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**FORMATION OF THE INTELLECTUAL POTENTIAL
ON THE BASIS OF THE NATIONAL INNOVATIVE
ECONOMY STATE SUPPORT**

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**ФОРМИРОВАНИЕ ИНТЕЛЛЕКТУАЛЬНОГО ПОТЕНЦИАЛА
НА ОСНОВЕ ГОСУДАРСТВЕННОЙ ПОДДЕРЖКИ
ИННОВАЦИОННОЙ ЭКОНОМИКИ СТРАНЫ**

The article focuses on the formation of the intellectual potential in Russia. Analyzed is the state policy in the field of science, the key trends and prospects having been identified. Particular attention is paid to the development of universities as incubators of the national intellectual resource. Identified and described are the peculiarities of the knowledge-based economy.

INTELLECTUAL POTENTIAL; KNOWLEDGE ECONOMY; STATE SUPPORT; INNOVATION; UNIVERSITY; COMPETITIVENESS; BUSINESS-ENVIRONMENT; SCIENCE.

Статья посвящена вопросу формирования интеллектуального потенциала в России. Проведен анализ политики государства в области науки и выявлены основные тенденции и перспективы. Особое внимание уделено развитию вузов как инкубаторов интеллектуального капитала страны. Выделены и описаны характерные особенности экономики знаний.

ИНТЕЛЛЕКТУАЛЬНЫЙ ПОТЕНЦИАЛ; ЭКОНОМИКА ЗНАНИЙ; ГОСУДАРСТВЕННАЯ ПОДДЕРЖКА; ИННОВАЦИИ; ВУЗ; КОНКУРЕНТОСПОСОБНОСТЬ; БИЗНЕС СРЕДА; НАУКА.

At the end of XX century the mankind entered the phase of constructing the post-industrial society, in which the increasingly important role is played by the economy based on the priority of human capital due to the socio-economic revolution developing worldwide.

At the basis of each socio-economic revolution there are internal technological systems, scientific – technical conceptions and production relations.

For the post-industrial society of great importance, first of all, are information technologies and computerized systems, high production technologies, as a result of the new physical-technical and biological-chemical principles, as well as innovative technologies, innovation systems and the innovative arrangement of various areas of human activity based on them.

The final result, in our opinion, should be the creation of a new form of the economy organization – the knowledge-based economy based on the state support of the intellectual

potential formation. Creating the knowledge-based economy is the strategic direction of development of Russia in the XXI century. *The key to economic growth in the modern world is knowledge.* It is the intellectual capital that ensures the economic and social welfare of the country.

The intellectual capital as a notion appeared not so long ago. In 1969, D.K. Galbraith defined the term «intellectual capital» as something wider than «pure mental capacity» of man, including certain intellectual activity. Since then, researchers have repeatedly revised and expanded the definition of the intellectual capital. For example, E. Brooking argues that «the intellectual capital is a term referring to intangible assets, without which the company cannot exist, *increasing competitive advantage.*

Components of the intellectually capital are human capital, structural capital and customer capital.

We should agree with the opinion of Professor E. R. Schislyaeva that one of the



factors increasing the efficiency of the HR management system is the optimal planning of human resources based on staffing needs, variable costs on personnel, their development, as well as assessment of the effectiveness of each individual employee performance [1, p. 109].

The latter stipulates the investment approach to the accumulation of the intellectual capital of the company, which is impossible without state-supported organizational system of innovations in the human capital. Thus, the question arises about the state support to ensure the formation of intellectual capital on the basis of the innovation-driven economy.

Innovations are seen as a new or significantly improved product (goods and services) or process, introduced into practice; a new sales method or a new organizational method in business practices, workplace organization or external relations [2, paragraph 12 p. 2].

The process of forming the intellectual capital of the organization as such is the organizational and managerial innovation that provides the timely technological transformation by the changes in the company management in order to improve the control system capacity for technological innovations.

At the same time organizational and managerial innovations are determined by the needs of innovation development in the industrial-technological sphere [3, p. 255].

Proceeding from the fact that the organizational and management innovations achieve their goals depending on the amount of the intellectual potential, which has been invested in the innovations initially [4, p. 267], while the innovations involve the continuous current of different solutions developed and upgraded in certain areas, it can be shown that the formation of the intellectual capital is provided by the flows of knowledge within the national innovation system, supported by the state.

The team of scientists from International Graduate School of Management supervised by Professor E.R. Schislyeva have reviewed the concepts of national innovation system well-established in foreign literature [3, p. 257].

In general, obvious is the trend of the evolution in the concept of national innovation system from the «network of cooperating institutions in the public and private sectors»

(Freeman, 1987), to the concept of «interacting elements and relations within the nation state» (Lundvall, 1992), further on to the «interaction of the institutions» (Nelson, 1993) and after that to the «body of knowledge of national institutions» (Patel and Pavitt), which ultimately led to the realization the national innovation system as «a system of interconnected institutions, supposed to create, store and transfer knowledge» (Metcalf, 1995).

Alongside with this [3, p. 256 – 257], it is shown that the approach to the national innovation system should not be limited to the inclusion innovative companies, research institutes and universities into the state system without separately allocated self-regulatory organizations (self-regulatory organizations), as carriers (proponents?) of innovation, as well as the main organizers of the interaction of the business communities and consumers in the long term results of basic research conducted in the academic environment.

Having analyzed the modern tendencies of economics development in the leading Western economies we can state that an innovation economy is the economy of a society based on knowledge, innovations, new machines and technologies, on the readiness to implement them into various fields of human activity.

It highlights the special role of knowledge and innovation, first of all, of scientific knowledge. In the innovative economy under the influence of scientific and technological knowledge, the traditional spheres of material production are transformed, modifying their scientific and technical facilities, due to the fact that the production which is not based on new knowledge and innovations becomes unsustainable in the innovation economy.

The knowledge based economy is primarily determined by the continuous growth of R & D in the overall costs incurred by public and private companies, together with a continuous growth of the academic research institutes plough-back.

The research results demonstrate the stable growth of the intellectual capital, which is not connected directly with material values and is determined primarily by the human and structural capital (registered patents on-hand, instructions and methods of work, the system of the company organization and so on).

The economic policy plays the major role in the development of the innovation process, while dissemination of knowledge and innovations require a strong research base, which would be able to generate new ideas and new forms of cooperation between the research and production sectors.

The formation of effective mechanisms of knowledge commercialization, which is understood as the process of transforming knowledge into a product, service or activity supposed to be profitable, makes it possible to rapidly solve such strategically important for the

country tasks as maintaining the economic growth and competitiveness in world markets, the increase of employment, preserving the environment and improving the quality of health care.

Diagram 1 shows a significant dynamics of expences for research. This indicates that the direction of public policy in this area is correct.

Of paramount importance for the knowledge based economy are prediscovery and specific developments. Diagram 2 shows the decrease in the number of organizations engaged in research and development.

Diagram 1

Financing science from the federal budget [5]

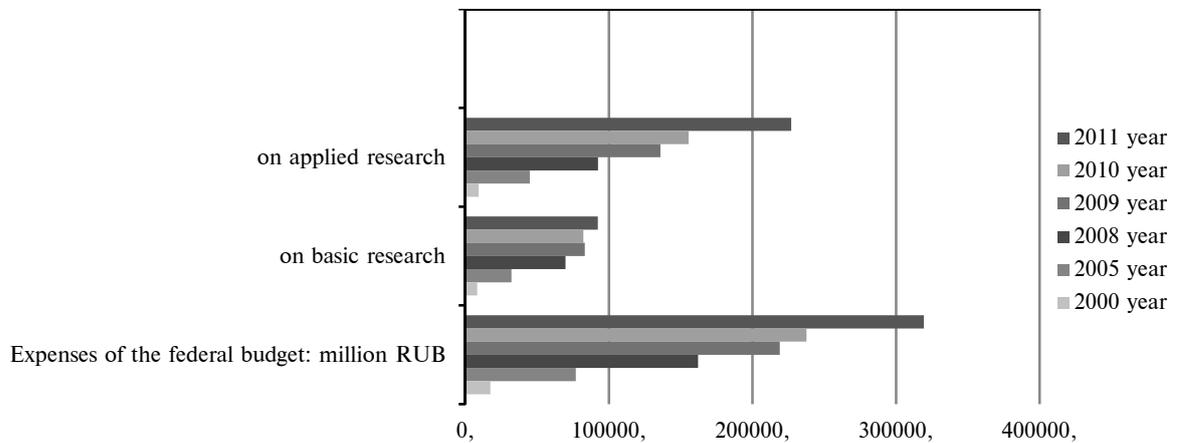


Diagram 2

Organizations performing scientific research and development [5]

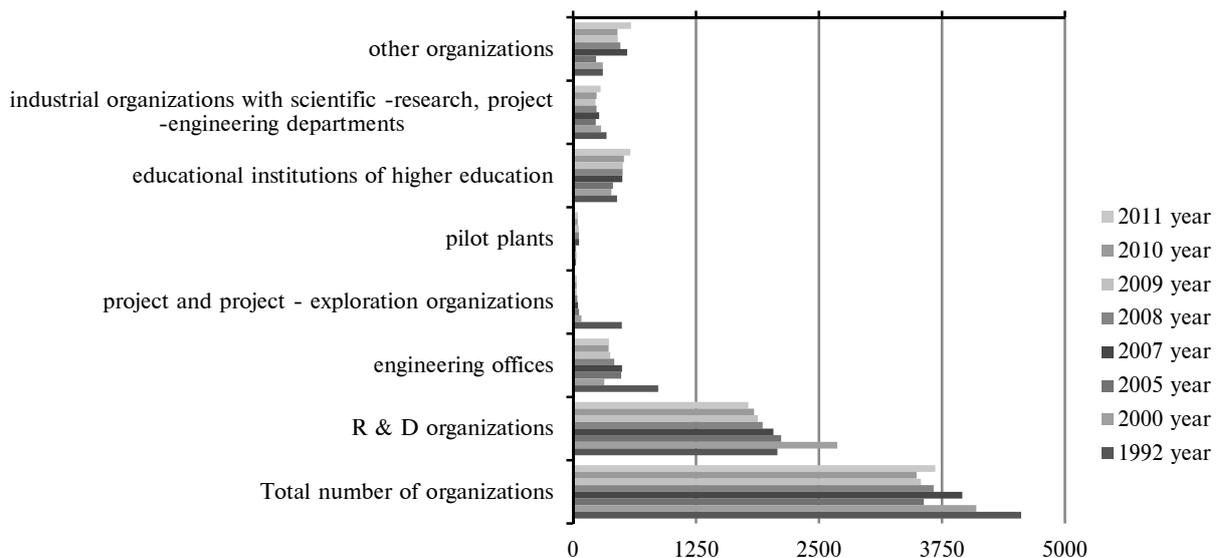


Diagram 3

The number of personnel employed scientific research and development
(at the end of the year; thousand persons) [5]

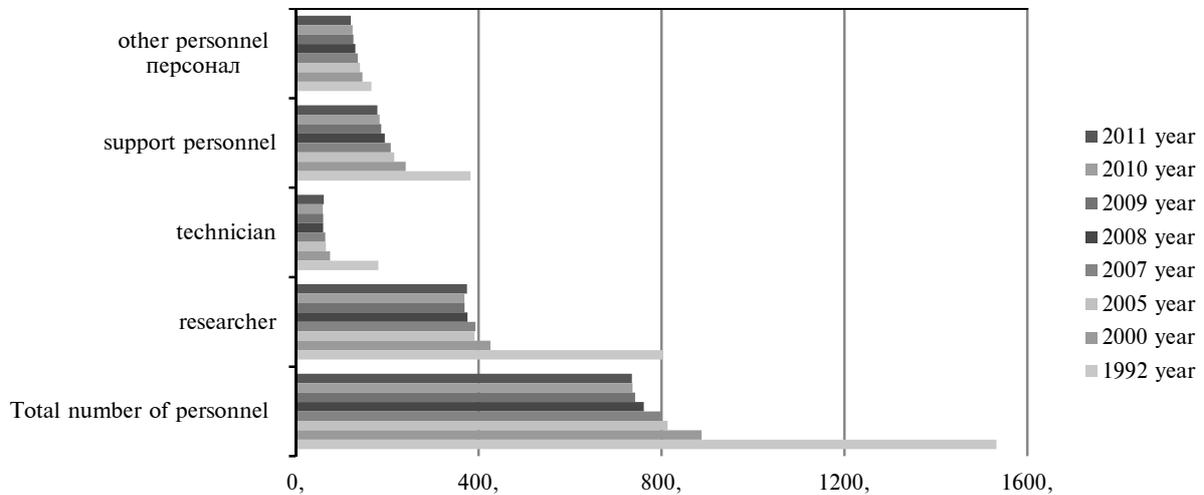


Diagram 3 shows the decrease in the number of personnel engaged in research and development. The decline of these indicators is unacceptable for a country committed to develop the knowledge based economy. Reducing the number of organizations provides more control over their activities, and therefore, over the allocated resources, at the same time it is a slight advantage in comparison with the emerging shortage.

Nowadays the innovative development becomes the most important element of social and economic development of countries and regions. At the microeconomic and macroeconomic levels, the innovations are becoming increasingly important for sustainable national economic development, because it allows enterprises to respond to the increasingly complex requirements of customers, ahead of the competition in the domestic and international markets, to raise their productiveness.

Innovation is the end result of R & D with the aim to obtain economic, social, environmental, scientific, technical or other effects.

In modern conditions it's necessary to transfer to the effective restructuring of the economy, formation of competitive innovation economy based on knowledge.

The end result of this transition should be the creation of a new form of economic organization – the innovation economy.

Innovation infrastructure is the main tool for building an innovative economy, it is able to raise

the country's economy at a very high level. Based on this understanding, innovation infrastructure is presented as a set of interrelated, complementary production and technical systems, organizations, firms and related organizational and management systems necessary and sufficient for the effective implementation of innovation and implementation of innovations. [6. p. 112]

The steady economic growth is achieved through knowledge based innovations. (Fig. 1).

The state scientific-technical and innovation policy is aimed at development and effective use of the scientific-technical and innovative potential, as well as material and financial resources allocated for the creation of high technologies, promoting the development of innovative projects, high-tech, competitive products and the resulting expansion of the tax base for the benefit of the population.

However, the development of science, the use of its achievements cannot be ensured by the market mechanism. It is necessary to have the comprehensive state support for research, which is explained by the fact that purely commercial interests of individual private enterprises rarely match the national economic interests, together with that being conducted in more specialized areas. State measures in support of science incarnate the national policy in science and technology. It is a set of principles and practices aimed at the formation and development of scientific and technological potential of the

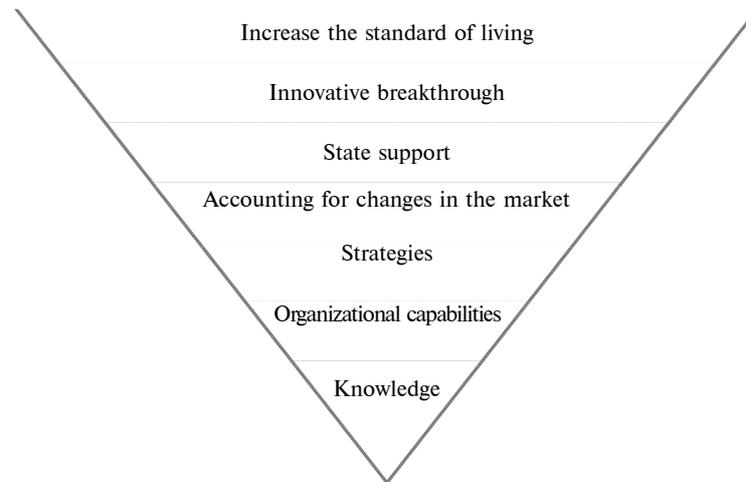


Fig. 1. Influence of knowledge on the growth of living standards.

country in order to achieve the strategic goals of the company. The objectives of the Science and Technology Policy are: government support of the national science; encouraged development of its priority areas being of national importance; providing conditions for the implementation and effective use of scientific advances in the field of production. The ultimate goal of science and technology policy is to ensure economic growth, the country's competitiveness in the world market, solution of social problems, economic security.

Unfortunately, the state policy in the field of science is not always appropriate. It is impossible to disagree with the R.S. Grinberg's opinion that supporting the desire to reform the State Academy of Sciences, Russia will soon be stripped of its own national fundamental science. The scientific and educational potential of the Russian Federation will be allotted the same fate as the USSR [7–9].

Education and science in the country are directly interlinked. But science is less inert than the educational system, and during the years of reform, it has undergone very significant changes.

For formation and advance of the national innovation economy it is necessary to develop the appropriate infrastructure: technology parks, innovation and technological centers, innovative-industrial complexes, science cities.

Today in Russia there are more than 80 industrial parks mainly at higher educational institutions, and this is not by accident.

Since the 1990s, innovative activities in Russia have been closely connected with the system of higher education and are implemented along two main directions:

- implementation of innovative programs;
- creation and development of different scientific-technical and innovative organizational structures (technoparks on the basis of leading national universities, innovative-technological centers, innovative-industrial complexes, certification and commercialization, innovative businesses).

Science is a special field of activities, whose very existence and development is included into the state needs. In the modern world science is the major strategic resource to develop knowledge based economy.

The main factor determining the effectiveness of science in the national innovation system is the effective cooperation between the academic community and business environment.

In 2005, the volume of innovative products was the largest in St. Petersburg (10410.7 mln.), Novgorod (9956.1 million) and Vologda (10106) areas. Considering the volume of the innovative products output in 2009, the top leader was St. Petersburg (49295.8 mln.), the rate of the index being reduced in other regions, with it being even lower than 900 million rubles in some of them [5].

It is not by accident that St. Petersburg occupies the leading position. In year 2013 the Ministry of Education and Science of the Russian Federation held a competition for participation in implementation of the program to increase competitiveness of Russian Universities «5 in 100». Following the results of the competitive selection there were selected 15 best Universities of Russia.

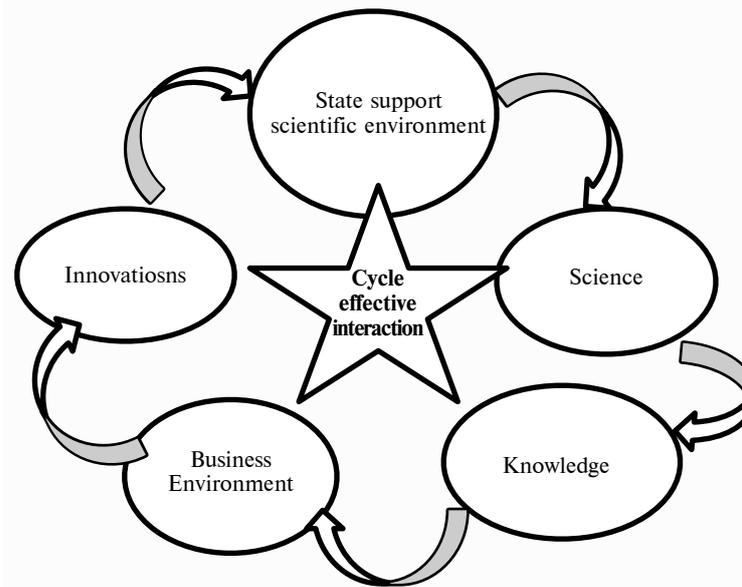


Fig. 2. Mechanisms for effective interaction between the state and the business environment for the success of innovations

The list includes 3 Universities from St. Petersburg: Saint Petersburg Electrotechnical University «LETI», St. Petersburg national research state Polytechnical University, St. Petersburg state University of information technologies. The number of Russian universities, which will be provided support by the state to improve their competitiveness reduced to 14.

At the end of March at the conference «St. Petersburg for education and reform: education and cities of the world» the Deputy head of the Ministry of education of the Russian Federation Alexander Povalko informed the audience about it. From the list was excluded St. Petersburg state electrotechnical University (LETI) who failed to «defend» their road map (their competitiveness programs).[10]

The main aim of the program – by 2020 to make it secure that at least five Russian universities enter the list of the top hundred leading universities in the world according to the QS World University Rankings. The SPbSPU is actively implementing the program «5 in 100», the SPbSPU strategic goals being upgrading and development as a modern dynamically progressing university and a globally competitive research and educational center striving to integrate multidisciplinary research and world-

class technology and to be among the world's leaders in education [11].

Implementation of this program will be an effective starting point for increasing the competitiveness of higher education in Russia, the SPbSPU being an incubator of intellectual potential of the country.

All this must be considered in the search for the answers to the challenges that the modern epoch throws to Russia.

The support and encouragement of scientific, scientific – technical and innovative activities have recently become an important strategic goal of the Russian Federation. Effectiveness and feasibility of these actions are indisputable.

The necessity of state support can be considered as generally accepted, but it does not simplify the search for new methods, schemes and mechanisms adequate to the objectives of the state development, priorities of the science policy and the state of the economy in general.

Based on the analysis in the article, it can be seen that there can be traced some improvement in the government support. One of the innovative methods of state support of the intellectual capital development has been recently found and is currently being successfully implemented. The program of state support for increasing the competitiveness of universities «5-100-2020» is an

innovative way of development of science in Russia.

So what are the next steps of the government that will be focused on the efficient development of the Russian science?

Obviously, the basis of the Russia development should become creation of a new form of economy – the state supported knowledge based economy aimed at the formation of the intellectual potential.

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