

**SOME PROBLEMS AND SOLUTIONS FOR THE FORMATION OF A NATIONAL INNOVATION SYSTEM**

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**ANNOTATION**

The article is about the directions of formation and development of the national innovation system of the Republic of Uzbekistan. The article investigates factors, problems and solutions affecting the formation and development of the national innovation system, and also develops a model of the national innovation system.

**Key words:** innovation activity, innovation, innovation economy, innovation model, National Innovation System, innovation activity, effective management, human capital, intellectual property.

**INTRODUCTION**

Ensuring economic stability, recovery of the economy and creation of conditions for its further development is carried out by revitalising innovation activity. That is why the creation of conditions aimed at revitalising the innovation activity of industrial enterprises is one of the most important factors in the implementation of effective structural transformations in the economy. In addition, the assessment of the level of innovation activity of industrial enterprises and the formation on the basis of this innovation activity of a national innovation system, keeping pace with the times, aimed at achieving long-term strategic development goals and ensuring their stable income in the future, are among the topical issues.

**Literature review**

So far, scientists have not given an unambiguous definition of the national innovation system. National innovation systems of developed countries differ from each other. Already in different countries different goals are set and realised before the national innovation system. The author of the textbook with numerous citations Y.P.Surmin writes: 'the division and construction of systems is carried out in the following way: the goal, which the system should provide, is set. Functions or tasks that ensure the fulfilment of functions are defined. The target object is directed in the direction of movement. The goal usually arises from problem situations that cannot be solved by available means. And the system comes to the surface as a means of solving the problems.

So far, neither among foreign nor Russian scientists there is a single universally recognised concept of 'national innovation system. The lack of common views gives rise to different approaches to the methodology of formation of the national innovation system and its components. Based on the conducted analysis of the literature, it is possible to identify eight directions supporting these directions:

- ✚ as a complex of institutions: r. Nelson;
- ✚ institutions and as a set of various elements and components: D.A. Serpukhovitin;
- ✚ as a network of organisations (enterprise, structure) and target types (directions) of their activities: K. Freeman;
- ✚ as interrelated activities, elements and content: B.O.Lumdvall;

None of the concepts proposed by both foreign and Russian scientists to define the concept of national innovation system covers state or national specificities. The conducted analysis of

literature shows that the mechanism of interaction in the national innovation system or state policy, the structure and characteristics of institutions, various elements and components allow to identify the features of national innovation systems of each state.

However, the level of formation and development of the national innovation system, as well as the interrelationships of the structure of the national innovation system are also insufficiently studied and insufficiently researched in our country.

As the purpose of the study we will consider some problems of formation of modern innovation system in the Republic of Uzbekistan.

The aim of the study is the formation of a modern innovation system in the Republic of Uzbekistan, its state, potential, contribution to economic development and competitiveness.

### **Results and Discussion.**

As part of the Sustainable Development Goals (SDGs) established by United Nations General Assembly resolution 70/1, countries have committed to significantly increase public and private spending on research and development by 2030.

According to Robert Merton Solow, American economist, author of the Solow model and 1987 Nobel Prize winner, Robert Merton Solow, between 1908 and 1949, innovative products that were unparalleled led to a 1.5% increase in the growth rate of the US economy. This represented half of the country's GDP during that period. Another American scholar, Edward Denison, identified 23 factors that stimulate economic growth in a given country and 14 of them were related to innovation and 9 factors were related to capital, land and labour. According to the scientist, the invention of a new product and its subsequent entry into the market will increase the GDP of developed countries by about 60%.

Today Uzbekistan is a major scientific centre with a developed research base in Central Asia and an extensive scientific history recognised internationally. However, the pace of innovation development both in Uzbekistan and in Central Asia as a whole has not kept pace with expectations. Uzbekistan was not included in the latest global innovation index, although a few years ago we were ranked 127th out of 144 countries included in the index.

However, as a result of the work done, in the Global Innovation Index ranking, published on 2 September 2020, Uzbekistan after a long break was assessed on 43 entry indicators and 22 exit indicators, rising 29 positions with 80 indicators among 131 countries and ranked 93rd. That is 81 - th place in the access sub-index, with rating columns institutional development (Institutions, 95th place), human capital & R&D (Human Capital & Research, 77th place), infrastructure (Infrastructure, 72nd place), knowledge & technology outputs (Knowledge & Technology outputs, 90th place) positive results in such indicators as: Ease of starting a business (Ease of starting a business) ranked 8th, Graduates in science&engineering (Graduates in science&engineering) ranked 7th and Gross Capital formation (Gross Capital formation) ranked 8th. At the same time, it ranked 12-45th in 8 important indicators.

It also remains at the bottom of the list in the following indicators: Regulatory quality - 127th place, Rule of law -124th place, ICT services exports - 129th place, gross expenditure on research and development financed by abroad -96th place.

Our country ranks 12th among 29 middle-income countries of the group and 4th among 10 countries of Central and South Asia, with India in 1st place with rating indicators 48, Iran in 2nd place 67 and Kazakhstan in 3rd place with rating indicators 77.

According to the UNESCO Institute for Statistics, in 2015, the world's R&D funds

averaged 1.7% of GDP, while for Central Asia this figure was 0.2%.

According to the World Bank, R&D expenditures in Uzbekistan and Kazakhstan are at about the same level-0.13 per cent of GDP, which is very low. In comparison, Egypt spends about 0.72%, Brazil and the Russian Federation - 1.26% and 1.0%, the USA and Germany - 2.84% and 3.09%, Sweden and Japan - about 3.34% and 3.26% of GDP respectively. South Korea is a leader in this respect, with R&D expenditure accounting for 4.81% of the country's GDP, as evidenced by the presence of world-class corporations such as Samsung, LG, SK Holdings, POSCO, Hyundai and others.

In countries with high R&D investment, the private sector accounts for the majority of R&D investment. In Japan, about 80% of investment is spent by the private sector. In China and South Korea, the private sector spends more than  $\frac{3}{4}$  of total R&D investment. In Uzbekistan, by contrast, the state finances more than 60 per cent of total R&D expenditure. This indicates that the private sector in Uzbekistan does not yet have sufficient incentives to move in this direction and sufficient capacity to develop innovative solutions on its own.

In the countries of the Organisation for Economic Co-operation and Development, 80-90% of GDP growth comes from innovation.

Our research shows that the transition of these countries to the path of national innovation development occurred as a result of the creation of a national innovation system. Starting with the import of innovative technologies by developing countries, they formed their own innovation system. The model of innovation they used shows that the rational use of imported scientific and technological achievements not only provided significant GDP growth, but also proved that they can help to raise their economies to a qualitatively higher level of the economically developed countries of the world.

So, based on the above, based on our conclusion, we can define the term 'national innovation system' as a set of organisational, legislative, structural and functional components that ensure the functional functioning of the national innovation system of a given country, providing innovative development.

These structures are components that provide access to various resources and provide some support to participants in innovation activities. This system includes a set of enterprises (organisations), mutual movement of knowledge and technologies in all spheres of economy and society.

In our opinion, the innovation system is a system that combines at a certain point the principles of science, technology, economics, entrepreneurship and management, as a result of which the process of transformation of scientific ideas and projects into an innovative product is accelerated. Therefore, in the world practice, the development of innovation system for developed and developing countries is one of the most important priority strategies.

Taking into account the above, the purpose of the model of the national innovation system of the Republic of Uzbekistan proposed by US, sources of financing, economic and organizational institutions, information supply of innovative activities, personnel supply, legislative framework, monitoring and coordination system for the implementation of State Scientific and technical programs and projects, research organizations, interaction of innovative infrastructure entities and knowledge users, it consists in creating a favorable institutional climate and an innovative system for state structures at the level of commercialization of state organizations, subjects of innovative activities and innovative developments, as well as promoting the development of a complex of

strategic directions for innovative activities, fundamental knowledge.

The development of the mechanism of interaction of the model of the national innovation system is a large-scale complex task, which will be possible only through carefully thought out, mutually agreed effective actions of the president of Respubliki of Uzbekistan, the Cabinet of Ministers of the Republic of Uzbekistan, state organizations, subjects of innovative activities and the commercialization of innovative developments. The priority policy of the state, aimed at the development of the national innovation system, is among the areas considered important to Uzbekistan today. It is recommended to use the proposed model of the national innovation system in the development of innovative development strategies under the law on innovative activities of the Republic of Uzbekistan for medium - term and long-term periods, effective solution of important innovation problems in promising areas, development of regional innovation and investment programs.

According to the proposed model of the national innovation system, innovation policy in Uzbekistan is determined by the President and the Cabinet of Ministers and implemented by the republican and local state bodies within the limits of their authority.

The legislative basis for the formation and creation of mechanisms for the sustainable development of the national innovation system includes the laws adopted in Uzbekistan and a number of decrees and resolutions.

In particular, the decrees of the president of the Republic of Uzbekistan dated July 8, 1992 "on the development of state support and innovation activities in Science", published on February 20, 2002 "on improving the organization of research activities", dated August 7, 2006 "measures to improve the coordination and management of the development of Science and technology- on 24 May 2011, the resolution of the Cabinet of Ministers of the Republic of Uzbekistan "on additional measures to promote the implementation of innovative projects and technologies in production", July 15, 2008 "on the establishment of intellectual property agency of the Republic of Uzbekistan" and the measures of the Cabinet of Ministers of the Republic of Uzbekistan "on the development of, On January 19, 1998, on "development of international scientific and technical relations, state support of scientific programs and projects on grants of international and foreign organizations and foundations", on September 7, 2004, "on measures to strengthen the scientific and material and technical base of the Academy of Sciences of the Republic of Uzbekistan ", on October 15, 2008, "technology transfer agency" on improving the activities of the State Unitary Enterprise", on November 10, 2008, on measures to strengthen the material and technical base of scientific research institutions and organizations", the first directive documents on the development of the national field of Science and innovation were based on a set of measures to modernize the sectors of the economy of our country, to expand the scope of innovative products and services in the future, based on technical requirements.

Today, the basis of the system of state regulation of innovation activities, support and development of scientific technical activities, improvement of the competitiveness of the country's scientific potential is the PF of the president of the Republic of Uzbekistan dated September 21, 2018 on approval of the strategy for the innovative development of the Republic of Uzbekistan in 2019-2021- 5544, PF-6097 "on approval of the concept for the development of Science until 2030" of October 29, 2020, PF-6198 "on improvement of the public administration system for the development of scientific and innovative activities" of April 1, 2021, at the same time, the president of the Republic of Uzbekistan on measures to further strengthen the infrastructure of

research institutions and develop innovative activities “, On November 29, 2017, PQ-3416, on April 27, 2018, PQ - 3682 "on measures to further improve the system of practical introduction of innovative ideas, technologies and projects" and on July 24, 2020, based on the law of the Republic of Uzbekistan "on innovative activities" PQ-630.

The above laws, decrees and resolutions further improve the activities of research institutes, material and technical and laboratory - strengthening the experimental base, creating conditions for the development of innovation activities, revitalizing and developing the activities of the Academy of Sciences, restoring the activities of 9 scientific research institutes, reorganizing a number of scientific institutions, establishing 3 branches of the Academy of Sciences in scientific fields, including the Navoi Branch, Public Council on the new history of Uzbekistan, agency for science and technology, in order to increase the competitiveness of the country's scientific potential by organizing the activities of the foundation for the support and development of scientific technical activities, to strengthen the material and technical, laboratory and experimental bases of scientific infrastructures in the near future, it serves to further strengthen the basis of the comprehensive systematic changes in the development of scientific and after the adoption of the decree of the president of the Republic of Uzbekistan PQ3416 "on the establishment of the Ministry of innovative development of the Republic of Uzbekistan" on November 29, 2017, the attention to innovative activities in our country increased. Now all processes in science and innovation are carried out and coordinated by this ministry. The ministry has become a state governing body implementing a unified state policy aimed at the comprehensive development of society and state life in the field of innovative and scientific and technical development of the Republic of Uzbekistan, increasing the intellectual and technological potential of the country.

However, the R&D and innovation management mechanism implemented by the Ministry still does not meet the objectives of innovative development:

- ✚ Lack of consistency in creating motivation and mechanisms for innovation in Uzbekistan;
- ✚ Coordination of innovation development in the country is weak;
- ✚ Coordination of R&D activities with economic and social spheres is currently limited to assessing the alignment of R&D activities with priorities formulated in a very broad range;
- ✚ priorities are formulated in such a way that they can include any research in the field, regardless of its practical application, and do not contribute to the development of specific strategies and programmes.

The created regulatory environment also has the following disadvantages:

- ✚ existence of legal loopholes in attracting rights to the results of intellectual activity created at the expense of budgetary funds or state organisations into economic turnover;
- ✚ insufficient norms of inability of institutions to secure and dispose of exclusive rights to the results of intellectual activity created by them, including those created at the expense of budgetary funds, as well as to the income received from the use of these results;
- ✚ absence of regulatory and legal framework aimed at the development of economic cooperation between individual elements of innovation infrastructure (innovation funds, technology implementation centres, engineering laboratories, technoparks, etc.) ;
- ✚ the absence of a legal and regulatory framework to ensure a strong integration of education, science and production, and the actual lack of functioning of the existing ones;

- ✚ Lack of a formal procedure for the use of intellectual property rights.

### **CONCLUSION**

Thus, innovative development should be a systematic and targeted effort by the state, private business and civil society institutions to ensure the rapid development of Uzbekistan in the field of science, innovation and the digital economy.

At the same time, the relevant experience of leading innovative countries and successful methods of organising an effective innovation economy, including commercialisation of scientific developments, are important for Uzbekistan.

We propose the following priority directions for accelerated innovative development of the country, attraction of investments, economic growth and development of other spheres of state and public life:

- ✚ Improvement of the management system in science;
- ✚ improvement of the system of financing of science and scientific activity and diversification of sources of financing;
- ✚ Training of highly qualified scientific and engineering personnel and directing them to scientific activity;
- ✚ Formation of a modern information environment conducive to the development of science;
- ✚ Improvement of work on introduction of knowledge and new technologies in the domestic and world markets;
- ✚ Organisation of scientific activity of scientific organisations taking into account the prospects of socio-economic development of the country;
- ✚ formation of a competitive market and efficient use of resources ensuring the transition of the economy to the innovative way of development;
- ✚ it is necessary to develop competition in all areas and reduce administrative barriers.

At the same time, it is necessary to solve a systemic problem based on the principle of concentration of budgetary resources on financing of scientific-research works on medium-term and long-term priorities - the main directions, and the use of the mechanism of public-private partnership.

As a result of implementation of the author's concept of functioning of the innovation system in the Republic of Uzbekistan will be created an effective national innovation system, including mechanisms of interaction between the state, business, science and education, which will increase the share of science-based products in GDP.

Consequently, through the development of the national innovation system in our country there will be opportunities for the formation and development of innovation potential, as well as further increase the competitiveness of the economy. It also has a positive impact on the development of the national economy at present. To summarise, we can say that the formation, development and effective management of the national innovation system leads to the formation of a new economy based on innovative knowledge in our country. This will certainly become the basis for increasing the competitiveness of the national economy.

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