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THE ROLE OF INNOVATION IN THE DEVELOPMENT OF SOCIETY: THEORETICAL APPROACHES AND EXPERIENCE OF RUSSIA

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Abstract

In modern conditions, the basis for the dynamic development of any economic system is innovative activity, which ensures a high level of its competitiveness. The degree of development of the national innovation sphere forms the basis of sustainable economic growth and is a necessary condition for the country's full participation in the world division of labor.

The article discusses the main directions in innovation research. The authors analyze the role of innovation in the development of Russia.

Keywords: innovation, innovation process, typology of innovations,"Russian Technologies", RUSNANO.

I. INTRODUCTION

The term "innovation" comes from the Latin "novatio", which means "update" (or "change") and the prefix "in", which translates from Latin as "in the direction", if translated literally "Innovatio" - "in the direction of change" ... Scientific and technical innovations, recognized all over the world as the most important factor of economic development, are increasingly associated in both Western and domestic literature with the concept of the innovation process. This, as the American economist James Bright has justly noted, “is a one-of-a-kind process that combines science, technology, economy, production and management. It consists in getting innovation and extends from the inception of an idea to its commercial implementation, thus covering the entire complex of relations: production, exchange, consumption ” [1, P. 193].

In the broadest sense of the word, innovative activity is a moment in the life of societies, which includes socio-political, economic, social and other factors of social development.

In the narrow (“specifically economic) sense of the word, innovative activity is aimed at providing a new level of interaction between factors of production, through the use of new scientific and technical knowledge. The content of innovation in the economic sphere is the creation and dissemination of innovations in material production. It is a link between the scientific and production spheres, as a result of the interconnection of which, the technical and economic needs of society are realized.

The innovation sphere differs from the scientific and industrial one by the presence of a specific marketing function, specific methods of financing, lending and methods of legal regulation, as well as, most importantly, a special system of motivating innovation. Ultimately, these methods are predetermined by the specifics of innovative labor and the circulation of funds, the receipt of economic income and an innovative product.

II. DISCUSSION

The very concept of innovation first appeared in scientific research in the 19th century. The first major theorists of innovation processes are rightfully considered N.D. Kondratyev and J. Schumpeter. World-renowned scientist Nikolai Dmitrievich Kondratyev is one of the outstanding Russian economists of the 20th century. The greatest fame and fame brought N.D. Kondratyev, his concept of large cycles of the conjuncture, now all over the world called "Kondratieff cycles." The theory developed by him, which has become known in the West as the theory of "long waves" in economic dynamics, based on the generalization of a giant massif information has had and continues to have a significant impact on modern science. The idea of the existence of large cycles was expressed by Kondratyev in 1922 in the book "The World Economy and Its Conjuncture in time and after the war ”, is described in the article“ Great cycles of the conjuncture ”(1925) and at the discussion on this problem, which took place in February 1926 at the Institute of Economics. To substantiate large cycles (48-55 years), N.D. Kondratyev analyzed statistical data on the four leading capitalist countries - England, France, Germany, and the United States. Kondratyev made an important observation about the nature of these cycles: before and at the beginning of an upward wave of each long economic cycle, profound changes are observed in the conditions of the economic life of society. According to N.D. Kondratyev, "... before the start of the upward wave of each large cycle, significant large technological inventions and discoveries, profound changes in the production and exchange techniques are observed" [2, P. 47]. There is a massive renewal of generations of new technology, the involvement of new countries in world economic ties, a change in gold production and money circulation. Kondratyev assigned the main role to scientific and technical innovations. In the development of the first upward wave (late 18th century), inventions and advances in the textile industry and the production of cast iron played a decisive role. Growth during the secondwaves (mid-19th century) was primarily due to the construction of railways, the development of maritime transport. The third upward wave (late 19th-early 20th centuries) was associated with inventions in the field of electronics and the massive introduction of electricity, radio and other innovations.

Innovations shift the economic environment from a downward to an upward trend, causing a wave formation. N. D. Kondratyev showed that innovations are distributed unevenly over time, appearing in groups or clusters. Thus, in the studies of N.D. Kondratyev, for the first time, the foundations of the cluster approach are seen. According to J. Schumpeter, “... Kondratyev's works produced a great effect and represent ... the peak achievement of a wave of research conducted by a significant number of competent economists (Pervushin, Oparin, Sokolnikov, etc.) [3, P. 1522]. Schumpeter saw innovations as opportunities for accelerated overcoming of economic downturns through the activation of radical technological changes. The norm for a healthy economy lies in the dynamic imbalance caused by the activities of the innovator-entrepreneur. The goal of innovation is to increase the return on investment. Innovation is more an economic and social concept than a technical one. J. Schumpeter identified 5 typical changes: 1. making a new one, i.e. a good that is still unknown to consumers or the creation of a new quality of a particular good; 2. the introduction of a new one, i.e. a given branch of industry

of a still practically unknown method (mode) of production, which is not necessarily based on a new scientific discovery and which may also consist in a new way of commercial use of the corresponding product; 3. development of a new sales market, i.e. a market in which, until now, this industry of this country has not yet been represented, regardless of whether this market existed before or not; 4. obtaining a new source of raw materials or semi-finished products, equally regardless of whether this source existed before, or simply was not taken into account, or was considered inaccessible, or it still had to be created; 5. carrying out the appropriate reorganization, for example, securing a monopoly position (by creating a trust) or undermining the monopoly position of another enterprise [4, P. 133]. Various types of innovations can be differentiated depending on the scale of the process itself, the measure and cardinality of the transformations, the degree of innovative impact on all spheres of the socio-economic life of society. J. Schumpeter divided the innovations intobasic, which are the basis for the emergence of new industries and new markets, and secondary (improving), not affecting the main technological scheme, but improving the quality of the product or slightly changing certain elements of the technological process in order to save certain types of resources. G. Mensch singled out pseudo-innovations or imaginary innovations that introduce changes under the influence of short-term fluctuations in consumer preferences. J. Grossman (1970) singled out instrumental and fundamental innovations. Fundamental innovation is value-in-itself, while instrumental innovation is conceived with the aim of creating conditions for easier implementation of fundamental innovation.

In science, the following typology of innovations has become generally accepted: 1) radical (basic), i.e. fundamentally new technologies, types of products, management methods, which mark cardinal advances not only in various spheres of management, but also in the whole life of society; they embody fundamentally new scientific ideas and revolutionizeproductive forces; 2) evolutionary, based on the change of generations of technology, the emergence of a new technology while maintaining the original fundamental scientific principle; 3) modifying, associated with the improvement, addition of individual parameters of the product, technology, principles and forms of economic activity, contribute to their renewal within the framework of the basic structures and principles.

When defining innovation, consumer behavior patterns are taken into account. This approach is at the heart of the typology according to which there are: 1) a sluggish innovation (has minimal impact on patterns of behavior); 2) dynamically developing innovation (new and traditional forms of behavior are contained in the personal structure of individuals in equal measure); 3) fleeting innovation (quickly approves new patterns of behavior).

A.A. Meshkov identified two main approaches in the study of innovation: 1) organization-oriented and 2) individually-oriented [5, P. 118]. In the organization-oriented approach, the term “innovation” is used as a synonym for the concept of “invention” and refers to a creative process where two or more representations, ideas, objects are combined by a social subject involved in the process in a special way in order to form a previously non-existent configuration (J. Hage, M. Aiken, H. Shepard, E. M. Rogers [6], J. Zultman, R. Duncan, J. Holbeck, S. Becker, T.L. Weisler, J.K. Wilson, G. Watson, and others). This subject is called the agent of innovation. Innovation is a complex of interrelated processes and is the result of conceptualizing a new idea aimed at solving a problem and further to the practical application of the new phenomenon. The novelty of the supporters of the organization-oriented approach is measured not in relation to society, but in relation to the studied organization. Social change is associated with the innovation process only at an early stage of its diffusion, and innovation can be both a cause and a consequence of social changes, and the resulting change brings new ideas into the system (not only those that are needed).

The diffusion process is a phenomenon that is believed to be P. Blau (1964), arises from the agreement of potential recipients of innovation with the proposed changes and is partly the result of the interaction of these units. Diffusion can be defined as the process of spreading innovation through communication channels to members of the social system. Change occurs when the diffusion process turns innovation into an integrated part of the system's normative patterns. The perception of the potential for innovation is associated with the feeling of members of the organization that: a) the organization has all the opportunities to introduce innovation; b) the organization has experience of successful implementation of innovations in the past; c) a certain part of the organization's members is ready to take responsibility for the results of innovative activities. It studies the phenomenon of innovative dissonance, which is understood as the clash of the individual's attitudes with the

need to follow the norms of behavior dictated by the structures of formal power in the organization.

Other variants of this approach consider innovation as an idea, practical experience, artifact that has been discovered or is considered new, regardless of the quality of its perception by individuals. In this understanding of innovation, the emphasis is shifted to ongoing processes - including the invention and implementation of innovations. The opinion of the supporters of the organization-oriented approach in the study of innovations is associated with the idea that a significant circle of innovations has, first of all, the form of an idea and by its nature should remain only a mental structure, while other types of innovations can receive a tangible “material” embodiment - in the form of a certain material structure, defined intellectual or aesthetic concept, or a certain form of relationship between individuals. An individually-oriented approach (R. Zultman [7], N. Lin, T. Robertson, W. Bell, R. Crane, J.L. Walker, K. Knight, N. Gross, etc.) describes a process in in which a certain new socio-cultural object (innovation) becomes part of the set of individual behavior patterns and one of the components of their cognitive sphere. Innovation is considered as inventive activity when two previously unrelated systems - the individual and innovation - intersect in a special way. A typical model of the innovation process consists of three stages (the decision-making process is key here): 1. Development of an innovation (creation of a concept and documentary description of the innovation); 2. Decision making: 1) development of alternatives; 2) forecasting the consequences of each alternative; 3) clarification of the criteria for selecting an alternative; 4) selection of the alternative that best meets the minimum performance standards among other alternatives; 3. Implementation of the solution (overcoming resistance and routinization of innovation). Typologies of innovative solutions are often based on the level of involvement of members of the organization in various stages of initiation of the decision-making process. In the decision phase, information about potential for innovation. The quality of information transmission channels is of decisive importance. Allocate: 1) administrative decisions (members of the organization do not affect the decision-making process) and 2) collective (participatory) decisions (members of the organization determine the decision-making process). It is believed that solutions of the first type are more effective because they reduce the scale of resistance to change, and the flow of new proposals for improving the quality of innovation increases.

Participatory decision-making ensures that innovation is realized if members of the organization feel they will be rewarded for their efforts. The state of the decision-making agent March and Simon are classified as follows: 1) confidence (the function of having complete information about the likely distribution of the consequences of choosing one or another alternative); 2) risk (the function of possessing information about the likely distribution of the consequences of choosing one or another alternative); 3) uncertainty (a function of the impossibility of determining the probability of the occurrence of one or another consequence of a decision or the difficulty in establishing an approximate probability). The researchers point out that innovation is the process of turning uncertainty into risk. Risk and uncertainty are a function of an individual's perception of innovation in the context of the current social situation. There are two types of risks: a) political (the function of action of factors of the institutional level of the macrosystem and the state of the relevant social system predicted by the subject in the long term); b) situational (associated with the action of random factors, most of which cannot be controlled). The action of the actors of the dynamic environment, constituting the phenomena of risk and uncertainty, can appreciably influence the process of diffusion of innovation and its final results. The highest risk is characterized by innovations associated with new areas of knowledge. Uncertainty can be ontological ("what is the novelty of this object?"), Technical ("can this be done?") And marketing ("can this innovation be sold?"). The main feature of the individually oriented approach is that its supporters describe innovation through the prism of the processes of individual perception. The perception of novelty as such is exclusively subjective and does not depend on whether the object in question existed as new before or not: the individual perceives it as new. A social subject becomes a supporter of innovation when he can predict his state in the context of the innovation process in terms of gaining or losing social benefits. An individual can develop innovative perception in the process of acquiring new knowledge and revising his values, attitudes, and expectations. In terms of social structure, transformation of innovation opportunity in social action is associated with the phenomena of social mobility - with the implementation of the actual or potential ability of the agent of innovation to occupy a new niche in the social hierarchy due to the emergence of a special, stimulating activity, situation. The consequence of innovation can be both the emergence of a number of new and the erosion of a number of previously existing status positions of the social structure.

III. RESULTS

Since the beginning of the 2000s, the state has taken a number of actions to boost innovative development. On March 30, 2002, the President of the Russian Federation V. Putin approved the "Fundamentals of the policy of the Russian Federation in the field of development of science and technology for the period up to 2010 and beyond", in which the formation of a national innovation system is provided as the most important task. Over the five years - 1998-2003 - we managed to double the growth of expenditures on innovation (in comparable prices), and later on, these expenditures only increased. In 2005, 15.3 percent of all investment expenditures of the budget were directed to high-tech science-intensive projects. In 2006, this share increased to 23.4 percent. If in 2003 1.3 percent of GDP was spent on innovation, then by 2010 this figure will increase to 1.8 percent of GDP. Finally, in accordance with the program, the number of elements of the infrastructure of the national innovation system created annually will increase from 38 units in 2004 to 200 units in 2010.

The tasks of the innovative development of Russia were outlined in 2005, when the government approved the "Main directions of the RF policy in the development of the innovation system for the period up to 2010". They were not implemented largely due to the crisis. In 2011, amendments were made to the law on science, which determined the procedure for state support for innovation. From January 1, 2012, companies have been granted the right to set aside 3% of income tax for R&D purposes.

Private venture funds emerged. Back in 1997, the Russian Venture Investment Association was founded, and in 2006 - the National Association for Innovation and Information Technology Development (NAIRIT). By the decision of the government, a Russian venture company, a state "fund of funds", was created at that time. However, there are no tangible results on the innovation front so far. Experts note poor interdepartmental coordination of research, the absence of a mechanism for the transfer of defense and civilian developments, and a low level of competition in the scientific environment [8]. Less than 10% of companies are involved in the process of creating innovations, while the average value for the Organization for Economic Cooperation and Development (OECD) is 50%, and for Germany - all 70%. In 1990, the country spent 2% of gross GDP on R&D, in 2013 - only 1% with a noticeably reduced number of scientists and engineers [9, P. 32].

But there are also some encouraging signs. A serious program of innovative development is carried out by the state corporation "Russian Technologies", which invested 340 billion rubles in its financing in 2011-2013. [10, P. 706.] As the general director of the corporation S. Chemezov emphasized, the list of its breakthrough projects covers "a wide range of industries, from aviation to biotechnology and medicine," and some technologies "have no analogues in the world until now" [11, P. 46].

Medical equipment that allows doctors to carry out complex operations, as well as medicines, is now one of the main activities of the state corporation Rostec. Its head Sergei Chemezov on July 28, 2020 presented to the President of the Russian Federation V.V. Putin report on the work. To create “smart products” and technologies that will improve the quality of life of people - this is how the company sees its mission. Rostec unites nearly 800 enterprises throughout the country. The profile is very different - from vaccines to precision weapons. “We have developed an impervious material for bacteria, viruses, germs. This material, it is also resistant to aggressive substances. It is convenient to handle, therefore this product is made reusable,” - says Vera Matveeva, Deputy General Director for Research and Innovative Development of KazChemNII JSC. These suits have been produced since April, and many doctors have escaped the risk of contracting the coronavirus thanks to them. Sergei Chemezov's report to the president said a lot about the civilian products of the state corporation Rostec. According to S. Chemezov, Roskhimzashchita has produced more than 3.5 million sets of clothing for infectious disease doctors since April 20, 2020. In the domestic market, the products of the state corporation "Rostec" account for 10%. As for ventilators, at the beginning of the year, only 60 devices were produced per month. Today, three thousand devices are produced, productivity has increased 50 times. The development of vaccines is a matter of national security in modern realities. And in this it is necessary to work proactively, to increase their capabilities. Since 2015, the share of imported vaccines on the Russian

market has decreased from 69% to 17%. For example, the first Russian quadrivalent vaccine for the prevention of influenza "Ultrix" has been created.

S. Chemezov notes that in any new developments, the key issue is that from invention to manufacture and application as little time as possible passes. An example is the Zenit automated laser surgical complex capable of performing unique operations inside the body cavity and the Diater ultrasound complex for the diagnosis and therapy of neoplasms. These devices began to appear in Russian hospitals. Rostec is implementing a program to create a National Air Ambulance Service; the first eight Ansat helicopters are already in operation. In the next 2 years, it is planned to deliver 66 helicopters. Ansat and Mi-8 are fully equipped with Russian medical equipment and provide everything necessary for both doctors and patients.

In Crimea, the state corporation helped launch two thermal power plants - Balaklavskaya and Tavricheskaya, and in the Moscow region the first line of Russia's largest waste processing complex was launched. This made it possible to close the notorious Volovichi landfill near Kolomna. Domestic waste brought here, which is 650 thousand tons, is partly reused, partly from them they make technical soil, suitable, for example, for growing lawns. The Power of Siberia gas pipeline received 18 gas turbine engines from Rostec enterprises, and KamAZ is developing “land-based drones”.

The test of the KamAZ unmanned vehicle became a landmark event for the Automotive Industry and the Russian industry in general. Civilian products make Rostec corporation financially stable, and it already accounts for more than 30% of the production. This allows us to flexibly respond to the global market situation, almost 600 thousand employees at Rostec are provided with jobs for a long time. The products of Russian defense enterprises are actively exported. The main demand is for the products of the Air Force and air defense. The order book remains at the level of 2018 at $ 51.1 billion - a large package, and this volume remains the third year. The obligation was fulfilled ahead of schedule and the delivery of the S-400 Triumph air defense system to Turkey was carried out, this is the first contract of this scale to a NATO country, the contract amount was $ 2.5 billion. The corporation has fulfilled all the contracts under the State Defense Order - despite the fact that there are almost three thousand more of them compared to the previous year. The total profit of Rostec enterprises is growing, this indicator, as well as the level of development of innovative technologies and the implementation of social projects, speak of the corporation's performance [12].

RUSNANO Joint Stock Company, established in 2011, invests in innovative areas of medicine, electronics, renewable energy, which are important not only for the country, but also for every person. Money is invested in companies that produce high-demand products, pay taxes, create jobs, develop and multiply the funds invested in them.

The modern metropolis lives in a non-stop mode. And all this is thanks to electrical energy. It is enough for her to dry up for a moment and life in the city will stop. To prevent this from happening all over the world today strive to make electric grids "smart" by introducing digital technologies. 10 years ago RUSNANO supported a group of Russian scientists from the Fryazino Institute of Radio Engineering and Electronics, who developed an advanced technology for measuring electric current and voltage using optical fiber. Today, the Profotech company created by them is one of the few manufacturers of digital instrument transformers in the world that help make the operation of the power system reliable and safe.

"Carbon-free energy", that is, the production of electricity without burning coal, oil and gas, is the future that humanity must come to if it wants to wisely spend its resources and keep the planet clean. For the sake of this future, the Wind Energy Development Fund is conducting a large-scale program for the construction of wind farms in our country. And RUSNANO, together with Russian and foreign partners, creates factories that produce various components for wind turbines. Solar panels are devices that convert solar energy into electrical current. The Hevel group of companies produces solar panels with one of the highest efficiency in the world - 23%. The solar power plants built by the company saved 83 million cubic meters of natural gas and avoided the emission of 147,000 tons of CO2 into the atmosphere. These figures are noticeable even on the scale of the entire Earth.

PET - Positron Emission Tomography - is a method of examining internal organs. The results of PET are used to diagnose and treat nuclear medicine, a modern clinical area in oncology, cardiology, and neurology.

PET Technology has established a national nuclear medicine network in Russia. Now, in ten regions with a population of 28 million people, these advanced and effective methods are available to everyone, and more than 100,000 have already used them, including 1,350 people who have successfully operated the beam cyberknife. With the help of vaccination, mankind has already got rid of many terrible diseases, but this work cannot be stopped for a single day. Today, one of the most harmful infections is poliomyelitis or infantile spinal palsy. Every child born is at risk of facing it.

The global demand for a polio vaccine is enormous, and the drug being produced is sorely lacking. In Russia, NANOLEK has organized a full-cycle production and produces 4 million doses per year, fully providing universal vaccination in Russia. To restore and replace hard tissues in the human body, there is a modern material - biocompatible nanoceramics. Long-lasting artificial joints and nanoceramic teeth, instead of those lost due to illness or injury, return people to a full life. NEVZ-CERAMIX is the first domestic manufacturer of nanoceramic medical implants, artificial joints, and prostheses. 4500 only hip joint endoprostheses from NEVZ-CERAMIX have already been delivered to Russian clinics. According to the state program for eliminating the "digital divide", all settlements with 250 to 500 people should be connected to high-speed Internet. Wire made of metal cannot provide fast transfer of the required amount of data; here you need optical fiber. Fiber Optic Systems produces 4 million km of optical fiber per year. This is enough to cover the needs of the state program by 80%.

In modern technology, lithium-ion batteries are used as storage devices and sources of electrical energy. LIOTECH is the only Russian manufacturer of such batteries for urban electric transport, which frees our cities from harmful emissions of combustion products.

The general needs of Russia for electric passenger transport are enormous - up to 7,000 cars a year - and the work has already begun successfully. In 15 cities, more than 200 Liotech electric buses and trolleybuses with batteries are transported, allowing passengers to continue driving outside the wired network.

With the development of technology, the sizes of the components that make up it are constantly decreasing, but it is even more important when microelectronics takes over the functions of order and control that concern each person. Here, her work should not only be accurate, but flawless. Such "responsible" integrated circuits are produced by the Russian company "Mikron". 1,800,000 football fans of the 2018 World Cup quickly and orderly entered the stadiums using special fan passports with Micron RFID tags. Protected chips in the Mir cards provide uninterrupted payments, and Russian citizens traveling abroad have reliable chips in their biometric passports [13].

The program of creation of technoparks in the field of high technologies, which has existed since 2007, is beginning to pay off. “Currently, thanks to the work of 620 resident companies, implementing 805 projects in the field of high technologies, 15 thousand jobs have been created,” said in May 2013, Deputy Minister of Communications Mark Shmulevich. “At the same time, the volume of products and services rendered in 2012 exceeded 25 billion rubles, while in 2011 it amounted to 19 billion rubles, and in 2010 - 15 billion rubles”. In 2012, venture capitalists invested $ 910.6 million in Russian projects - 2.3 times more than a year earlier. More than 70% of investments fell on IT Internet projects [14].

Information technology is still one of the most dynamic industries. Broadband Internet access has been provided throughout the country, and the transition to digital television and fourth generation mobile communications has been made. In 2011, capital investments in the communications industry increased by 35.2, and its profit increased by 5.1%. According to the Ministry of Telecom and Mass Communications, in 2013 the market of information services crossed the mark of 28 billion dollars [15]. The world ranking of the fifty most powerful supercomputers now includes 11 Russian systems, and the Lomonosov supercomputer, owned by Moscow State University, is in the top ten. The formation of the global satellite constellation GLONASS has been completed, and in the near future the massive use of satellite navigators of the system will begin, but it is increasingly difficult for Russia to maintain its positions in space: there are too many unsuccessful launches. D. Rogozin, who oversees the defense industry and the space industry, spoke quite harshly about the situation in the industry: “As long as the youngest director of the Roscosmos enterprise will have 62 goals, we will only dream of rovers, and Phobos will fall into the ground ... the space sector lacks people: the existing staff is aging, in the 1990s there were almost no specialists, and young people do not want to go into the industry, although

today decent salaries are offered [16].

In 2012, Russia lost its leadership in the number of launches. Back in 2011, Russia was the first (32 launches, 5 unsuccessful), overtaking China (19 launches, 1 unsuccessful) and the United States (18 launches, 1 unsuccessful). And according to the results of the first half of 2012, for the first time, China became the leader in the number of launched space launch vehicles. At the same time, the Americans - Brigadier General Kevin Ryan and Harvard University Researcher Simon Sarajyan - rightly note: “Russian spaceships are currently the only means of delivering American astronauts to the International Space Station and back. Russian engines provide launches of American rockets that put military cargo into orbit. Russia has become the sole supplier of plutonium fuel for the batteries that power the main instruments of American interplanetary spacecraft ... At the same time, Russian rocket scientists could not expand their activities if they did not receive hundreds of millions of dollars for launching American astronauts and cargo into space. An example of a successful exchange of space technologies between Russia and the United States is the ongoing supply of RD-180 engines from Russian NPO Energomash to Lockheed Martin for use in Atlas-5 rockets. Atlas 5 is one of two launch vehicles used by the US government to launch military satellites into orbit. Russian technologies are also used in commercial space exploration by private companies such as Orbital Sciences, and it is equipping its Taurus II launch vehicles with Russian-made NK-33 engines. The American Mars Science Laboratory, which began work in 2012 and is designed to investigate signs of life on the "red planet", uses Russian-made plutonium-238 to power its batteries, the same source and the NASA "New Horizons" spacecraft heading for Pluto " [17, Pp. 156, 161-162].

The basis for the effectiveness of the national economy of modern Russia is, along with natural and labor resources, the scientific and technical potential of the country. The transition of the economy to a new qualitative state has increased the importance of innovation, the development of knowledge-intensive industries, which ultimately is the most important factor in overcoming the economic crisis and providing conditions for economic growth.

IV. CONCLUSION

In conclusion, it should be noted that innovations can have not only a positive, functional impact on the social sphere, contributing to an increase in the level and quality of life of people, strengthening of the country's security, but also a negative, dysfunctional impact, disrupting the environment and the balance of power in international relations. Often, the implementation of innovations causes a large number of secondary changes, the volume of which may exceed the direct effect of the original innovation, and some of them may be unacceptable. Currently, there are different points of view on the existence of a national innovation system in Russia, the level of its development and the degree of efficiency. In our opinion, despite the obvious problems of Russia's innovative development, nevertheless, a number of objective prerequisites can be identified that allow us to speak of the existence of an NIS or, at least, of the positive dynamics of its formation.

At the same time, it is difficult to disagree with the statement about the low level of efficiency of the system and its components, the presence of a number of serious limitations and problems of its further development. It is obvious that on the way to bridging the gap between potential opportunities and the final results of Russia's innovative development, an important role belongs to the formation of an adequate institutional profile of the NIS, where the main role is assigned to the state. At the same time, the state acts: firstly, as a partner with significant resources, secondly, the organizer of the development of national innovative entrepreneurship, and thirdly, the regulator of the institutional framework.

Management of innovation activities should be based on active influence on the process of creating patentable technical solutions in order to increase their productivity, both quantitatively and qualitatively. To enhance business innovation, government support is needed for the development and implementation of competitive products, necessarily based on patentable inventions. It is important to develop a system for providing incentives and subsidies to enterprises producing such products, since they incur higher costs and risks than the inventors themselves.

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РОЛЬ ИННОВАЦИЙ В РАЗВИТИИ ОБЩЕСТВА: ТЕОРЕТИЧЕСКИЕ ПОДХОДЫ И ОПЫТ РОССИИ

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Аннотация

В современных условиях основой динамичного развития любой экономической системы является инновационная деятельность, обеспечивающая высокий уровень ее конкурентоспособности. Степень развития национальной инновационной сферы составляет основу устойчивого экономического роста и является необходимым условием полноценного участия страны в мировом разделении труда.

В статье рассматриваются основные направления инновационных исследований. Авторы анализируют роль инноваций в развитии России.

Ключевые слова: инновации, инновационный процесс, типология инноваций, «Ростехнологии», РОСНАНО.

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