

## Problems and prospects of the Russian IT sector in the world market of high-technology products

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**Abstract.** The article gives a brief overview of the status of the world and Russian market of high-technology products, in particular, innovation and information technology products. The ways of development and support of high-technology sector of developed countries' economy were explored. It presents the analysis of special-purpose programs of support, protection, patenting and licensing high-tech products in these countries and also the analysis of development of world's scientific and technical trends. The preliminary prediction about technological development of Russian economy on the present stage was made and the state of the national Russian economy on the world market of innovative products was assessed. Special attention was paid to protection of intellectual property in Russia in the sphere of support of high-technology export and also key directions of enhancement of cooperation in Russia's and China's high-tech sector.

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### Introduction

According to international and Russian analysts, Russian market entered critical stage of development when the necessity of enhancement of efficiency of export market activity increases. The problem of modernization of Russian economy is in the focus of attention nowadays and requires integrated solutions in terms of realization of internal and foreign-trade state's policy.

Modern Russian economy is sorely in need of effective and prompt raising modernization capital. This research is aimed at exposure of Russian potential in high-technology production subject to new concept of assistance to international collaboration, also it puts the accent on the Asia-Pacific countries [1]. Complex assessment of the state of modern global market of mentioned-above production in terms of statistical and structural analysis of high-tech global market indicators using the methods of STEP- and SWOT-analysis [2, 3].

### Main body

The goal of overcoming the systemic economic crisis in Russia is in putting the economy on a path of sustainable development and in changing the quality of economic growth. Here the important role of the government, its scientific and industrial policy defining the economic strategy and future development basis. It is a vital question today due to the recent political events when the probability of Russian economic isolation increases.

The development of raw materials sector that remains to be leading in the Russian economy is not able to solve the problem of the economic growth radically. The raw material sector being the basis of the industrial economy of Russia giving it a special stability could not stay her main motive power.

The innovative development and support of high-technology sectors according to the Forecast of social and economic development of the Russian Federation for 2014 year and for the planning period from 2015 till 2016 years are among the main priorities of economic policy of the country [4].

Nanotechnologies, biotechnologies, new materials and information technologies today characterize the modern developed economy and become a high-technology, leading branches using so called "smart" solutions [5]. The leading roles on the world market of innovations and high-technology products are taken by developed countries and new global players such as China and India. For instance, on the market of biotechnologies Japan have 54.7% of the Asia-Pacific market value, China 16.7%, India 8.3%. And the likelihood of new powerful entrants moving into the biotechnology market is assessed as weak [1].

Currently, the volume of the world market of high-technology products is about 3 trillion dollars; in 10 years it will be even bigger (10-12 trillion dollars). If today the ratio of high-technology and energy and raw materials markets is 4:1, then with the full transition to the sixth technological way, when paired production have the same technical level

and they are developing synchronously; so this index will be changed in scale to 10:1 [6].

The leading world countries pay special attention to the promotion of high-technology exports, as well as the protection of intellectual property, one of the basic elements of the innovative economy [7]. But as few countries make a move, others will be at a serious disadvantage [8]. Now in Russia there is a clear dissonance between the declared goals of development of innovation potential and the actual situation in the sphere of stimulation of high-technology exports. Russia lost the status of one of the largest manufacturers in the world of high-technology products it had in the USSR (Russia accounted for not less than 60% of this products industry, with 80% of military engineering products).

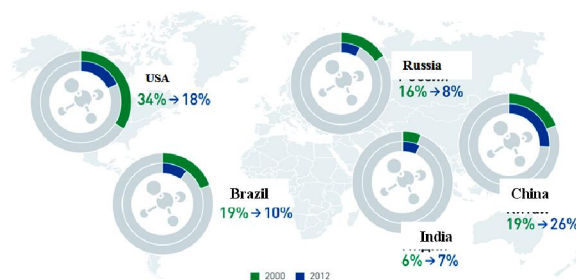
Nowadays the share of high-technology products in the structure of mechanical engineering of Russia's exports is less than 7%. For comparison, in the USA it is 27%, in China it is 29%. Last decade the share of Russia in the world market of high-technology products does not exceed 0,3-0,4%. While the Concept of long-term social and economic development of Russia till 2020 year it provides the export of high-technology products it is necessary to increase annually for 15-20%, it will be 60-100 billion dollars by 2020 [9]. Only 0.5% of Russian companies (one in every two hundred) send their products for export. For comparison: in Germany every third company exports goods. The total volume of state support of export to Russia is 0.5% from the similar support in China and 1% is in Germany. 79% of the Russian export in 2012 has raw materials but only 5% of goods with a high degree of processing, 3% has high-technology goods; 90% of them are weapons and military equipment [10].

The structure of Russian export is changing slowly. Raw materials and products with low added value, such as chemical fertilizers, equipment for metallurgical industry, petrol, technical oils and urea are still dominated. The share of machinery exports and equipment in January and December 2013 was 3.6%, and in January and December 2012 was 3.5%. Exports of this commodity group in comparison with January and December of last year, due to the growth of prices increased by 4.1%. Exports of mechanical equipment increased by 22.4%, tools and optical increased by 6.4% [6].

The analysis of world scientific and technological trends and preliminary assessment of the technological development of the Russian economy allow us to conclude that not only the most developed countries but also the new global players such as China and India could be serious competitors that may hinder the implementation of innovative

scenario of Russian development (Figure 1), having reproductive center of the economy on the latest technological facilities basis [11].

The key directions of the latest technological structure formation are biotechnologies, based on the achievements of molecular biology and genetic engineering, nanotechnologies and nonmaterial, artificial intelligence systems and global information networks. The basis of the formation of the new structure is the interdisciplinary and convergent technologies development on the basis of cross-use of achievements in the field of nanotechnology, the latest bio and information technologies and achievements in some other areas of science and technology in various combinations [12].



**Figure 1. Export of high technology products (in % from the total volume of industrial export)\***

\* Source: World Bank World Development Indicators, 2014

The approximate estimate of the national economy state in the international market of innovative products gives Patent statistics of the world intellectual property organization (WIPO) and we can analyze how effectively the available scientific potential is used. According to WIPO in the world in 205,3 thousand patent applications, which is 5.3% more than in the previous year was filed 2013 by the procedure of the Patent Cooperation Treaty. At the same time, a number of patent applications from Russia decreased by 0.4% and it was only 1087 (Table 1) [13].

The situation analysis of the last five years showed that only 15-20% of research and development performed in Russia at the expense of the Federal budget are completed by the patent.

A lot of world countries for a long time systematically develop and use the target programs of protection support, patenting and licensing of high-technology products in foreign markets. For example, in Germany, the USA, China, Canada and Norway the government subsidizes the national high-technology companies with expensive costs of patenting procedure of intellectual property objects

abroad and implementing strategies of export support in innovative sectors [14, 15].

There is no governmental institutions in Russia that support high-technology exports and innovative products is progressing with problems into the foreign markets, they do it using traditional, inefficient ways: by creating intergovernmental commissions, working groups about scientific, technical and modernization cooperation, through trade representations of Russia abroad, conducting business missions, through the work of bilateral business councils etc.

In this situation the Russian government is making decisions aimed at such gaps elimination and support high-technology companies.

The strategy of innovative development of Russia developed for the period up to 2020 aims broad support of foreign patenting creating a system of export activity of Russian high-technology companies support, such as the simplification of customs procedures, the development of trade and political diplomacy, and the removal of restrictions on access to foreign markets. In accordance with currently developed by the project of Strategy of intellectual property development, its primary goal is to ensure system reforms, aimed at creating a

competitive knowledge economy and high technologies. As a result, by 2020 the expansion of the sales volume of Russia on the markets of high-tech goods and intellectual services should reach the amount of 5-10% in five to seven sectors.

The government proposes the project of Fund of patent protection the Russian copyright holders abroad. One of the quickly developed objects of copyright in the world nowadays is computer software and databases. Along with the equipment and the corresponding services these fields are a part of a growing market of information technologies (IT) in Russia.

According to the new methodology software, services, personal computers, server hardware and storage systems printers and tablets belong to the IT market. In 2012, according to the Ministry of economic development, the volume of the IT market amounted to 716 billion rubles; in 2011 it amounted to 649 billion rubles (Table 2). According to information of the Ministry of economic development, the volume of the Russian market of information technologies in 2013 amounted to 635 billion rubles, which in comparable prices is at the level of the index in 2012, but in absolute.

**Table 1. Applications for patent number of the developed countries and Russia in 2013 [16]**

Country	Applications number	Increase for a year since 2012, %
USA	57 239	10,8
Japan	43 918	0,6
China	21 516	15,6
Germany	17 927	- 4,5
South Korea	12 386	4,5
Russia	1 087	- 0,4

**Table 2. Forecast of Russian IT market volume until 2030 year, (milliard rubles) [17]**

Volume of the market	2011 report	2020		2030		2020 by 2011, % *		2030 by 2011, % *	
		1 var.	2 var.	1 var.	2 var.	1 var.	2 var.	1 var.	2 var.
Information technologies, including:	648,6	1748,4	2082,9	4102,6	5640,4	164,1	195,3	269,6	374,8
hardware	332,5	770	862,3	1440,9	1753,1	134,4	150,5	175,8	213,9
software	132,1	462,1	582,5	1375	2073,3	223,6	281,3	467	719,9
services	184,1	516,3	638,1	1286,6	1814	178,7	221,1	312,5	451,9

In comparative prices

The Ministry of economic development has developed scenarios of IT market development for the period until 2030. Table 3 presents values of volume of the Russian IT market to 2030 by conservative (the 1st variant) and innovation (the 2nd variant) way of development. The planned volume growth in 3-7 times is expected by 2030 by separate sectors of the market.

Today according to the World economic forum, Russia is in the top 50 countries according to the level of development of information and communication technologies. The main trend of the IT market in Russia in recent years has become the decrease in the share of equipment in its general structure and the transition to the foundation markets of software and services. So, in 2012 the volume of the produced software has reached 75 billion, 60% of them were export sales.

However, in the most successful innovation sector of the country there exist constant problems:

- actual loss of the money invested in the computerization of the country from Russia and activity of offshore developers (more than 95% of the intellectual property founded in Russian IT industry is registered outside Russia);
- lack of staff and reorientation of the Russian engineering universities to service foreign technologies;
- the decline of the private sector of IT developments hampering economic modernization on the basis of home products.

To resolve the problems identified by the state represented by the Russia's Council of Ministers, certain steps are being taken, for example, the developed by the Ministry of communications; strategy of development of IT industry of Russia in 2014-2020 was approved. It is aimed at the development of the IT industry, at the increase the country's production of IT products which are potentially of high demand in the global market [18].

One can point out the following directions of activity:

- development of human capital (training and retention of staff);
- formation of a scientific base for perspective research in the field;
- support small business in the field of IT;
- development of the IT-export;
- expanding the use of IT in the national economy;
- provision of infrastructure support of all these measures, first of all, the development of broadband access.

In confirmation of the prescribed measures in June of the current year the forum "Internet-business in Russia" with participation of the President of the country; on which possibilities of cooperation of local authorities, organizations, entrepreneurs, development institutions of regional authorities to accelerate the establishment of the Internet business as a separate important industry for the economy of the country were marked.

It reaffirms the importance of the successful development of the industry for the economy of any country a mutual agreement of leading world powerful leaders –

Russia and China – on raising the effectiveness of cooperation in high-technology sectors": in the field of nuclear energy, civil aircraft, space research, Earth remote sensing, satellite navigation, study of deep space and astronautics. Such cooperation according to the opinions of countries leaders should contribute to the success held in Russia and China large-scale economic reforms, growth of well-being of people of two countries. (V.V. Putin and XI of Jingpin meeting in Shanghai, May 2014).

### Conclusion

The main expected result from a large number of programs realization in Russian IT industry, as seen by the authors, should be raising of competitiveness of Russian companies, bringing it to a global scale deducing on the flanks of the world market.

### Educts

As a result of research long-term issues and challenges and also basic factors of development of the leading sectors of Russian and industrialized countries' economy were revealed. Authors recommend develop projects in the field of technological forecasts in Russia in the direction of macroeconomic, science and technology and sectoral forecasts. At the same time, it is necessary to create united national forecast system in order to enhance the efficiency of innovative system, use national strategic for prognostication of global scientific-technological trends in the sphere of science and education. It is recommended to use corporate foresight-research in state policy formation to increase competitiveness of national producers and also for achievement of leading positions on the priority technological markets.

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