

REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

**IMPROVEMENT OF INNOVATIVE
ACTIVITY IN THE CIVIL AVIATION SYSTEM
OF THE REPUBLIC OF AZERBAIJAN**

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THE WORK'S GENERAL CHARACTERISTICS

Relevance of the topic. In modern times, innovative development is the main means of providing economic benefits to countries. The leading countries in terms of GDP per capita (USA, Singapore, Switzerland, etc.) have achieved high economic results precisely due to the widespread use of innovative technologies. A comprehensive analysis of statistical data shows that countries that follow the path of innovative development significantly outperform countries whose economies are based on natural resources in terms of competitiveness.

Since the post-Soviet states, including the Republic of Azerbaijan, functioned in the administrative-command system for many years, they lagged far behind the world standards of innovative development. Obviously, the conditions for innovative development are created only in a market economy. Of particular importance is the production of competitive products (provision of goods and services), which plays a key role in obtaining a certain segment of consumer markets in various sectors of the economy. Through the application of innovations, economic entities that produce (goods and services) and sell a quality product with the same (or adequate) function of its counterpart at a low price, have the opportunity to increase their market share and, accordingly, their profits.

In the post-Soviet space, the formation and practical application of innovative ideas began to be observed to a greater extent in countries that quickly ensured the transition to a market economy and created real competitive conditions in the market. Among them, the Republic of Azerbaijan has more favorable conditions, since, along with rich natural resources, it has a scientific and technical potential that can sufficiently stimulate innovation. Among them, the Republic of Azerbaijan has more favorable conditions, as it is rich in natural resources and has scientific and technical potential, which can adequately promote innovation. The structure of the scientific and technical potential, which has been formed in our country over many years, meets the requirements of the innovative development of the economy and has created the possibility of accumulating rich innovative experience in a number of industrial

enterprises.

As a result of the successfully pursued economic policy in Azerbaijan, an economic system based on the principles of a market economy, integrated into the global economic system, has been formed. The benefits of the oil industry have created a real basis for the dynamic development of the non-oil sector. In general, the rapid development of the country's economy was ensured as a result of the wise policy of the national leader Heydar Aliyev after concluding contracts with the world's leading oil companies. President of the Republic of Azerbaijan Ilham Aliyev, who successfully implemented the ideas of Heydar Aliyev, pursued a comprehensive socio-economic policy to restructure the country's non-oil sector, achieved stable and sustainable development of the service sector, including civil aviation.

Civil aviation enterprises operate in a competitive environment with enterprises in their field, on the one hand, and with enterprises of other modes of transport, on the other. Of course, ensuring competitiveness is directly related to the use of modern innovative technologies. That is why the expansion of innovation in transport in general, including civil aviation, which is one of its main areas, is considered an important factor in increasing the level of profitability of airlines. It is very important that the civil aviation product (transport service) be innovatively oriented, since civil aviation activities are multifaceted, include various areas, and therefore it is necessary to carry out a wide range of research and development work (R&D). Such scientific research should cover both theoretical issues and the practical application of modern innovative technologies. Increased innovation also reduces the cost of civil aviation services and increases their profitability.

In these research cycles, the study of the world experience in organizing innovation activity becomes very relevant. Thus, a broad study of foreign experience and the possibilities of its application in the field of civil aviation creates a scientific and practical basis for the innovative development of the national economy.

It should be noted that the government and the scientific community of the Republic of Azerbaijan have always paid special attention to the issues of innovative development of the economy. Certain

incentive and regulatory measures have been implemented towards the organization of research and development. However, the inability of economic and institutional reforms to give the necessary results in the face of modern challenges requires the creation of a favorable environment for the innovative development of the national economy and the improvement of the mechanism of state regulation. In this regard, the challenges associated with improving the mechanism of innovation management in all areas of the economy, including in the field of civil aviation, are of particular relevance and determine the choice of the topic of the dissertation.

The degree of knowledge of the topic. The problems associated with the innovative development of the economy attracted the attention of famous world economists at the end of the 19th century. The first scientific work in this area was published by the Austrian scientist J. Schumpeter in 1912, in which the concept of innovative development of the economy was put forward. The studies of the Russian scientist N.Kondratiev, reflecting the wave nature of economic processes, as well as scientific articles of S.Kuznets gave a powerful impetus to the development of innovative theory. Further development of the theory of long waves is associated with the names of American and European scientists I. Delbeke, P. Drucker, B. Twiss and B. Santo, as well as Russian and Ukrainian researchers I. N. Lukashevich, B. Ya. Onoprienko, K. M. Misko. , E.B. Avseniev and others. Various aspects of the theory of innovation, including the issues of managing and financing innovation, as well as improving the efficiency of applying the achievements of science and technology in production, were discussed in the works of Russian scientists A.I. Anchishkin, K.I. Taksir, G.A. Lakhtin, P.N. Zavlin, I.N. Yakovets and others. And the social aspects of innovative activity are reflected in the studies of A.I.Prigogine.

Articles by Azerbaijani economists Z.Samedzade, A.X.Nuriyev, A.B.Abbasov, T.A.Guliyev, F.N.Gasimov, E.M.Hajizade, T.I.Imanov, N.A.Garayev on the issues of innovative development of the national economy, innovative management and innovative activity have been published. However, unlike the works of the mentioned scientists, this dissertation is the first research work on the topic ““Improvement of in-

novative activity in the civil aviation system of the Republic of Azerbaijan”

Goals and objectives of the research. The main purpose of the dissertation is to study and summarize the theoretical and methodological aspects of innovation management and develop scientifically based proposals and recommendations in the direction of improving the mechanism of state regulation of innovation in the civil aviation system.

To achieve this goal, the following tasks were identified and solved:

- explanation of the scientific and theoretical foundations and socio-economic essence of innovation;
- the advanced experience of foreign countries in the field of innovations and innovative development of the economy was studied and the possibilities of its application in Azerbaijan were determined;
- comprehensively analyzed the current state of the organization of innovative activities in the civil aviation system.
- the classification of innovations in the civil aviation system has been clarified and the promising directions of their development have been substantiated;
- proposals have been developed for planning innovative activities in the civil aviation system in the context of modern conditions;
- The necessity of formation of innovation clusters for the expansion of innovation activity in the civil aviation system has been substantiated;
- the expediency of applying the model of public-private business partnership in ensuring innovative development in the civil aviation system is substantiated.

The object of the research is the civil aviation system of Azerbaijan and its enterprises.

The subject of the research is the totality of economic and social relations that arise in the process of organizing innovative activities in the civil aviation system of Azerbaijan.

The theoretical and methodological basis of the research are the works of the classics of economic science and leading economists, the laws of the Republic of Azerbaijan, decrees of the President of the

Republic of Azerbaijan, resolutions and orders of the Cabinet of Ministers, normative and adopted regulatory legal acts on the development of the transport sector, "The Strategy for the Social and Economic Development of the Republic of Azerbaijan in 2022-2026".

In the process of research, systemic and comparative analysis, logical generalization, program-based approach and other methods are used.

The information base of the research is made up of materials of the State Statistics Committee of the Republic of Azerbaijan, reports of Azerbaijan Airlines CJSC (AZAL CJSC) and its enterprises, information resources of the global Internet network and personal observations of the researcher.

The scientific novelty of the research is as follows:

- various scientific and theoretical approaches and conceptual ideas about the concepts of innovation and innovation activity, their socio-economic essence have been studied and appropriate generalizations have been made;

- the experience of advanced foreign countries in the field of organization of innovative activities was studied and the possibilities of applying this experience in the civil aviation system of Azerbaijan were determined;

- The current state of innovation activity in the field of civil aviation in Azerbaijan has been comprehensively analyzed, unresolved problems have been identified and priority areas of innovation activity have been substantiated;

- the restraining influence of economic, production and other groups of factors on the expansion of innovation activity in the civil aviation system was assessed;

- a methodology for planning innovation activities in the civil aviation system in the face of modern challenges has been developed;

- substantiated directions for improving the mechanism of innovation management in the civil aviation system;

- an effective mechanism of public-private business partnership was proposed to ensure innovative development in the civil aviation system

Practical significance of the research. The practical significance

of the work lies in the fact that its main provisions, the results obtained, the proposed proposals and recommendations can be used in civil aviation, in the organization of innovative activities of AZAL JSC, in the evaluation and selection of innovative projects. It can also be useful in the development of targeted state programs to stimulate the sustainable development of civil aviation and improve the efficiency of air transportation. The materials and results of the dissertation work can also be used in the educational process in subjects at the Faculty of Economics and Law of the National Aviation Academy.

Approbation and application. The main provisions and results of the dissertation work were reported and published at the Republican scientific conference "Problems of innovation-oriented economic development in the Republic of Azerbaijan and ways to solve them", held by Sumgayit State University together with the Institute of Economics of the National Academy of Sciences of Azerbaijan (2010), "Socio-economic aspects of problems innovation development" at the international conference, at the International scientific-technical conference "Avia-2011", held in the Republic of Belarus, at the The 6th International Youth Scientific and Practical Conference "February Readings 2021: The creative potential of youth in solving aerospace problems" organized by the National Aviation Academy.

The author has published 8 scientific articles and 3 theses in conference materials in prestigious journals of Azerbaijan and foreign countries.

Structure and scope of the dissertation: Introduction (14330 symbols), three chapters (chapter I - 95520 symbols, chapter II – 68456 symbols, chapter III – 52536 symbols), conclusions (15920 symbols) and bibliography. The study is 160 pages long and has 256437 symbols.

The structure of the dissertation

Introduction

Chapter I. Theoretical and methodological foundations of the organization of innovative activity

- 1.1. Scientific and theoretical approaches to innovation
- 1.2. The essence of innovation activity and its determining factors
- 1.3. World experience in organizing innovation activities

Chapter II. Organization and planning of innovation activities in the civil aviation system of Azerbaijan

- 2.1. Features of the organization of innovative activities in the civil aviation system
- 2.2. Planning of innovation activities in the civil aviation system in the context of modern challenges

Chapter III. Directions for improving the management of innovative activities in the civil aviation system

- 3.1. Improving the mechanism of state regulation of innovation activities in the civil aviation system
- 3.2. Directions for the development of public-private business partnership in the management of innovative activities in the civil aviation system

The result

Bibliography

List of abbreviations

MAIN PROVISIONS PROVIDED FOR DEFENSE

Dissertasiya işinin yeniliklərini özündə əks etdirən aşağıdakı müddəalar müdafiəyə çıxarılır. The following provisions of the dissertation work are defended.

1. The concepts of "innovation" and "innovative activity", study of various scientific and theoretical approaches and relevant generalizations about their socio-economic nature and role in increasing the competitiveness of the national economy.

The concepts of "innovation" and "innovative activity", their socio-economic nature, the study of various scientific and theoretical approaches and relevant generalizations about their role in increasing the competitiveness of the national economy.

Theoretical and methodological issues of innovation activity have not been studied enough, which creates certain difficulties in making effective management decisions on issues of innovative development at the level of the country, industry and enterprise.

Industrial enterprises applying technological innovations have a very low share in the total number of industrial enterprises and the share of innovative products in the total industrial product, as well as in the export of high-tech products and the share of the innovation sector in GDP. According to the State Statistics Committee of the Republic of Azerbaijan, the share of an innovative product in the total industrial product was only 0.01% in 2007 and 0.08% in 2020. The analysis shows that industrial enterprises do not show sufficient interest in the application of technological innovations. Thus, in 2005, the amount of spending on technological innovations was only 53,273,000 manats (of which 80.8% came from the state budget), and in 2020 it decreased to 35,920,000 manats.

The statistical reports of industrial enterprises indicate a number of reasons for the low interest in innovation (high cost of innovation, lack of own funds, lack of skilled workers, etc.). There are also certain gaps in the legal protection of innovation processes: a national law regulating innovation activity has not been adopted, the concepts of “innovation” and

“innovation activity” are not defined in the legislation, and the subjects of this activity are not defined. However, the successful steps taken in the field of innovation in Azerbaijan ensured the progress of our country from year to year according to the Global Innovation Index (GII) prepared by the World Intellectual Property Organization. For example, in 2021, Azerbaijan ranked 74th out of 132 countries in the Innovative Resources sub-index of this index, 91st in the Innovative Results sub-index, and 80th in the overall GII. According to the integral indicator "Creation of knowledge" in the block "Knowledge and technological results", our country has advanced by 6 steps over the past 2 years.

Taking into account the existence of different opinions among economists about the concepts of "innovation" and "innovative activity", the author proposed an approach in which it is advisable to clarify the term "innovative activity" and consider other concepts derived from it. At the same time, the definition of the concept of "innovative activity" should cover all its areas. The dissertation considers numerous points of view on innovative activity in the economic literature, and the concept of "innovative activity" is given the following definition: Innovative activity is the process of developing ideas, methods, inventions, technologies and methods for creating a new product (goods, services), technologies, production or organizational and managerial forms, their initial testing, practical application, satisfaction of public demand and the formation of social and economic benefits from diffusion. This definition reflects both the main aspects of innovation and its goals, and focuses on the necessary conditions for this activity - the development of scientific and technical ideas and their implementation in the form of a new product (goods, services), technology, production or organizational or management method that satisfies new public demand and bringing socio-economic benefits. This approach makes it possible to clearly define the objects and subjects of management and financing of innovation activities.

Innovation activity, being an effective form of reproduction processes, not only leads to an increase in financial and economic indicators due to the discovery of hidden development resources and a reduction in current costs, but also increases the competitiveness of the national economy and its individual industries, commercial activities of

economic entities and positively affects the business image. It follows that the factors influencing innovation activity differ depending on the level at which this activity is considered (at the level of the national economy, its industry or enterprise). Among scientists-economists there are even those who suggest that innovative development at the regional level has different factors and it is important to analyze these factors separately. Given that not all economic areas are covered by the economy of individual regions, it is more correct to accept that the results of the study of innovative development of regions will be local in nature and focus more on research at the three levels mentioned above.

2. Identification of the factors that determine innovation activity and assessment of their impact on the innovation development of the national economy based on their comprehensive analysis.

Factors that determine innovation activity can be divided into two groups, which are in different directions. One of them activates the process of introducing advanced technologies into production, ensures the spread of innovations across the borders of countries, industries and markets (progressive factors), and the other, on the contrary, slows down innovative activity or brings this activity to a state of stagnation (destructive factors), i.e. such a state is being created that technologically developed countries continue their socio-economic development due to evolutionary and revolutionary technological changes, and the technological backwardness of developing countries is growing, which hinders the introduction of technological innovations throughout the world.

The transition of the national economy to sustainable innovative development requires the elimination of the negative impact of destructive factors on this process. To do this, those factors should be specified taking into account their strength, scale and duration of impact. As many researchers note, one should not lose sight of the fact that the influence of some universal factors (for example, innovative infrastructure) on the innovative development of the national economy can be both stimulating and opposite.

The Republic of Azerbaijan is going through a stage of active

innovative economy. One of the most important conditions for this stage is the creation of a national innovation system. This is hindered by many macroeconomic factors of a systemic nature, the elimination of which causes certain difficulties. It should be noted that such factors exist in all developing countries, which slows down the transition of these countries to the stages of an active and permanent innovation regime. On the other hand, the duration of innovative stages is longer than traditional production and commercial cycles, since the distribution of a new product (goods, services) from basic research to commercial production and implementation is a continuous process with a complex organizational and managerial structure. In this process, a large number of participants perform a whole range of functions. It is constantly discussed which of the innovative factors that influence the functions performed by these participants are stimulating and which are inhibitory. The author conducted a comparative analysis of existing opinions in this area and came to the conclusion that the factors of innovative development in developing countries are similar, but the degree of their influence is different. It is advisable to group these factors into three areas: external factors, negative macroeconomic factors and current innovation barriers.

The first group of factors includes technological revolutions in developed countries and their dependence of exports on raw materials, and in developing countries, as a result of innovative development, increased international competition for attracting highly qualified personnel.

The second group of factors includes the complexity of the country's economy; low level of research activity; insufficiency of budget funds allocated for scientific, technical and experimental design work, and inefficient spending of these funds; lack of effective links between the scientific and technical sphere and production areas; insufficient attention to innovation-oriented training in educational institutions.

Finally, the third group of factors are: high risk of innovative entrepreneurship; incomplete formation of the national innovation system; non-use of venture capital in enterprises; lack of highly qualified personnel capable of engaging in innovative activities; low demand for

innovation; inefficient use of innovative resources and other factors.

In our country, since 2008, the State Statistics Committee of Azerbaijan has been publishing a statistical report on the factors hindering the introduction of innovations in industrial enterprises. The factors mentioned in these reports are divided into three groups: economic factors, production factors and other reasons. An analysis of the data from these reports shows that 56.6% of all barriers to innovation in the period 2008-2020 are due to economic factors, 25.8% to production factors and 17.6% to other reasons.

The group of other reasons as a factor negatively affecting innovation activity includes the underdevelopment of the technology market, which accounts for 23.4% of all negative cases in this group. The special weights of the remaining obstacles were: underdevelopment of the innovation infrastructure - 19.8%; lack of legislation and normative legal acts regulating and stimulating innovation activity - 19.8%; no need for new products produced thanks to previous innovations - 19.5%; the uncertainty of the duration of the innovation process is 17.5%.

Thus, in order to intensify innovation activity in our country, it is more necessary to eliminate the negative impact of the following factors:

- lack of financial resources for enterprises to spend on innovation;
- insufficient financial support from various sources;
- high value of innovation;
- high economic risk;
- low innovative potential of enterprises.

3. Based on a comprehensive analysis of innovation activity in the civil aviation system of Azerbaijan, the identification of unresolved problems and priority areas for the development of innovation activity.

Although innovative processes with unique characteristics in the civil aviation system of the Republic of Azerbaijan began mainly in the 4th period of economic development (1935-1990s), the rapid development of aerospace technology turned these processes into the main element of change in the 5th period (1990-2025s). Although the main innovative progress in air transport is manifested in the production

of aircraft and helicopters, ground services and their organization and management, provision of aircraft with fuel, the air transportation market, flight safety and other areas where innovation is always required. Recent economic crises, rising aviation fuel prices, liberalization of the air transportation market and increased competition, overloading of the main air hubs, increasing the requirements of regulatory authorities to reduce noise and carbon dioxide emissions into space are forcing airlines to look for new innovative business models. This challenges the aviation industry to create aircraft that are more cost effective, safer, more environmentally friendly and more user friendly.

The main areas of innovative activity of civil aviation enterprises should include the following:

- application of technologies aimed at improving the level of safety and reliability of flights, preventing aviation accidents;
- application of advanced technologies for environmental and ergonomic air transportation systems;
- application of technologies that save energy and resources;
- application of technologies aimed at improving the physical and economic suitability of aircraft, as well as customer satisfaction and loyalty;
- application of technologies that optimize the ground aviation infrastructure using the most modern information and logistics systems.

It is clear that access to financial resources, the availability of government financial support and access to information about new technological innovations are the main factors in all of these areas.

One of the important issues that need to be addressed related to innovation in civil aviation is that the industry as a whole functions as an aviation complex. Thus, several legal entities are involved in the organization of air transportation of passengers and cargo: an airline carrier, an airport that organizes dispatching services for take-off and landing flights, as well as maintenance of the runway and passengers in the landing area and provides cargo logistics, as well as airlines providing aviation services. The development and application of the most optimal model of the relationship between them is one of the areas of innovative development of civil aviation. In other words, the creation of an innovative

infrastructure is one of the important factors in civil aviation.

An analysis of the current situation in the field of innovation activity of the aviation complex of civil aviation shows that the innovative path here is primarily associated with the creation and acquisition, commissioning of new generation aircraft that ensure efficient use of fuel, low noise, high reliability and comfort. The aging of the fleet leads to an increase in fuel consumption and the number of aviation accidents, an increase in the cost of air transportation, and a decrease in the level of flight safety. With this in mind, over the past 20 years, the national air carrier of Azerbaijan, AZAL, with the government financial support, has upgraded more than 90% of its aircraft fleet, formed 9 modern airports, 8 of which have international status, including modernizing 2 international airports in accordance with high requirements, provided use of the most modern security systems, meteorological and ground services. As a result, the volume of cargo turnover by air in 2020 reached 2,302 million tkm, or increased by 22.6 times compared to 2000.

The most important innovations in the civil aviation system are new, modern aircraft purchased for the aircraft fleet, because the volume and quality of passenger and cargo transportation services primarily depend on the modernization and renewal of these vehicles. For this reason, airlines always pay attention to the fact that the aircraft fleet is in working condition and is constantly updated. Currently, the aircraft fleet of AZAL CJSC and the passenger capacity of its aircraft are as follows (Table 1):

Table 1. Aircraft fleet of AZAL CJSC as of 01.10.2022

Aircraft type	Number	Orders	Passengers				Register sign
			B	PE	E	Total	
1	2	3	4	5	6	7	8
Airbus A319-100	4	0	8		114	122	4K-AZ03 “Ganja”, 4K-AZ04 “Guba”, 4K-AZ05 “Gazakh”, 4K-8888 “Baku”
Airbus A320-214	7	0	20		126	146	4K-AZ77 “Lerik”, 4K-AZ78 “Naftalan”, 4K-AZ79 “Oghuz”, 4K-AZ80 “Shirvan”, 4K-AZ83 “Julfa”, 4K-AZ84 “Kurdamir” 4K-AI07 “Baku-7”
Airbus A340-542	2	0	36		201	237	4K-AZ85 “Karabakh”, 4K-AZ86 “Nakhchivan”
Airbus A320 NEO	3					186	VP-BTF, VP-BTN, VP-BTS
Boeing 757-200	1	0	20		150	170	4K-AZ43 “Lankaran”
Boeing 767-300 ER	2	0	22		176	198	4K-AZ81 “Babek”, 4K-AZ82 “Koroglu”
Boeing 787-8	2	4	18	35	157	210	VP-BBS “Shusha” VP-BBR “Ordubad”
Embraer	8		-	-	106	106	
Total	29	0					

As can be seen from the table, the fleet of AZAL CJSC operates American, French and Brazilian Boeing, Airbus and Embraer aircraft purchased at different times. Airbus accounts for 55.2% and Boeing 17.2% of the fleet of AZAL CJSC, which are currently world leaders in the aircraft industry, which is a direct confirmation of the importance that the national carrier of Azerbaijan attaches to innovative solutions in this area.

The fleets of cargo carriers operating in the Republic of Azerbaijan (Silk Way Airlines and Silk Way West Airlines) have recently been

seriously strengthened through the purchase of modern cargo aircraft. These companies operate regular and charter flights to more than 40 countries in Europe, the CIS, the Middle East, Central and Southeast Asia, North and South America. The airline's fleet includes ten Boeing 747-400F and Boeing 747-8F aircraft, three Boeing 747-400 aircraft and two Boeing 767-300 aircraft, as well as seven IL76 TD-90 aircraft, one IL-76 MD and two AN-12 aircraft equipped with the most advanced security systems and innovative systems.

Table 2. Aircraft fleet of Azerbaijan cargo carriers as of 01.10.2022

No	Type of aircraft	number of aircraft in service	the number of orders	Note
1.	Boeing 747-400F	5	-	-
2.	Boeing 747-8F	5	-	-
3.	Boeing 747-400	3	-	-
4.	Boeing 767-300	2	-	-
5.	İL 76 TD-90	2	-	-
6.	İL 76 TD	7	-	-
7.	İL 76 MD	1	-	-
8.	AN-12	2	-	-
9.	Boeing 777 F	-	5	It will be delivered in 2023
10.	Airbus A350	-	2	It will be delivered in 2027-2028.
11.	Total	27	7	-

Silk Way West Airlines, the largest cargo carrier in the Caspian region, operates five out of ten aircraft (Boeing-747-8F Freighter) with innovative qualities. With the acquisition of new Boeing 777 F Silk Way West Airlines will significantly expand its air cargo business. Compared to its peers, the Boeing 777F Freighter will serve air cargo carriers efficiently, delivering the lowest operating costs and highest fuel efficiency in the large cargo aircraft class, as well as environmentally friendly performance.

One of the innovative activities carried out in the civil aviation system of Azerbaijan is the launch of the air traffic control center over the country's territory - "Azeraeronavigatsia". This complex, called AZANS,

is a one-tower building with a height of 66 m at the Heydar Aliyev International Airport. The Center, which serves as a link between Europe and Asia, is the only complex of its kind in the region that houses the Airspace Efficiency, Strategy and Development Center. The center is the main hub for air traffic flow planning between the European Air traffic flow management (ATFM) in Brussels and Air traffic flow management in Singapore. As a result of the effective operation of this complex, Azerbaijan began to play the role of a strategic partner for both Eurocontrol and the Asian air flow planning center.

Countries that make innovation the main focus of their economic policies can develop their economies more successfully. This concept also determines the attitude of the state to innovative development, its basic principles. These principles provide regulation of relations between the subjects of innovation activity, stimulation of innovation activity and innovative development of society as a whole. Regulation of innovation activity by the government is based on the definition of scientific, technical and socio-economic priorities, as well as the choice of strategic directions. One of the main components of the institutional policy of the Republic of Azerbaijan in the modern era is the thorough implementation of reforms in science, which is the basis of innovative development, so that the scientific potential, formed over decades, is not destroyed, lost, and is gradually directed to meet the needs of the republic's economic sectors. In this regard, the adaptation of the scientific school in accordance with the needs of the national economic complex under the leadership of Academician A. M. Pashaev, which was formed in the field of device manufacturing of the former USSR, is currently an example for other scientific schools.

Taking into account that the Republic of Azerbaijan is not a manufacturer of passenger and cargo aircraft, innovative activities in civil aviation should be carried out mainly in the field of improving flight safety and efficiency, modernizing the air transport infrastructure, improving and increasing the range of services provided to other sectors of the economy. To this end, it is proposed to give the National Aviation Academy (NAA) the status of a research university and form a separate aviation innovation cluster on its basis. In addition to the currently

existing research and production areas, it is important to organize R&D in the following areas with government support in this cluster:

- improvement of aircraft takeoff and landing procedures in order to save resources and fuel, increase the efficiency of airspace use, and reduce the negative impact on the environment;
- the use of modern correction systems that increase the accuracy of satellite navigation at all stages of flight;
- the development of a technical and normative-legal base that prevents the unauthorized entry of unmanned aerial vehicles into the airspace;
- creation of a system that regulates and controls the movement of various vehicles and equipment at the airfield;
- development of a blocking system preventing unauthorized access of technical vehicles to the runway;
- modernization of the ground service of aircraft and their control systems;
- Implementation of modern energy-saving, as well as radar systems and means of protection and safety, developed at the National Aviation Academy, at transport infrastructure facilities;
- development of proposals in the direction of increasing the service life of airfield facilities, reducing maintenance and operation costs;
- implementation of measures to ensure the availability and ease of use (accessibility) of air transport and transport services;
- Creation and improvement of a modern training system and infrastructure based on competencies that meet the requirements of Azerbaijan and international civil aviation organizations at the NAA;
- improving the educational infrastructure and internship programs in technical and technological specialties for the aerospace industry, taking into account modern requirements.

Having studied the experience of countries that have taken leading places in the Global Competitiveness Index (Switzerland, the USA, China, Japan, EU countries and the UK), as well as oil exporting countries that have achieved success in innovative development (Norway, UAE) in the field of innovative organization, the author put forward proposals on using the experience of these countries to ensure the innovative development of the Azerbaijani economy.

4. Construction of a conceptual model for planning innovative activities in the civil aviation system and its description.

An objective assessment of the purposefulness and effectiveness of innovation activity depends on the correct determination of the sequence of priorities and individual elements of its development, as well as the tasks of managing innovation goals and a system of indicators that reflect the final results in the course of its development. Although the government pays great attention to the planning of innovative development in our country in the conditions of market relations, this issue has not been studied at the level of enterprises, production and service sectors, and the industrial enterprises of Azerbaijan do not have sufficient experience in this area. In the economic literature, the topic of innovative planning is limited to the development of general planning principles and the identification of priority areas for innovative activity.

The main goal of planning innovative processes in civil aviation is to achieve the main strategic goals of the airline, that is, to increase the volume of traffic and profit, profitability. To do this, the services offered by the airline in the air transportation market must be highly competitive. It is this indicator that embodies all the main priorities of the airline's development, because competitiveness directly depends on the cost and quality of the transport service offered, market conditions and other factors in the formation of demand for transportation, as well as an increase in the number of customers of transport services and the expansion of the market segment.

Based on the foregoing, we can conclude that the planning of innovative activities in airlines mainly serves to implement technical factors and this, due to certain elements of the market, leads to an increase in demand for air transportation, a reduction in the cost of transportation and an increase in the quality of transportation. Given this, when planning innovative activities in the civil aviation system, it is advisable to prioritize factors that increase the competitiveness of the air transportation services offered on the market. The conceptual model for planning innovative activities in the civil aviation system is presented in the form of a scheme (Fig. 1).

As this scheme shows, there is a wide range of areas where

innovation can take place in civil aviation companies. It is necessary to evaluate the effectiveness of innovative development measures (novelty) presented in each of these areas, and choose the most effective of them and include them in the innovation plan. This should take into account the identification of appropriate resources for the implementation of activities included in the innovation plan and the promotion of the implementation of innovative ideas. Each innovative measure must ultimately lead to an increase in the airline's profits.

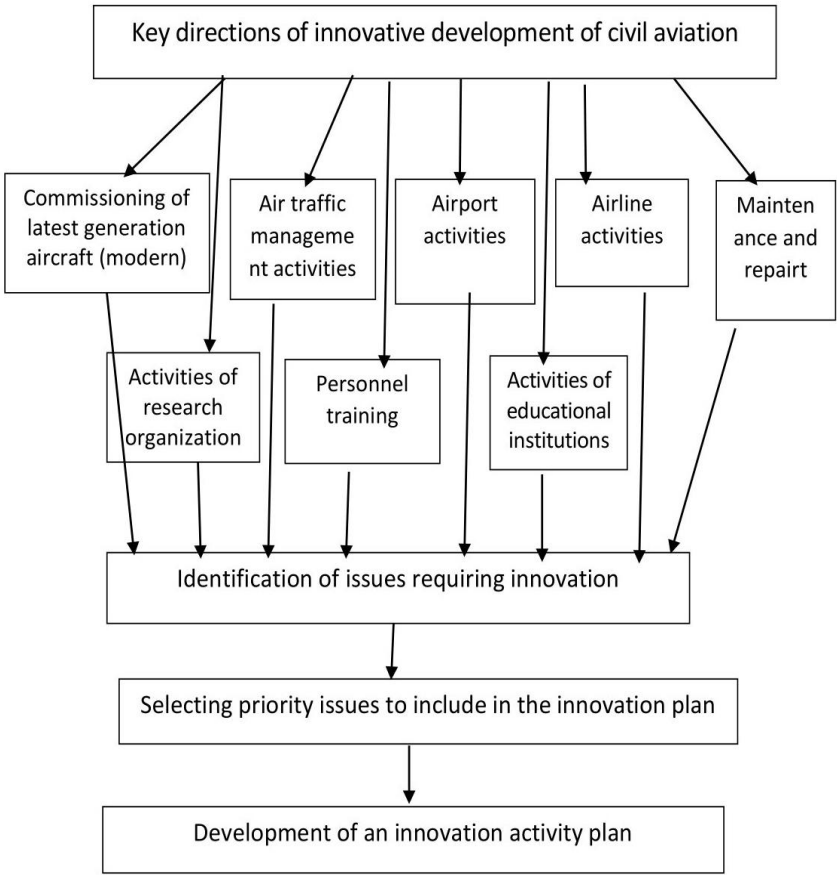


Figure 1. Scheme for planning innovation activities in civil aviation.

Determining the object of innovation corresponding to the chosen strategy and taking into account its main parameters when planning innovation is a complex process that requires the processing of a large amount of information. When choosing an innovative object, airlines pay attention to the composition of the preparatory measures implemented in this area. Purchase and commissioning of a new aircraft, opening of a new air route, connection to a new booking and sales system, etc. - a set of measures with a clearly regulated composition, determined by supplier companies (sellers), bodies providing state regulation of civil aviation, and the airlines themselves.

When choosing an innovative strategy, it is necessary to take into account the results of assessing the competitiveness of the airline, since this indicator itself depends on the quality and cost of the transportation service. The choice of options specified in the innovation strategy will allow airlines and airports to respond flexibly to changes in the air transportation market, pursue a balanced technical and economic policy, and quickly find resources to reduce the cost of transport services. Risks for air transport services must be taken into account when identifying innovative objects associated with the chosen innovation strategy.

One of the priority issues for Azerbaijan is the transition of the national economy to the principles of development based on innovation. The most important measure in this direction is the Decree of the President of the Republic of Azerbaijan dated July 28, 2022 “On some measures to improve management in the field of science and education in the Republic of Azerbaijan”, which provides for the consolidation of the existing scientific potential of ANAS and universities for their more efficient use and thereby accelerating innovative development. According to the decree, the experimental production sectors in 31 scientific institutions of ANAS, which were transferred to the Ministry of Science and Education Republic of Azerbaijan, 5 economic research and service enterprise and High Technologies Park LLC, open up appropriate opportunities for this. Most of these enterprises should be transferred to the universities under the Ministry of Science and Education. Thus, it will be possible to quickly build appropriate technology parks, directly using the experience of the most innovative countries..

5. Substantiation of directions for improving the mechanism for managing innovative activities in the civil aviation system.

It is very important to take into account the risk factor when studying the issues of state regulation of innovation activities in the civil aviation system of the Republic of Azerbaijan. The factors that determine the risk of innovation activities are mainly the continuity of scientific, technical and inventive activities, the emergence from time to time of high-quality products and new innovative technologies. This, in turn, leads to an early decrease in the effectiveness of previously created and adopted innovations, and it is also necessary to take into account monopolistic restrictions in the development and application of new innovations.

When considering the mechanism of state regulation of innovation activities in the field of civil aviation in Azerbaijan, great importance should be attached to the strategic innovation function of the state. The government is directly involved in the innovative development of the economy, that is, it performs one of the most important, responsible and qualified functions - an innovative and strategic function that requires high professionalism, strategic thinking and efforts from state bodies and civil servants.

The expansion of innovation activity and the increase in the production of competitive products are associated with the effective use of the mechanisms of state regulation of innovation activity. In modern times, the government uses a number of economic mechanisms for regulating innovation activity. It is the use of these mechanisms that creates the basis for improving the efficiency of innovative activities implemented both in civil aviation and in business processes. One of the mechanisms of state regulation of innovation activity is the implementation of an effective tax policy. Improving and increasing the efficiency of tax policy depends on reducing the number of types of taxes and tax rates in business processes, as well as in the field of civil aviation, the application of tax incentives, strengthening the incentive function of taxation and other factors.

Thus, the innovation policy of the government is aimed at eliminating the technological decline, widespread introduction of basic innovations as the basis for increasing the competitiveness of local

products in the domestic and foreign markets, as well as increasing innovation activity in the regions. Improving the mechanisms for financing science and innovation in our country, the effective organization of scientific research and the tax policy to support R&D make the innovation sphere the main element of reforms in the public administration system.

World experience shows that one of the effective methods of stimulating investments is the development of public-private business partnerships. It includes partnerships for the entire innovation cycle: the implementation of scientific and technical research in the field of science and innovation, the production and commercialization of a high-tech product using new processes and technologies.

The presence of positive foreign experience in the application of public-private business partnership (PPP) mechanisms in innovative activities, the lack of financial resources for the innovative development of the Azerbaijani economy and other factors necessitate the use of public-private business partnership mechanisms as a source of financing for innovative activities.

A number of measures have been taken to stimulate the development of public-private business partnerships in Azerbaijan. Thus, special economic zones, technoparks, agricultural parks, a technology transfer center and a venture fund were created, state support for improving relations between the state and private business was strengthened. However, the legislative base, organizational, economic and financial mechanisms for the implementation of public-private business partnership projects in the innovation sphere in the Republic of Azerbaijan have not been completed. The main reasons hindering the development of public-private business partnerships in the country include the absence of a separate legislative act on public-private business partnerships and the concept of the phased use of PPP models in the innovation sector, as well as unresolved organizational issues of implementing PPP mechanisms. Due to the lack of progressive mechanisms that positively influence the innovative activity of industrial enterprises, the mechanisms of public-private business partnership in the innovation sphere are not used effectively.

Organizational and financial instruments for the implementation of forms of public-private partnership in the innovative development of the economy are public-private business programs. The method of project financing is most consistent with the goals and characteristics of innovative programs, motivation of government and business. This method ensures that projects are aligned with strategic objectives and that resources are managed effectively. Funding sources for investing in innovative PPP projects can be funds attracted by special economic entities, funds from the state and local budgets, as well as donor assistance from various international organizations.

These factors include areas that accelerate innovative development: Ensuring the long-term management of airports or their terminals or other objects in the field of civil aviation on the basis of a concession agreement, using the form of a life cycle agreement of a public-private economic partnership or leasing when updating the fleet, establishing cooperation on the basis of contracts for the sale of certain types of ground services, the transition of the activities of airlines, handling (provision of ground handling of aircraft) and air navigation services companies to state-owned private business partnerships

Studies show that recently the transfer of airports or their individual sections to the private sector under a concession agreement by the state acts as one of the main forms of innovative development of civil aviation.

Conclusions

In the process of studying the theoretical and methodological foundations of innovation activity in the civil aviation system of Azerbaijan, assessing the current state of innovation activity and researching ways to improve the mechanism of its management, the following scientific and practical results were obtained.

1. It is proposed to consider innovation activity together with scientific, technical and production activities, and it is substantiated that science, innovation and production act as a single system. The transformation of these three types of activity into an integral system is a necessary condition for innovative development.

2. The author considers numerous definitions, explanations and concepts given to the term "innovative activity", and notes that innovative activity is the process of using ideas, methods, inventions to create a new product (goods, services), technologies, production methods and forms of management, their initial testing and practical application that ensures public demand and makes it socio-economically effective.

3. It is proposed to group the factors influencing innovation activity into three areas (external factors, negative macroeconomic factors and current obstacles to innovation activity) and it is noted which of these groups have a greater impact on different countries, taking into account their stage of innovation development. Based on the analysis of statistical data, it was revealed that 56.6% of economic factors, 25.8% of production factors and 17.6% of other factors had a negative impact on the innovative development of industrial enterprises in Azerbaijan in the period 2008-2020. Among these factors, in order to intensify innovation activity, it is very important that enterprises have access to financial resources, increase the potential of their innovation-minded personnel, and expand the opportunities for obtaining innovative information through various channels.

4. Access to financial resources, the availability of government financial support, obtaining information about new technologies, and the level of development of innovative infrastructure are identified as the main factors influencing the innovative activity of civil aviation

companies. To classify innovations, the main criteria were defined goals, directions, subject (objects) of innovations, degree of risk, duration of use and effectiveness, degree of novelty and type of innovative product.

5. When planning innovative development, it is proposed to give priority to factors that increase the competitiveness of air transportation services offered on the market. Based on this, a conceptual model for planning innovative activities in the field of civil aviation has been developed. At the same time, for the correct planning of the innovative development of airlines and airports, it seems appropriate to separately model transportation services and their sales in the structure of innovative processes at these enterprises and draw up innovative projects for each.

6. The experience of successful countries in the field of innovation, including oil and gas exporting countries, was highlighted, and the directions of using this experience in the innovative development of Azerbaijan's economy were determined.

7. Preference for adaptive methods (project and matrix methods) in the process of managing innovative activity at the civil aviation enterprises of Azerbaijan, establishing relationships with subordinate organizations of the AZAL CJSC based on the intrapreneur method, applying the integral method of innovative activity in the organizational structure is proposed.

8. Proposals have been put forward in the direction of strengthening state support for innovation in the civil aviation system, that is, increasing public funds and loans for innovation, creating opportunities for inventors to use bank loans, reducing the state fee for registering patents for inventions, forming industry innovation clusters and creating state holdings consisting of innovative companies.

9. Measures have been developed to stimulate the participation of the private sector in servicing certain sectors of the economy with aviation (agriculture, ecology, etc.), to increase the economic efficiency of innovative activities of public-private partnerships in the implementation of innovative and investment projects in the field of civil aviation. In this regard, it is necessary to separate airports from airlines and transform them into independent legal entities and transfer certain parts of them to the private sector with a long-term concession agreement,

as well as create a model of public-private business partnership for the training of pilots, flight mechanics and aviation engineers through the National Aviation Academy.

10. Given that the Republic of Azerbaijan is not a manufacturer of passenger and cargo aircraft, innovative activities in civil aviation should be carried out mainly in the direction of modernizing the air transport infrastructure and improving the quality and range of services provided to the sectors of the economy. For this, it was proposed to give the National Aviation Academy the status of a research university and create a separate aviation cluster on its basis.

The following publications represent the dissertation's major findings:

1. Əhmədova G.T. Mülki aviasiyada innovasiya fəaliyyətinin idarə olunması.
"Azərbaycan Respublikasında innovasiya yönümlü iqtisadi inkişafın problemləri və onların həlli yolları" mövzusunda respublika elmi konfransı, Sumqayıt - 2010.
2. Əhmədova G.T. Mülki aviasiyada sahibkarlıq və idarəetmə məsələlərinə dair. "İnnovasiyalı inkişafın sosial-iqtisadi problemləri" mövzusunda beynəlxalq elmi-praktiki konfransın materialları. Bakı-2010.
3. Əhmədova G.T. Mülki aviasiyada koronavirus epidemiyası ilə bağlı fors-majör böhran və çıxış yolları. Konfrans materialı. "Fevral məruzələri 2021: Aviakosmik məsələlərin həllində gənclərin yaradıcı potensialı" VI Beynəlxalq elmi-praktiki gənclər konfransı. Bakı-2021. s.215-216.
4. Əhmədova G.T. İnnovasiya sferasında dövlət-xüsusi biznes tərəfdaşlığının inkişaf mərhələləri. "Elmi əsərlər", Naxçıvan Universiteti, Naxçıvan-2022, №2 (26), s. 26-37.
5. Əhmədova G.T. İnnovasiya infrastrukturunun yaradılması şərtləri. "Audit" j-ı. Bakı-2022, № 2 (36), s. 62-68.
6. Abbasov A.B., Əhmədova G.T. İnnovasiya fəaliyyətində dövlət-xüsusi biznes tərəfdaşlığının inkişaf istiqamətləri. "İpək Yolu" j-ı, Bakı-2022, №3, s. 5-14.

7. Əhmədova G.T. İnnovativ inkişafın tənzimlənməsinin metodoloji aspektləri. ENEGO Enerji İqtisadiyyatı Mərkəzinin xəbərləri, 2022, cild 11, s. 25-33.
8. Əhmədova G.T. Elmi-texniki sferada innovasiya fəaliyyətinin təşkilati formaları. “Kooperasiya” j-lı, Bakı-2022, №4, s.19-26.
9. Abbasov A.B., Əhmədova G.T. Mülki aviasiya sahəsində innovasiya fəaliyyətinin dövlət tənzimlənməsi mexanizminin təkmilləşdirilməsi. “Tikintinin iqtisadiyyatı və menecment” j-lı, Bakı-2002, №4, s. 170-176.
10. Ахмедова Г.Т. Актуальные аспекты совершенствования и регулирования инновационной деятельности в сфере гражданской авиации Азербайджана. Ж-л Финансовая экономика, Москва-2023, №3, с.193-197.

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