through the use of achievements of scientific and technical progress, innovative business processes, increasing the efficiency of the use of raw materials, energy sources, increasing the level of mechanization of production and its comprehensive modernization. However, in increasing labor productivity, in addition to intensifying the modernization of fixed assets, their qualitative and technical renewal should also play a key role. Along with all this, the development and expansion of scientific and research services also have a significant impact on increasing productivity. Like any service, a service in the field of Scientific Research has its own characteristics. According to the provisions of services marketing, the following main characteristics are distinguished, which should be inherent in all services in one way or another, distinguishing them from goods. Such features are intangibility, inseparability, instability and non-permanence. The services provided in the field of Scientific Research can also be characterized from another point of view. For example, according to the criterion of participation in the purchase and sale processes, the services provided by scientific research organizations are both market and non-market in nature (Zavyalova, T.A., 2010). The service component of innovation is becoming increasingly important in various fields of activity. An important place in the set of domestic Scientific Research organizations belongs to the academic sector of the scientific research field.

Experimental research is research based on knowledge obtained as a result of scientific research or practical experience, carried out with the aim of protecting people's life and health, creating and improving new production processes, materials, products, devices, and services. Fundamental research is a theoretical and experimental activity aimed at obtaining knowledge about the laws of development of nature, society and people. For example, the study of human behavior patterns in economic decision-making situations can be classified as fundamental. Applied research is an activity aimed at obtaining and using knowledge to solve applied problems arising in the field of human practical activity (Skorev, M.M. et all, 2017). There are various fundamental approaches to improving the education-science-production chain in Azerbaijan. Taking into account the existing human resource potential, material and technical base, and innovation-based development opportunities of Azerbaijan, real conditions are created for the integration of educational institutions of our country with science centers and scientific research institutes. Today, in developed countries, universities are primarily formed as research centers and the educational process is based on scientific innovations. Universities are formed as research and education centers that meet the needs and demands of society. Today, our universities must fulfill such a mission in order to integrate into the globalized world.

Scientific research can be characterized as a set of knowledge about society, nature and the universe, consisting of systematized explanations and predictions that can be directly or indirectly confirmed through scientific experiments, and scientific activity can be characterized as activities aimed at expanding this knowledge. The general drawback of the field of Scientific Research services in Azerbaijan is its weak innovation orientation. Currently, the level of development of high-tech production, innovative development of enterprises, and the state as a whole is the most important element of the future successful development of the country. At the same time, the organization of financing of Scientific Research works

plays an important role. It is precisely effective mechanisms for financing Scientific Research works that allow developing industry and increasing the level of innovative development of companies, regions and the state.

In order to increase interest in Scientific Research and the development of innovations in enterprises, measures should be taken to commercialize the results of Scientific Research and their acceptance by enterprises, and attention should be paid to the mutual efficiency of business processes in this area. Consistent approaches should be provided for the development of innovative mechanisms and new innovations and their application in a scientific research laboratory or elsewhere. First, there should be a concept for the formation and development of an innovation system at the national level, and its development strategies should be determined. Second, measures should be taken for the active application and implementation of Scientific Research results. Then, the necessary analysis and study of innovative business processes in which Scientific Research services are formed should be carried out, a system of indicators should be determined, and a methodology for their assessment should be developed.

Currently, an important feature of the development of the national economy is the formation of a socio-economic system in which innovation activity plays a dominant role as a factor ensuring a higher level of competitive advantages. Both state and private large enterprises actively participate in innovation activity. The state assumes the functions of legislative regulation of innovation activity, implementation of large, fundamental, and socially significant projects, stimulation of private business for the application of innovations, and direct support of innovative enterprises, especially small ones. Thus, the state directs the development of the country's economy in an innovative way. As for the incentives used by the state for the development of innovations, they are quite diverse: tax breaks, provision of preferential loans, subsidies, public procurement, knowledge and technology transfer, accelerated depreciation, and others. Innovation business is stimulated based on the characteristics and state of economic development of a particular country.

In the conditions of uncertainty characteristic of the modern economy, increasing the competitiveness of economic entities is possible only when they develop innovatively (Маркова, Е.В., 2014). This means increasing the volume of innovative research and development in the country, and the introduction and commercialization of technological innovations. Management of innovative activity in the service sector should be associated with certain predictable results, leading both to a serious transformation of the management process within the service-producing enterprise and to significant changes in the external environment. For example, an increase in the requirements for the consumer value of a service may be associated with an increase in effective demand. Such changes lead to the fact that service providers are forced to expand and update their range. Any activity related to the service sector is determined not only by the consumer value characteristics of the services produced, but also by socially significant indicators such as the standard of living and quality of life of the population, health status, and economic entrepreneurship. In fact, the service sector is a system whose elements are aimed, on the one hand, at promoting various activities, and, on the other hand, at satisfying the needs of the population. The role of the service sector in the modern economy is due to the fact that the fundamental factors of economic growth are formed in this sector, namely: new scientific knowledge, intellectual capital, information technologies, financial sector services, consulting (Abbaszadeh, M.T., 2020). It follows from this that large-scale scientific and technical, qualitative and structural changes in service areas, which are of great importance for the further development of the economy and improving the quality of life of the population, are relevant.

The difference between fundamental research and applied research stems from Let's consider some stages of Scientific Research in more detail. It is known that Scientific Research services are based on Scientific Research stages. The implementation of research results, which is the final stage of scientific research, based on innovation processes, is the main factor for increasing its efficiency. Ensuring the efficiency of Scientific Research services is related to the legislation adopted in this field. In recent years, a number of laws, strategies, and priorities have been developed in the direction of expanding the structure

and increasing the volume of Scientific Research services in Azerbaijan. One of these laws is the "On Science" Law that we mentioned at the beginning, and in terms of the main functions and roles of that law, we can distinguish the following: increasing the effectiveness of the influence and role of science in solving socio-economic and cultural problems; optimization and stabilization of activities of scientific, scientific-technical and technological organizations, protection of scientific and scientific-technical potential; creation of necessary organizational and material-technical conditions for scientific-research organizations; provision of social security for employees working in the field of scientific research. On the other hand, that law regulates the processes of financing a group of scientific and technical activities: 1) fundamental research and improvements; 2) projects on the priority directions of science and technology development; 3) nationally important applied scientific developments; and 4) scientific projects in accordance with interstate contracts and agreements (Ahmedova, L.F., 2021). This law is important in terms of stimulating the development of innovative business by influencing the expansion of the structure and volume of scientific research services in Azerbaijan.

The goals set for them. Fundamental research includes activities aimed at identifying the most important regularities of the development of both nature and society, explaining phenomena and processes, gaining a more complete understanding of the object under study, and expanding human knowledge. The use of the results of fundamental research in practice is not immediately set as a task, and no attention is paid to making a profit. These studies form the basis of modern technologies and allow for innovations. When conducting fundamental research, ideas and innovative projects are created. In the innovation process, fundamental research is of great importance because it generates ideas and opens up previously unknown areas of knowledge (Ahmadova, L.F. 2020).

In modern conditions, one of the strategic issues facing universities is to train qualified specialists, as well as to form a wide range of competitive Scientific Research services and introduce them to the knowledge economy market. A multifunctional innovative infrastructure is required for the high-level organization of the Scientific Research services market, and the creation of this infrastructure requires the implementation of targeted and consistent measures. Judging from world experience, it can be noted that innovative approaches are of great importance in expanding scientific research services at universities.

It is also possible to note the formation of conceptual approaches to the problems of expanding Scientific Research services at the university level in Azerbaijan, and targeted measures have already been taken in this direction. In this regard, increasing the role of business processes in the diversification of scientific research services, creating an innovative infrastructure that allows the development and application of innovations, and attracting investments to these areas are important issues at the present time (Aliyev, Sh.T., 2018). In addition to the bachelor's level, higher education institutions operating in the country train personnel at the master's and doctoral levels. Doctoral studies, being the highest level of higher education, ensure the training of scientific and scientific-pedagogical personnel, the improvement of specialties and scientific degrees (Ahmedova, L.F., 2022). It is at this level that the training of future promising scientific researchers and the training of scientific specialists who are quite important in the formation of Scientific Research services takes place. At the same time, taking necessary measures in this direction to regulate the processes of preparing Scientific Research services and introducing them to the knowledge economy markets is an important condition for holding strong scientific events, conferences, planning and coordinating targeted scientific research in the direction of more relevant scientific research services, and achieving the study and application of progressive world experience in the field of science. Another important issue is that measures should be taken to ensure the integrative activities of universities, relevant research institutes of the Azerbaijan National Academy of Sciences, and innovation-oriented production enterprises and business entities (Mehtiyeva, N.Z., 2018). We believe that in order to apply Scientific Research services to production processes in reality, the formation and development of an innovative infrastructure network such as technoparks and industrial clusters should be given special attention.

In recent years, the state has attached great importance to the development of innovative infrastructure in Azerbaijan, and the creation of technoparks, industrial parks, industrial districts, agroparks, and high-tech parks has already begun. Many such science- and innovation-oriented infrastructure facilities and enterprises are already operating. Universities have the potential to actively participate in the formation of Scientific Research services and their introduction to the science and technology markets through integrative relations with such innovative institutions and economic entities. Another important issue is the role and activity of universities in the preparation of scientific research services and the organization of innovative infrastructure in the context of the challenges arising from the new industrial revolution.

It should be noted that the efficient organization of business processes is of particular importance for all areas of activity, including the scientific research field (Fletcher, AC. & Bourne, P.E., 2012). Thus, in order to form scientific research services as a final product, the operational delivery of them to the application processes for their intended purpose and the receipt of the final product, such measures as conducting tests, organizing production processes, studying markets, assessing risks, conducting marketing research, etc., are essential conditions. In general, in countries that are highly developed in terms of science and technology, direct investments are made for these purposes, and large amounts of financial resources are allocated, grants are established, and other large-scale measures are taken. Optimal organization of business processes and systematic measures taken in this regard are essential conditions. This requires taking complex measures and implementing interrelated operations, forming production, scientific, and management staff. At the same time, in the process of applying the results of any Scientific Research activity, it is necessary to go through various stages to organize the business process, formalize resources, provide auxiliary materials, and build and test production facilities (Caulfield, T. et all, 2012).

We would like to note the importance of paying more attention to measures to implement scientific results obtained in universities, research-oriented enterprises and centers through business processes and to increase investment attractiveness in this regard. The main approach here is to create appropriate conditions for researchers to operate productively and apply their scientific results in production and service processes, and to involve professional managers and potential investors in these processes, which ultimately are of decisive importance. Among these measures, we would like to note the most noteworthy: 1) organizing targeted Scientific Research grants and ensuring transparency of related competitions; 2) selecting potential and talented researchers, specializing them in various promising projects and forming professional research groups and teams; 3) holding serious scientific discussions and forums on important and priority problems; 4) taking necessary measures and creating appropriate conditions for testing and preparing research materials for application; 5) strengthening relations with stakeholders, including industrial enterprises, financial and credit institutions and investment associations, holdings, and implementing joint projects, etc. In addition, it is required to put the management circles of business processes into operation, form a control system, assess the level of adaptability of scientific and research results, and significantly and objectively assess the practical contributions they can make (Koltsova, O.V. & Menshchikova, V.I., 2008).

Improving the optimization of business processes and, in this regard, raising investment attractiveness to the required level are characterized as important issues. This can also be considered an indicator of the level of competitiveness of an entrepreneurship or business entity that applies the results of Scientific Research to production processes. In this case, business processes will look more attractive to investors, and the necessary decisions will be made when making investments, and investors will be more interested parties. Modeling the activities of business entities in accordance with new challenges directly depends on their level of competitiveness and maneuverability potential. Along with this, strengthening the infrastructure in Scientific Research institutions, increasing the level of the material and technical base, purchasing necessary equipment, especially laboratory testing devices, and creating appropriate conditions for experiments and tests should be given more priority and should be considered consistently..

A group of business processes related to the organization of the production cycle, which plays a decisive role in the practical application of scientific research results, attracts more attention. For example, if we pay attention to the main business processes, here the income of the enterprise is formed, and purposeful

processes related to the production of goods and the provision of services are carried out. On the other hand, if we look at the characteristics of indirect business processes, we can see that in this case the formation of additional income in the production cycle related to the goods produced and the services provided is more in the spotlight. At the same time, from the point of view of auxiliary business processes, we are witnessing a process that includes the problems of providing the necessary resources, goods, and materials, and issues related to the organization of activities. Along with these, as for the essence of another type of business processes, namely, supporting processes, issues related to strengthening and supporting the production and service infrastructure come to the fore. Development business processes, on the other hand, involve the improvement of goods and services, and the development of technologies. At the heart of entrepreneurial business processes, first of all, are issues of managing the entire cycle of goods and services, and related processes are implemented. Finally, the regulatory business process combines rules and requirements in the cycle of production and services (Burtsev, D.S. et all, 2021). In view of the above, in recent times, the formation of types of business processes based on high technologies, including "smart" technologies, and the emergence of more modern activity models are noteworthy. At the heart of all these processes are the mechanisms of activity related to information and communication technologies, which are predominant.

It can be noted that the state attaches great importance to the development of innovative infrastructure in Azerbaijan, and in recent years, the processes of creating technoparks, industrial parks, industrial districts, agroparks, and high-tech parks can be cited as an example of this; as we have said earlier, there is a need to intensify these processes. Thus, it is precisely at the expense of the potential of that production infrastructure that it is possible to expand the processes of commercialization of scientific and research works. Many science- and innovation-oriented infrastructure facilities and enterprises have already been put into operation, and currently, ensuring the efficient use of using this infrastructure and ensuring that universities and scientific and research institutions benefit more productively from those high-tech-based economic mechanisms remain relevant as important tasks.

In recent years, broad prospects have been formed, and a favorable environment has been created in our country for strengthening the activities of Scientific Research Institutions. Azerbaijan already has 3 communication satellites, and there are real and accessible digital resources for using the capabilities of high technologies. At the same time, the liberation of our lands that have been under occupation for nearly 30 years and the launch of large-scale projects aimed at revitalizing these territories, especially the use of high technologies, including "smart" technologies, and green economy approaches, necessitate the implementation of new Scientific Research. In addition, the newly created Karabakh and East Zangezur economic regions have sufficient underground and surface resources. The establishment of Scientific Research institutions in these economic regions, the formation of temporary and permanent scientific creative teams, and the organization of mobile scientific expeditions, if necessary, have become extremely relevant. We believe that in the near future, the opportunities for expanding Scientific Research and commercializing its results in Azerbaijan will increase significantly.

3. Conclusion

Thus, there is a serious need to maximize the improvement of scientific research and strengthen the stimulating mechanisms in this direction. We have summarized a group of our proposals in this regard:

– Based on modern challenges and digital transformations, there is a need to increase the level of scientific research and intensify measures for the active commercialization of scientific and practical results obtained in these processes, and in this regard, the preparation and implementation of action mechanisms for the activities of scientific research institutions and centers in the country and the active commercialization of scientific research results at universities should be accelerated.

– In order to make the Scientific Research and Innovation environment in Azerbaijan as attractive and efficient as possible, conceptual approaches should be provided at the state level and, in order to strengthen the legislative framework, it is important to adopt a national law "On Innovation Activities". In

addition, legislative acts that include the expansion of the processes of commercialization of Scientific Research results should be developed and actively implemented.

– The state's policy in the field of science and education should take into account the realities of the modern era and, first of all, the systematic consideration and implementation of measures aimed at applying science to production should be reflected in this policy. The state should continuously allocate funds and invest in conducting scientific research. Special attention should be paid to increasing interest in scientific research and regulating the activities of specialized scientific research centers, institutions and structures in this field, and ensuring the effectiveness of state support mechanisms in this regard.

– We believe that there should be a mechanism to motivate the arrival of a new generation, that is, the younger generation, in Scientific Research work; appropriate resources should be allocated, and conditions should be created for the productive conduct of Scientific Research work, the creation of infrastructure, a strong material and technical base, and the experimental testing of research results.

– The issues of commercialization of scientific research should be at the forefront of the legislation of each state and the measures that must be implemented in this regard, and it is important to have perfect mechanisms in this direction. Taking systematic measures to implement scientific research and provide comprehensive support for related work, increasing the interests of scientific research institutions, and identifying favorable scientific research projects that will attract the interest of special funds, scientific and educational funds and investors in this regard should be under the special control of the state, and in this regard, “public-private sector” cooperation should be strengthened in the direction of the activities of specialized scientific research institutions.

– Commercialization of scientific research should be based on clear mechanisms, and in addition to state support mechanisms, it is necessary to ensure that the legislation is functional and that an environment free from bureaucracy is created in the related mechanisms. In order to organize international cooperation in a broader way to strengthen scientific research, the establishment of modern innovative and high-tech universities, scientific research institutions, science and technology centers, and specialized institutions engaged in technology transfer should be given special consideration.

– Mechanisms for the establishment of specialized centers engaged in the commercialization of scientific research results in Azerbaijan should be developed and the establishment of such centers, including in the regions of the country, should be ensured. It would be appropriate to create an information portal reflecting the scientific research methods operating in the country and the scientific research results obtained at universities, as well as proposals, inventions, and discoveries of industrial and commercial importance, and to provide an open database to entrepreneurs, business structures, and interested organizations in this regard.

We can note that in the modern era, the implementation of complex tasks related to the generalization of Scientific Research results, their consideration in practical activity processes, and taking measures for their commercialization is of great importance. In this regard, in the near future, there is a serious need to take complex and systematic measures in Azerbaijan to create mechanisms for the application of high technologies in accordance with international experience and to effectively commercialize Scientific Research results.

Author Contributions

The sole author is responsible for conceptualizing, collecting, and analyzing data, and writing and editing the manuscript

Conflict of Interest

The authors declare no conflicts of interest.

Funding

This study received no external funding.

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