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Implementation of the state policy in the field of innovation

N.M. Tyukavkin

Samara National Research University, Samara, Russian Federation E-mail: tnm-samara@mail.ru. ORCID: http://orcid.org/0000-0001-6049-897X

Yu.V. Matveeva

Samara National Research University, Samara, Russian Federation E-mail: dr.ymatveeva@ssau.ru. ORCID: https://orcid.org/0000-0003-4755-226X

Abstract: In the Strategy of scientific and technological development of the Russian Federation, the main goal is to ensure the competitiveness and independence of the state by forming an effective system of the most complete application and development of the intellectual potential of the state. The main directions in the work of the Government of the Russian Federation, for the period up to 2024, is the formation of conditions for the entry of the Russian Federation into the top five leading countries in the field of R & D, represented by the priorities of scientific and technological development of the state, determined by this Strategy. These areas are represented by the Program, which is the main mechanism for implementing the Strategy. It is aimed at increasing the socioeconomic effect of applying the results of scientific research and intellectual activity, significantly increasing the efficiency of using budget funds and extra-budgetary sources to finance R & D, by switching to the « qualified customer» model. The Strategy also provides for measures to develop the «level of capitalization of the educational potential of the population» to fulfill the tasks of technical modernization of industrial production, development of entrepreneurial structures of all types, attracting talents, social mobility, ensuring the required rates of economic growth, as well as the quality of life of society

Key words: strategies of scientific and technological development; models of «qualified customer»; level of capitalization of the educational potential of the population; innovative activity; information technologies; global challenges of our time; organizational and economic mechanisms of implementation.

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Nikolay M. Tyukavkin – Doctor of Economics, professor, head of the Department of Innovation Economics, Samara National Research University, 34, Moskovskoye shosse, Samara, 443086, Russian Federation.

Yulia V. Matveeva – associate professor of the Department of Management and Organisation of Production,

Samara National Research University, 34, Moskovskoye shosse, Samara, 443086, Russian Federation.

<u>НАУЧНАЯ СТАТЬЯ</u>

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Реализация государственной политики в сфере инноваций

Н.М. Тюкавкин

Самарский национальный исследовательский университет имени академика С.П. Королева, г. Самара, Российская ФедерацияЕ-mail: tnm-samara@mail.ru. ORCID: http://orcid.org/0000-0001-6049-897X

Ю.В. Матвеева

Самарский национальный исследовательский университет имени академика С.П. Королева, г. Самара, Российская Федерация E-mail: dr.ymatveeva@ssau.ru. ORCID: https://orcid.org/0000-0003-4755-226X

Аннотация: В Стратегии научно-технологического развития РФ основной целью выступает обеспечение конкурентоспособности и независимости государства путем формирования эффективной системы наиболее полного применения и развития интеллектуального потенциала государства. Главными направлениями в работе Правительства РФ на период до 2024 года является формирование условий для вхождения РФ в пятерку ведущих стран мира в сфере НИОКР, представленных приоритетами научнотехнологического развития государства, определяемыми настоящей Стратегией. Данные направления представлены Программой, которая является основным механизмом по реализации Стратегии. Она направлена на увеличение социально-экономического эффекта от применения результатов научных исследований и интеллектуальной деятельности, существенное повышение эффективности использования бюджетных средств и внебюджетных источников на финансирование НИОКР, путем перехода к модели «квалифицированного заказчика». Также в Стратегии предусмотрены мероприятия по развитию «уровня капитализации образовательного потенциала населения» для выполнения задач технической модернизации промышленных производств, развития предпринимательских структур всех видов, привлечения талантов, социальной мобильности, обеспечения требуемых темпов экономического роста, а также качества жизни общества.

Ключевые слова: стратегии научно-технологического развития; модели « квалифицированного заказчика»; уровень капитализации образовательного потенциала населения; инновационная деятельность; информационные технологии; глобальные вызовы современности; организационно-экономические механизмы реализации.

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Информация о конфликте интересов: авторы заявляют об отсутствии конфликта интересов.

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Николай Михайлович Тюкавкин — доктор экономических наук, профессор, заведующий кафедрой экономики инноваций, Самарский национальный исследовательский университет имени академика С.П. Королева, 443086, Российская Федерация, г. Самара, Московское шоссе, 34.

Юлия Владимировна Матвеева — доцент кафедры управления и организации производства, Самарский национальный исследовательский университет имени академика С.П. Королева, 443086, Российская Федерация, г. Самара, Московское шоссе, 34.

Introduction

In the innovation sphere of the domestic economy, the goals and priorities of state policy, general requirements for the innovation policy of the subjects of the Russian Federation, the prospects for its development are determined by the state program of the Russian Federation «Scientific and Technological Development of the Russian Federation», developed in accordance with the Federal Law «On Science and State Scientific and Technical Policy» of 23.08.1996 for No. 127-FZ, with subsequent amendments [1]. Innovative development is the basis for the development of the Russian economy.

The issues of implementing the state Strategy and policy in the field of scientific and technological development of the country, taking into account the challenges of our time, form new directions, increase the role of science and technology as a key element in solving global and national issues in the field of innovation, creating tools and opportunities for forecasting trends of world changes, taking into account internal traditions and trends, needs and expectations of the population, as well as timely identification of global challenges and effective response to them.

In the Strategy of Scientific and technological Development of the Russian Federation, the main goal is to ensure the competitiveness and independence of the state by forming an effective system of the most complete application and development of the intellectual potential of the state [10]. The strategy provides for the achievement of long-term development goals of the state, up to 2030. The main directions in the work of the Government of the Russian Federation for the period up to 2024, which were approved by the Chairman of the Government of the Russian Federation on 29.09.2018, are the formation of conditions for the entry of the Russian Federation into the top five countries in the world in the field of R & D, designated by the priorities of scientific and technological development of the state, determined by this Strategy of Innovative Development [10].

These directions in the Strategy are represented by the Program, which is the main mechanism for its implementation. The program is aimed at increasing the socio-economic effect of applying the results of scientific research and intellectual activity, significantly increasing the efficiency of using budget funds and extrabudgetary sources to finance R & D, by switching to the implementation of the «qualified customer» model, the formation and development of which is included in the action plan «Strategy of scientific and technological development of the Russian Federation for 2017–2019», approved by the Government of the Russian Federation dated 24.05.2017 for No. 1325-R. In addition, this Strategy provides for measures to develop the «level of capitalization of the educational potential of the population» to fulfill the tasks of technical modernization of industrial production, development of entrepreneurial structures of all types, attracting talents, social mobility, ensuring the required rates of economic growth, as well as the quality of life of society [9].

The main part. Within the boundaries of the Program implementation, there are directions for solving the tasks of the state policy in the field of higher education, which are aimed at forming a significant level of integration of higher education into the innovative development of the country, improving the quality and relevance of educational programs, their demand in the world education markets, effective training activities for the scientific, industrial, educational and social spheres, as well as basic, high-tech economic activities. The program is aimed at implementing the basic principles of state policy in the field of scientific and technological development of the Russian Federation, which are « reflected in the Strategy:

- organization of systematic state support, namely: the creation of a full cycle of production of new knowledge, the formation of new»end-to-end «technologies, breakthrough products (services), the formation of new markets, support for scientific, high-tech projects at all phases of their implementation and the creation of opportunities for unhindered communication between the stages;
- the use of a rational balance, providing for state support for R & D, in the field of solving significant tasks within the boundaries of priority areas of scientific and technological development and tasks that are initiated directly by engineers, researchers and entrepreneurship, due to the priorities of the development of new markets, science and technology;
- focus and concentration of resources on key areas, namely: focus the main direction of the resource base of innovation activities (scientific, intellectual, organizational, etc.) on supporting R & D, creating innovative products (services) that meet the global challenges facing the Russian Federation and creating mechanisms for timely identification of these challenges;
- organization of targeted support and competition: the use of public tools to ensure accessibility to the state infrastructure and the resource base of innovation activities, through the formation of rules for access to the above-mentioned resources» [10].

Taking into account the priorities of the state policy in the field of scientific and technological development of the Russian Federation, the goals of the Program « are:

- growth and development of the intellectual potential of the society;
- scientific, technological and intellectual assistance and ensuring the structural adjustment of the economy;
- effective formation, organization and technological development of scientific and innovative activities» [10]. To fulfill the above goals, you need to solve the following tasks:
- to create conditions for the development of talents and professional skills of scientific, industrial personnel and business, by strengthening the impact of science on the state, increasing the value of intellectual activity, increasing funding and investment in R & D, modern infrastructure and the quality of the population on the basis of scientific and technological development;

- to carry out the transformation of the system of higher professional education, the formation of conditions for the growth of its competitiveness and the development of export potential necessary for a timely response to the global challenges of our time;
- to ensure the reduction of losses and risks of investments in the economy, ensuring the effective use of the creative potential of society, by supporting innovative initiatives and creating an effective system for protecting the results of R & D;
- to achieve results, the use of which forms a multiplicative effect in the economy, in the export potential of the country, as well as improving the quality of life of society, by focusing on the creation of «end-to-end technologies», the implementation of commercially attractive scientific and technical entrepreneurial programs, and high-tech innovative projects;
- to form the infrastructure and information support for scientific and innovative activities through its rapid growth, taking into account the Forecast of scientific and technological development of the Russian Fed- eration for the period up to 2030 and ensuring accessibility to it [7];
- to develop and implement international and national infrastructure projects of the «megasience»type, with the conditions for the formation and concentration of the country's scientific, technological and innovative potential;
- to form an effective system of organizing R & D on the basis of cross-innovations, providing significant rates of mastering new knowledge, reducing costs, effective interaction of subjects of scientific, technical and innovative activities.

In 2019–2020, the Federal Target Program «Research and development in priority areas of development of the scientific and technological complex of Russia for 2014–2020» was implemented. Certain areas of which (Program 1) have been included in the implementation since 2021. The competitiveness of the scientific and technological sphere of Russia is formed not only by the system mechanisms and tools of state support for R & D, but also by the quality of its organization, which must meet the global challenges of our time and, first of all, the changes that are caused by the development of digital technologies. In addition, the Program defines financial support for the formation and implementation of organizational and technical mechanisms: starting from forecasts and analytics to digital platforms where scientific and technical projects are created, the results of intellectual activity are involved in economic turnover [11].

Within the framework of the conducted research, the author identifies the places that the Russian Federation occupies in various areas of scientific and innovative activity, and also offers a forecast for the development of these areas (Table 1).

Dynamics of indicators of the Russian Federation [14]: by the number of researchers among the leading countries of the world (according to the OECD); by the presence of universities in the top 500 global rankings; by the number of articles determined by the priorities of STD in publications indexed in international databases; by the number of patent applications in the priority areas of STD; by the number of international projects of the «megasience» class implemented in the territory of the Russian Federation; by the number of world-class scientific centers; according to the number of world-class RECs based on the integration of universities, scientific organizations and the real sector of the economy, it is represented by positions that reflect positive results.

Analyzing Table 1, it can be seen that the Russian Federation occupies 53rd place in the global ranking of the competitiveness of minds and talents, and taking into account the forecast, by 2030, it will rise to 43rd place. This indicator has an unsatisfactory value, an unacceptably low value for a country like Russia, with its talents and intellectual capital.

The main indicators of the development of R & D infrastructure, costs and revenues from innovation activities are presented in Table 2.

The indicator «index of demand and availability of scientific, technical and innovative information infrastructure» in 2020 is 28 %, with a forecast of its development by 2030 to 41 %. In 2020, the low degree of demand for infrastructure is determined by the level of development of innovation activity, which currently is unacceptably low – up to 12 %.

The ratio of the growth rate of domestic R & D expenditures to the GDP growth rate is from 1.01 to 1.02 %. This indicates that the share of R & D costs in the Russian Federation is 1%, while in developed countries this indicator reaches the value of 7–9 %.

Table 1 – Forecast of scientific and technological directions of development of the Russian Federation [7]

Indicators	2020	2021	2022	2024	2026	2028	2030
The place of the Russian Federation in the global ranking of the competitiveness of minds and talents, the place	53	52	51	49	47	45	43
The place of the Russian Federation in the number of researchers among the leading countries of the world (according to the OECD), places	5	5	4	4	4	4	4
The place of the Russian Federation in the world by the presence of universities in the top 500 global rankings, places	10	10	10	10	10	10	10
The place of the Russian Federation in the number of articles determined by the	8	5	5	5	5	5	5
The place of the Russian Federation in the number of articles determined by the priorities of the NTR in publications indexed in international databases, places	7	5	5	5	5	5	5
The number of international projects of the «megasience»class implemented in the Russian Federation, units	4	4	4	4	4	4	4
The number of world-class scientific centers, units.	7	10	16	16	16	16	16
The number of world-class RECs based on the integration of universities, scientific organizations and the real sector economy, units	10	15	15	15	15	15	15

Table 2 – R & D expenditures in the Russian Federation [3]

Table 2 R & D expenditures in the Russian Federation [5]									
Indicators	2020	2021	2022	2024	2026	2028	2030		
Index of demand and availability of scientific,	28	30	36	38	39	40	41		
technical and innovative information infrastruc-									
ture, %									
The ratio of the growth rate of domestic R & D expenditures to the GDP growth rate, units	1,02	1,02	1,02	1,01	1,01	1,01	1,01		
The ratio of the volume of funds from extra- budgetary sources for the implementation of scien- tific, scientific and technological activities and the volume of budget funds for the implementation of scientific, scientific and technological activities, billion rubles	55	53	56	58	63	68	75		
The ratio of the volume of extra-budgetary financing of R & D and the volume of federal budget funds for the implementation of R & D, billion rubles	150	160	170	170	200	200	230		
The level of income of universities from the implementation of additional educational programs, %	11	14	15	15	15	15	15		
The level of budget expenditures onfundamental research in the country's GDP, %	0,13	0,14	0,14	0,38	0,38	0,38	0,38		

The volume of extra-budgetary financing of scientific, scientific and technological activities corresponds to the volume of budget funds, with their subsequent decrease. The level of budget expenditures on basic research in the country's GDP is 13 % in 2020, with an achievement of up to 38 % according to forecast indicators.

The analysis of the intellectual capital of the Russian Federation engaged in innovative activities is presented in Table 3.

The share of researchers under the age of 39 in 2020 is 45.6 %. By 2024, it is planned to reach the value of 51.5 % and continue to hold it. The number of researchers under the age of 39 who have a candidate (doctor) degree in 2020 is 25.5 %. This indicator has a low value.

The number of areas of scientific specialization in which the Russian Federation is among the top ten leaders is also low -12-14 units. The increase in the number of patents for inventions is planned to increase by 2 times by 2024.

Subprogram 2 of the State Program of the Russian Federation «Scientific and Technological Development of the Russian Federation» is aimed at creating accessibility of the sphere of higher education, developing the level of its competitiveness and export potential on a global scale, as well as creating a system of continuing education based on innovative educational technologies of higher education.

Within the framework of this Subprogram, the implementation of financial support for the activities of the higher education system is provided, aimed at [10]:

- development of fundamental scientific research in the field of innovation;
- implementation of expenses for basic and applied scientific research;
- development and implementation of new educational programs, including online learning programs and the use of network platform products;
 - organization of practice-oriented training and project-based training programs;
 - purchase and purchase of modern technological equipment;
- modernization and additional equipment of the material and technical base of laboratory, research and educational buildings;
 - construction of new educational campuses and educational infrastructure;
 - the organization of works on overhaul (Table 4).

Table 3 – Analysis of the intellectual capital of innovation activity [3]

Indicators	2020	2021	2022	2024	2026	2028	2030
Percentage of researchers under the age of 39 years of the total number of researchers, %	45,6	47	49	51,5	51,5	51,5	51,5
Percentage of researchers under the age of 39 years of the total number of researchers, %	25,5	25,5	26,1	26,7		ı	1
The number of R & D grants issued to graduate students, units.	1500	1000	1000	1000	_	ı	1
The number of domestic copyright holders of intellectual property objects, units.	5800	5800	6000	6200	6300	6500	6500
The share of articles co-authored with foreign scientists indexed in international scientific citation systems, %	28,7	29,3	30,2	30,6	30,9	31,2	31,2
The share of scientific publications of Russian researchers indexed in international scientific citation systems, %	33,9	34,1	34,3	34,4	34,5	34,6	34,8
The number of areas of scientific specialization in which the Russian Federation is among the top ten leaders, units.	12	13	14	14	14	14	14
Increase in the number of patents for inventions, thousand units.	0,1	0,21	0,36	0.5	-	-	-
Index of technological dependence, %	170	200	250	250	250	250	250
Level of educational institutions of higher education, %	40	50	60	70	77	80	82

The development of the competitiveness of universities on a global scale, within the limits of their participation in the global sectors of science and technology, requires strict coordination and implementation of relevant educational programs, as well as the widespread introduction of online learning in the new educational formats that provide training to new and, above all, technology markets, involving the development of with capitalization level of educational potential of the population».

The creation of a positive image of the Russian Federation on the world stage will be formed through the export of educational products and the attraction of talents from foreign countries, which is important in the context of global competition for human capital (Table 5).

Subprogram 3 provides for the formation of new applied scientific knowledge necessary for the long-term development of the Russian Federation and the creation of a competitive state, to ensure readiness for the

analysis of global challenges and productive responses to them. The creation and implementation of new applied scientific knowledge is the basis for the formation and operational implementation of innovative projects that provide scientific, technological and intellectual structural changes and economic renewal, improving the quality of life of society and the national security of the state [11].

Table 4 – Dynamics of indicators of accessibility of higher education, development of the level of its competitiveness and export potential on a global scale [14]

1 1 9							
Indicators	2020	2021	2022	2024	2026	2028	2030
The number of Russian universities included in the global rankings,%.	48	49	50	50	50	50	50
The number of Russian universities included in the top 100 global rankings for at least 2 consecutive	11	12	13	13	13	13	13
years, %	12	13	14	14	14	14	14
The number of areas of scientific specialization in which the Russian Federation is among the top ten	12	13	14	14	14	14	14
leaders, units.		00	00	00	00	00	00
The share of universities that carry out educational activities according to educational programs of higher education using federal digital platforms, %		90	90	90	90	90	90
The number of competence centers of the «National Technological Initiative», units	14	14	14	14	14	14	14

Table 5 – Indicators of human capital development [5]

Indicator	2020	2021	2022	2024	2026	2028	2030
S							
Percentage of graduates who found a job in the	76	78	81	83	85	87	90
next year after graduation, %							
Number of foreign citizens, full-time students in	268	302	382	425	425	425	425
the programs of universities, thousand people							
The number of citizens who annually undergo	1800	1900	2100	2700	3000	3000	3000
training in continuing education programs at							
universities, thousand people							
The number of users of the integration platform for	3000	9000	15000	15000	15000	15000	15000
continuing education, thousand people							
The number of domestic and foreign scientists	28,1	28,9	30,8	31,6	32,4	32,8	33,2
working in the Russian Federation, having articles							
in scientific publications of the first and							
second quartiles, international databases,							
thousand people							

In this regard, the author proposes additions to the «qualified customer» model, which provide for a new approach to the implementation of R & D in high-tech sectors of the economy and a departure from the policy of imitating innovations. The author proposes to supplement this model with new key elements:

- to introduce an element of state coordination in the processes of scientific research and R & D management, according to the directions and priorities of scientific and technological development, using the principles of scientific and technological initiative and the development of future markets. For this purpose, it is proposed to form a new structure PPP R & D [4;12];
- as a guarantor of the commercialization of R & D, to create a digital information platform for the selection of innovative projects, with their subsequent testing in the real sector of the economy. The initiator of the creation of this platform and its owner should be potential co-investors involved in the implementation of innovative projects;
- the distribution of investment funds in innovative projects should be carried out on the terms and principles of PPP, taking into account the following provisions: investment in basic research public financing, applied R & D private financing.

As a result of the implementation of this model, we ensure the concentration of resources on the main directions of the development of new technologies through the implementation of scientific, technical and in-

novative projects that create the possibility of redistributing investment resources and creating a co-financing mechanism within the framework of state programs and projects of the Russian Federation [13].

The author also suggests the advanced development of the R & D infrastructure and information support for innovation activities; the creation and implementation of international projects of the «megasience»class; the development of the system of international integration in the field of innovation.

Conclusions

- 1. The paper presents an analysis of the innovation legislation of the Russian Federation and the forecast of scientific and technological development of the state for the period up to 2030.
- 2. The main indicators of the development of R & D infrastructure, costs and revenues from innovation activities of the Russian Federation are presented.
- 3. The analysis of the intellectual capital of innovation activity is carried out and measures for the development of the «level of capitalization of the educational potential of the population» are proposed.
- 4. Additions to the «qualified customer»model are proposed, providing for a new approach to the implementation of R & D in high-tech sectors of the economy and a departure from the policy of imitating innovations.

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