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FACTORS AND ANTAGONISMS OF DEVELOPMENT OF INNOVATIVE POTENTIAL OF HIGH-TECHNOLOGY LINES OF INDUSTRY OF RUSSIA IN GLOBALIZATION CONDITIONS

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ABSTRACT

Within this investigation it is considered the problem of detection and analysis of development factors of innovative potential of high-technology lines of Industry of Russia. In investigation the following problems were solved: carrying out the analysis of structure and content of actual statistical data; evaluation of achievement of running target indexes of Strategy of Russian Federation innovative development for period till year 2020; revealing and analyzing the factors and antagonisms of innovative development of high-technology lines of economy of Russia. During investigation it has been carried out the generalization of series of indexes of innovative activity in Russian Federation, as a result the typology of innovative activity kinds is improved; the specific singularities of structure and dynamics of indexes of industry high-technology lines are excreted. The conclusions received on poor efficacy of development of innovative potential of Russian industry are confirmed by results of comparison of Russia and some European countries per criterion of expenditures intensity spend on technological innovations and quantum of new in the market innovative goods. In structure of factors, obstructing the technological innovations, the group of "informational" factors, as the most flexible and perspective from point of view of possibilities of development of innovative activity potential is evolved. As one of the examples of "informational" factors development it is highlighted the solution of problem of information support with use of ISP-technology. Singularities of ISP-technology application are surveyed and the possibilities of raising the production efficiency of science-intensive production with their help are estimated. On the basis of revealed modifications in cooperation structure of organizations, which are realizing an innovative activity, the conclusion is drawn on models high potential: the universities - the enterprises - the state ("Triad spiral"), offered by Henry Etzkowitz.

Keywords: innovative activity indexes, industry, statistical analysis, efficacy, informational.

1. INTRODUCTION

Innovative development is chosen as one of the basic priorities of economic development of Russia. In the conditions of developing market attitudes the character of economic activity of firms, branches, regions constantly changes. More and more rigid form is accepted by competitive fight. Within the processes of globalization and integration, taking place in global-economical practice, the problems connected to competitiveness of Russian firms are stepping out into forefront (Markelov, 2009; Yakovets, 2010; Glazyev and Fetisov, 2013). Therefore the significant efforts of the state are referred on stimulation of innovative activity (HSE, 2014) and transfer of economy of Russia into innovative path of development. However for regulation of innovative activity it is required the existence of administrative information necessary for the analysis and adoption of administrative decisions. The authorities of federal and regional level with such information shall provide the statistical data.

Unfortunately, the existing organization of access to statistical data at both levels : national (informational resources of portal www.gks.ru Federal service of government statistics), and university (statistical digests of Higher school of economy, university intelligence system "Russia" www.uisrussia.msu.ru, etc.) often does not give to the principal and to explorer the necessary view of grouping data and information specification. In many respects it is not enabled the up-to-date potential of informational technologies, in particular, of multi-dimensional informational storages - data bank (by Codd, 1993). The web interface of "statistical data bank" would allow increasing multiply the flexibility of created requests, accuracy, adequacy and pertinence of created selection.

Nowadays the statistical data, including the information on innovative activity, are provided in digests and Internet resources in the form of two-dimensional Tables repulsing both: the perennial "classical" schemes of interrelations (expenditure, production volume of goods, operations, services in aspects of economic activity of organizations, etc.), and new forms of interrelations, for example, a level of organization innovative activity and the share of new to the market its innovative goods, operations and services. Therefore for detection of potential of innovative development of economy high-technology industries of Russia it is obviously necessary to solve the following problems:

- to carry out the analysis of structure and content of actual statistical data, in particular, the materials of

Higher school of economy digest "Indicators of innovative activity: 2014" (further IIA-2014);

- to estimate the achievement of running target indexes of Strategy of innovative development of the Russian Federation for the period up to year 2020 (further - Strategy-2020).
- to analyze the factors and inconsistencies of innovative development of high-technology industries of economy of Russia.

2. SOURCES OF INFORMATION AND METHODS

Information sources for examination are the articles of Russian and foreign scientists surveying the development tendencies of high technologies branches and their contribution into national economy, scientific reports on strategies of innovative development of Russia, statistics data on innovative activity in Russian Federation.

As a major statistical source of investigation has been chosen the statistic digest IIA-2014 (as HSE, 2014) as in it the most particularly considered the resource of provision and effectiveness of innovative activity, cooperation connections, economical, production and other factors obstructing the innovations. In dynamic manners in the digest the summary indexes present characterizing the development level of technological and non-technological innovations worked out according to modern standards of Organization for Economic Cooperation and Development (further - OECD) and Euro state, allowing to perform in this examination the international comparisons. Data on the Russian Federation regions in the future will allow conducting the relative analysis of innovative activity of Rostov region organizations and Southern federal district.

In examination the analysis of literature sources is implemented, the comparison of quantitative indices is carried out, by means of MS Excel 2007 package; the charts are developed for possibility of obvious justification of conclusions drawn.

3. INVESTIGATION RESULTS

(a) Generalization of several aspects of innovative activity analysis is fulfilled; methodological comments of the digest are worked out. As a result it is approved the typology of innovative activity kinds (Table-1). Analyzing the provided Table, it is possible to trace an innovation "life cycle": from idea level in scientific examination to technology and production organization; marketing strategy of goods/services promotion before improvement of human life quality and conservation of environment condition (Figure-1).

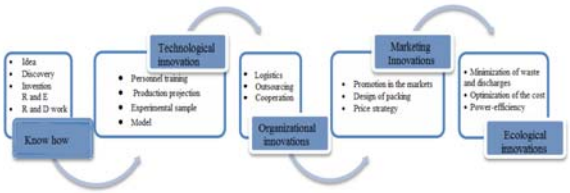

Figure-1. Innovation "Life cycle".

The picture has been drawn by authors on research materials.

Table-1. Typology of innovation activity kinds.

Innovation type	Innovation activity kinds
Technological innovations:	explorations and development; production projection; acquisition of machinery and inventory; acquisition of patents rights, licenses for use of inventions, know-how disclosure; acquisition of software means connected to technological innovations fulfillment ; instruction, preparation and personnel retraining; market researches.
Organizational innovations:	implementation of new or considerably modified corporate strategy; introduction to up-to-date methods of management on the basis of informational technologies; embedding of new or considerably modified organizational structures; innovations in use of operating time shift mode; use of up-to-date monitoring systems of quality control, certification of the goods, operations, services; embedding of up-to-date systems of logistics and deliveries of raw materials, stuffs, accessories; creation of specialized divisions on carrying out the explorations and development, practical implementation of scientific and technical achievements; embedding of corporate control systems by knowledge; implementation of measures on personnel development; implementation of new forms of strategic alliances, partnerships and other cooperation connections with production consumers, suppliers, Russian and foreign manufacturers; transmission of series of functions and business processes to specialized contractor (outsourcing).
Marketing innovations:	embedding of significant modifications in design of the goods and services; embedding of significant modifications in packaging; implementation of new marketing strategy oriented to enhancement of consumers staff or marketing outlets; use of new tricks on goods promotion; use of new sales chains; embedding of new concepts of goods presentation; use of new price strategy at trading of goods and services.
Ecological innovations:	cutting of material expenditures on production of goods unit, operations, services; cutting of energy costs on production of goods unit, operations, services; cutting of atmospheric emission of carbon dioxide; replacing the raw materials and stuffs by safety or less dangerous ones; pollution reduction of environment (atmospheric air, ground, water resources, noise level decrease); realization of reprocessing the waste, water or stuffs.

Data source IIA-2014, the table is compounded by authors on exploration stuffs.

The provided model of innovation "life cycle" (see Figure-1**)** is substantially in accordance with works of many authors (Konoplyov, 2007; Shpak, 2005, others) and it can be supplemented by classification of technology on competitiveness (Gumerov and Shaymiev, 2008) and improved in life cycle of the branch (Schwärtzel, 1998).

(b) Relatively recently into statistics has been inducted one of the most important for our investigation the analysis criterion - a degree of science intensity of industries. The very this criterion allows to excrete the hi-tech, semi-tech and low-technological industries. The conforming separation is given in statistical digest IIA-2014. The structure of economy branches includes the two large groups of economic activity types (HSE, 2014):

a) Mining, treating productions, production and distribution of electric power, gas and water:

- mining;
- treating productions:
- high-technology industries;
- semi technological branches (including the semi-tech branches of high and low levels);
- low-technological branches.

b) Communications, activity connected to use of computing equipment and informational technologies, scientific researches and elaborations, provision of other types of service.

To branches of high technologies are attributed:

- pharmaceutical production manufacturing;
- production of office inventory and computing equipment;
- production of equipment for radio, television and communications;
- production of medical equipment, gages, optic instruments and equipment, clocks;
- production of aircrafts, including the space ones.

In Tables 2, 3 the major indexes characterizing an innovative and economic activity in Russia are provided (HSE, 2014).

Table-2. Indexes of innovative activity in Russia for 2012, %.

Kinds of economic activity	**mulative level of innovation activity**	**pecific weight of workers fulfilling researches and elobaration**	**roduction share of enterprises which were realizing technological innovations**	**Share of innovated goods, operations, services**			
				Total		**From them**	
				2011	**2012**	**new implanted or being exposed to significant technological modifications**	**new to the market**
Total on Russia	11,1	2,6	49,2	6,1	7,8	5,6	1,1
Mining	8,2	1,3	5,9	6,7	6,5	4,4	0,1
Treating productions	13,4	3,2	48,0	6,8	9,6	7,0	1,7
High tech branches including:	31,3	5,9	65,9	12,1	14,3	10,1	1,9
pharmaceutical production manufacturing	23,3	2,5	48,0	14,8	15,8	13,7	0,6
production of office Inventory and computing equipment	27,3	8,4	32,6	3,3	2,2	1,6	0,7
production of equipment for radio, televisions and communications	36,3	8,0	59,3	9,8	10,5	5,5	2,9
production of medical equipment, gages, optic instruments and equipment,	30,0	6,7	63,6	13,7	15,2	10,4	3,6

clocks;							
production of aircrafts, including the space ones	36,8	3,0	83,2	12,1	16,7	12,1	0,8
Semi technological branches of high level, including:	19,3	3,0	45,4	12,8	16,1	11,3	4,1
chemical production	22,7	2,2	54,8	9,7	9,3	5,0	0,9
equipment and machinery production	16,7	4,0	33,4	5,9	6,0	3,5	1,4
electric machinery and equipment	22,1	3,7	48,3	6,2	6,6	4,5	1,0
cars, trailers and semitrailers production	23,7	2,5	42,7	23,7	31,4	23,6	10,7
production of other transportation vehicles	15,0	2,4	49,2	15,4	18,3	14,0	0,8
Semi technological branches of low level, including:	13,4	1,9	56,1	4,3	8,0	6,3	1,1
production of coke and oil products	31,7	1,6	64,2	2,3	10,4	9,1	1,1
- metallurgical production	25,1	1,8	69,8	7,2	6,6	3,7	0,8
Low-technological branches, including::	7,6	0,3	20,3	4,1	3,7	2,7	0,3
production of electricity, gas, water	5,6	0,2	33,2	0,6	0,4	0,1	0,03
Communications	13,3	0,5	31,9	3,6	2,5	2,0	1,3
Activity connected to HT and IT	9,4	10,9	14,2	12,9	6,2	3,8	0,7
Scientific researches and elaborations	30,1	43,3	57,2	23,4	30,9	15,9	5,9

Data source IIA-2014, authors' reckoning.

Table-3. Comparison of indexes of innovative and foreign economic activity in Russia for 2012.

Kinds of economic activity	Intensity of expenditures on innovations, %	Export of goods, operations, services, billion roubles	Export of innovative goods		Specific weight of organizations participating in joint projects, %
Total on Russia	1,8	6810,6	821,4	12,1	4,2
Mining	1,1	2438,9	425,0	17,4	4,3
Treating productions	2,1	4368,8	396,0	9,1	5,2
High tech branches including:	5,1	170,7	40,3	23,6	18,0
pharmaceutical production manufacturing	2,6	11,1	1,76	15,9	10,6
production of office Inventory and computing equipment	1,7	1,1	0,04	3,5	20,5
production of equipment for radio, televisions and communications;	4,7	7,1	2,06	29,0	22,5
production of medical equipment, gages, optic instruments and equipment, clocks;	6,3	28,4	7,12	25,1	15,4
production of aircrafts, including the space ones;	6,1	123,1	29,4	23,9	25,7
Semi technological branches of high level, including:	1,8	732,5	103,7	14,2	8,6
chemical production	2,5	586,8	63,0	10,7	12,5
equipment and machinery production	1,2	43,3	3,01	7,1	6,5
electric machinery and equipment	1,9	13,9	1,2	8,8	9,8
cars, trailers and semitrailers production	1,5	54,3	29,9	54,9	9,7
production of other transportation vehicles	1,3	34,2	6,5	19,1	8,2
Semi technological branches of low level, including:	2,3	3095,7	194,5	6,3	5,0
production of coke and oil products	2,5	1914,3	160,6	8,4	23,1
metallurgical production	2,9	1098,4	28,8	2,6	13,9
Low technological branchesincluding	0,9	242,6	13,9	5,8	1,5
production of electricity, gas, water	1,8	2,9	0,05	1,6	1,4
Communications	4,8	30,3	0,13	0,4	3,3
Activity connected to HT and IT	3,1	23,2	4,1	17,7	3,7
Scientific researches and elaborations	24,8	69,3	48,1	69,4	28,1

Data source IIA-2014, authors' reckoning.

The data provided allow drawing the following conclusions:

The high-technology industries distinguished in statistical digest have indeed higher values on the following indexes:

- A cumulative level of innovation activity (31,3 % on an average, the greatest value is 36,8 % in production of aircrafts, including the space ones);
- An intensity of expenditures on innovation;
- The specific weight of the workers fulfilling the investigations and elaborations;
- A share of new goods for the market in total amount of shipped production;
- A share of innovative goods in export;
- The specific weight of organizations participating in joint projects.

It's undoubtedly, the important indexes characterizing a higher level of innovative activity of high-technology industries and their particular advantages.

However, during the investigation the series of negative moments has been revealed:

It is revealed that it is not possible to estimate the achievement of majority of target Strategy-2020 indicators as in the digest IIA-2014 the other structure of data is used. In particular, in the block "Innovative business" the organizations of industrial production are highlighted, and in the digest IIA-2014 such category explicitly is not provided. It was managed to compare only the two exponents, characterizing an innovative activity of organizations, but according to them the actual values are far away from the level planed for year 2013. The most essential backlog is discovered for organizations in the field of communications, computation equipment and informational technologies. Since 2005 the share of organizations, which are realizing the technological innovations, almost annually was decreasing (from 15, 3 % in 2005 to 10, 3 % in 20124) at the target goal in 2013 on level 22, 1 %.

There huge differentiation and instability in indexes dynamics in profiles of branches (see Table-2) are detected. Low values per separated indexes among the branches of high technologies have:

- The production of office inventory and computing equipment;
- The production of equipment for radio, television and communications;
- On the contrary, the high values per separate indexes have:

- among semi technology branches of high level - the chemical production and production of cars, trailers and semi-trailers;
- among semi technology branches of low level - the production of coke, oil products and metallurgical production.

In the part of indexes the high-technology industries yield semi technological branches of high level. To such indexes relate:

- the share of innovative goods in total amount of shipped production;
- the volume of goods export in absolute expression;
- the volume of innovative goods export in absolute expression.

It is possible to draw the conclusion on low productivity of innovative activity in hi-tech group of branches in comparison with semi technological branches of high level.

The gained conclusion on level of Russia can mean that the high-technology industries distinguished in statistical digest still do not play an essential role in economy. In total exports of Russia their share has grown from 0, 15 % in 2007 to 0, 6 % in 2012, and nearly three quarters of export is the share of aircrafts production. Moreover, it is possible to declare a low economic efficiency of innovative activity in high-technology industries. They are in the lead on intensity of innovation expenditures, but yield to semi technological branches of high level on shares of innovative goods in total amount of shipped production.

At generalization of indexes on all sum-total of inspected kinds of economic activity, it is possible to draw a similar conclusion on insufficiently effective as a whole innovative activity in Russia.

Graphically the drawn conclusion is confirmed by dot diagram (Figure-2) on which the outcomes of international comparisons of Russia and European countries are provided on two criterions:

- on share of anew implanted or to being exposed to significant technological modifications of innovative goods, operations, services new to the market (in percentage of total amount of shipped goods, fulfilled operations, services);
- intensity of expenditures on technological innovations (specific weight of expenditures on technological innovations in total amount of shipped goods, fulfilled operations, services)

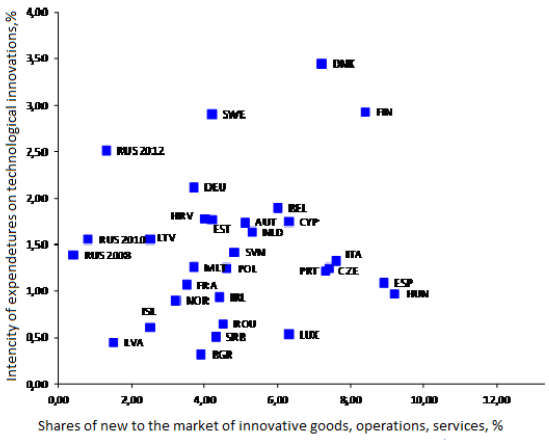

Figure-2. Efficacy of innovative activity in countries of Europe, 2012.

Data source IIA-2014 (pages 449-454), authors reckoning.

If on intensity of expenditures on technological innovations Russia in 2012 has anticipated Germany, having come nearer to leaders on expenditures - to the Scandinavian countries (to Sweden, Finland, Denmark), on lobe of the innovative goods new to the market, operations, services takes the last position (1, 3 %). The nearest value on share of new goods at Latvia (1, 5 %) at more than in 5 times less expenditures intensity on technological innovations (0, 45 % at Latvia; 2,52 % at Russia).

In scaled examination of 118 countries of the world (Connolly, 2013) on data for years 2008-2010 it is found inconvertible correlation (at level 0, 76) between per capita income and summary index of effectiveness of high technologies (the summary index of high-technology performance). The author estimates more outstanding performance of high technologies at Russia than it was possible to predict on income level. In one group with Russia the countries of Europe are attributed: Latvia, Lithuania, Croatia; Latin America: Brazil, Mexico and also some of Asian "tigers": Thailand, Philippines, Malaysia and China.

(c) Definition of factors and inconsistencies of innovative development of high-technology industries of economy of Russia.

The conclusions made earlier (item 2), show that the analyzed statistical data do not allow detecting and estimating uniquely the potential of innovative development of high-technology industries of economy of Russia. Realized in statistical digest distinguishing of the branches of high technologies is mapping rather the past tendency of economic development but not the future ones. As such branches are excreted the branches of fourth and fifth economic structure instead of sixth. Data on export of high technologies branches shows (see Table-2) that they cannot replace soon or essentially extent the volumes of export of traditional branches owing to political, economical, technological and other causes (Spitsin, 2010; Kozin, 2012).

In particular, at completion of the form of federal statistical observation "Innovation" the inspected organizations have possibility to estimate the factors in most degree preventing the technological innovations. The generalized outcomes (Figure-3) on summary rating of all factors allow drawing the conclusion that the economical factors prevent the innovations in most degree (summary rating 19, 2; share in the chart - 43 %):

- a lack of organization owned funds;
- poor financial support from the state;
- high economic hazard and cost of innovations.

It is important to notice that the second group in the chart is the "informational" factors on cumulative share (rating 11, 3; share 26 %). In our investigation to them are attributed: a lack of information on new technologies and sales markets, backwardness of cooperation communications and also indeterminacy of economic benefit from use of intellectual property. It represents, that just in the given group of factors is hidden the greatest potential of innovative development at the expense of introduction and wider use of up-to-date informational technologies. And as well the conclusion made up earlier about poor innovative activity of the Russian IT organizations should be taken into consideration.

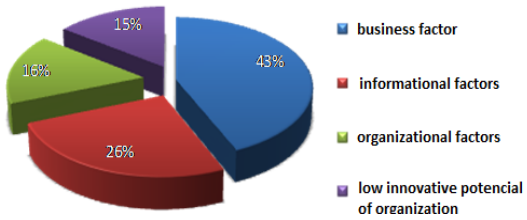

Figure-3. Rating of factors preventing the technological innovations.

Data source - IIA-2014 (pages 449-454), calculations of authors.

In group called "organizational" (summary rating 7, 2; share 16 %) the “external" factors concerning the organization have been excreted:

- lack of datum of legislative and normative - legal documents
- governing and boosting an innovative activity;
- backwardness of innovative infrastructure (intermediate,
- informational, legal, banking and other services).
- the specified factors have been called "external" because the organizations have no essential possibility to decrease'em on their own. It is a level of public administration and governing the innovative development.

To final group of factors of the chart (rating 6, 5; share 15 %) it is referred beside the similar "low innovative potential of organization" the deficiency factor of qualified personnel. In more detail the indexes of innovative potential are considered in (Vaganov by *et al*, 2011; Borisoglebsky and Mats, 2011)

Orientation on creating of import-substituting productions and assimilation in domestic Russian market can become the rational method of solving the group of economic problems. The suggested in (Spitsyn, 2010) development mechanism means the adoption of foreign technologies, including by force of creation the joint ventures, the invention in Russia of R and D-centers (research and development) of large transnational corporations. The successful examples are the Russian divisions of Boing, Samsung, Cisco, TMK, etc. (in more detailed, refer SkReview, 2013). Then the technologically exfoliating countries gain an advantage - in forming the reproduction contour they can be guided by already accumulated investment-technological experience of developed countries, increasing the effectiveness of created technological chains. And in this case the leading role will belong to qualitative information support (in the form of know-how, technological documentation, "code of best practices", etc.).

The effective complex solution of the problem of information support is widely used in the world ISP-technologies[1].

Singularities of ISP-technologies are (Norenkov and Kuzmik, 2002):

- solving the integration problems of all processes in life cycle process (unlike computer automation and integration of separate processes);
- the framework of solved problems oversteps the boundaries of separate enterprise;
- the participants of informational interaction can be territorially remote from each other and located in different cities and countries;
- shared information is very heterogeneous: these are marketing, design-technology, production data, commercial and legal information, etc. For possibility of its sharing the means and technologies of representation and incorrect interpreting of data shall be standardized;
- the basic communication medium is the global Internet web.
- the common information zone provides the possibility of interaction of projecting organizations, manufacturing enterprises, suppliers, organizations of service and end user at all stages of life cycle;
- the shared storage of designer data on product allows to several projecting organizations to adjust the process of cooperative projection. Data on product design is used for technological preparation of production, planning of needs for material resources, purchases, production planning, processes of manufacture, tests, sales, support of operational processes, etc.
- at each stage of life cycle its own data set is created to be used at the subsequent stages.

Introduction of ISP-technology in corpore allows increasing by 25-30 % the production efficiency of science-intensive production at simultaneous substantial increase of its quality, including decumulation (Vasyutovich *et al*., 2001) in:

- planning time - up to 70 %;
- projection time - up to 50 %;
- expenditures on assessment of projects feasibility - up to 15-40 %;
- manufacturing costs up to 15-60 %;
- costs of technical documentation up to 10-50 %;
- time of operational support planning - up to 70 %;
- information costs - up to 15-60 %;
- amounts of errors at data transmission - up to 90 %.

ISP - the directed approach is already implanted in many countries. So, in USA the ISP - technologies are completely taken into arsenal by the Ministry of Defense of the USA on which orders the development and output of military production and technique (aerospace and Terraneous technique, sea crafts of different functions) are carried out. Besides, the ISP - technologies start being used and implant actively civil enterprises (first of all for building of science-intensive production in the same fields) (the Vessels *et al*., 2006; Russian encyclopedia CALS, 2008)

Federal executive bodies of Russia (The Ministry of Industry Science, the Ministry of Industry Energy, nowadays - Ministry of Industry Trade of the Russian Federation) is undertaken the series of standard measures on guidance and standard control of development in ISP-technologies field. In year 2001 the "Concept of development of CALS technologies in Russia" has been passed. In year 2003 - the "Concept of integrated logistics' support". In year 2009 - the methodical references such as "Electronic catalogs and enumerations for exported military products. Structure, format of representation and data communication order". In year 2013 - the "Concept of ISP-technologies development for military products delivered for export". The concept is developed in response to comprehensive plan of measures directed on effectiveness increase of after sales service of Russian military activities products delivered for export.

According to Research Scientific Center "Applied logistics" some separate elements of ISP-technologies are successfully implanted on VAZ, "Sukhoi" Aviation Military Industrial Complex, MAPO "MiG", JSC "Tupolev", MMPP "Salute" and some other enterprises and complexes.

However in everywhere across Russia the introduction of ISP-technologies regarding to up-to-date world level is at the initial stage and descends with no

complex study of problem on national basis (Research Scientific Center “Applied logistics”, 2014).

From our point of view it would be required the wider involvement into the process of scientific society not just of staff of research divisions organizations and expert institutes of the Ministries, but as well of leading scientific higher education institutions. Besides, in higher education institutions the professional training of shots is concentrated.

For the last years the cooperation structure of organizations which are realizing innovative activity with higher education institutions has already essentially varied. In Figure-4 the charts are provided reflecting the dynamics of partnership shares with universities of organizations, realizing the technological innovations. It is possible to draw the conclusion on steady decrease of the share of one-time, informal cooperation with universities and on growth of permanent cooperation. The development of permanent partnership of universities with organizations is most expressed in area of communications, computer engineering and informational technologies.

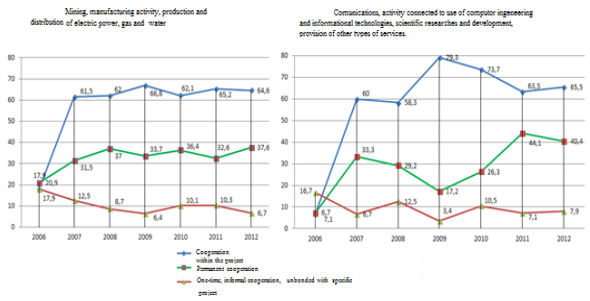

Figure-4. Share modification of technological partnership with universities at performance of investigations and development of organizations which were realizing technological innovations, % from total number of the organizations which had the joint projects.

Data sources IIA-2008 (pages 188-189), IIA-2010 (pages 216-219), IIA-2012 (pages 228-231), IIA-2014 (pages 226-229), and calculations of authors.

In this regard the effective in significant degree represents the model of innovative development Henry Etzkowitz called by the author “Triad spiral” (Itskovits G., 2010; Gorlenko and Miroshnikov, 2012). This model provides an effective interaction of three basic components of innovative activity: the universities - the enterprises - the state. Thus affirms that in up-to-date society the very university should be a core of innovative activity. Justification of priority of institutional component in innovative process which directly conflicts with controlling vertical is a specific feature of the given model application to the practice of Russian economic policy. Verticalization of economy of Russia is a fundamental brake on innovative development. The model of triad spiral opposes to vertical mechanisms, controlling an innovative development, the establishment and perfection of horizontal connections between operating elements (the universities, the industrial clusters, the state institutes of control).

Within the set problem the specific positive step of the government of Russian Federation is the adoption of resolution No. 218 "About standards of the state support on development of cooperation of Russian higher educational institutions and organizations implementing the complex projects on creation the hi-tech production" (The resolution of the government of Russia of 4/9/2010, No. 218). The target of the state support is the development of cooperation of Russian higher educational institutions and manufacturing enterprises, development of scientific and educational activity in Russian higher education institutions, incitement to use by manufacturing enterprises the potential of Russian higher educational institutions for development of the science-intensive production and stimulation an innovative activity in Russian economy. The pattern of successful interaction within the given Resolution is the joint implementation of the project "Creation of hi-tech production on manufacturing the portable multipurpose hardware-software complex of long-term cardio monitoring and ergometry" JSC RPE SI "Kvant" and the Southern Federal University. The Resolution has provided a possibility of subsidies granting to manufacturing enterprises on term from 1 up to 3 years in amount of financing up to 100 million rubles a year for financing of complex projects of hi-tech production organization, fulfilled together with manufacturing enterprises and higher educational institutions. The subsidy is granted to manufacturing enterprise allows to guarantee the demand in higher educational institution elaboration and its further use for organization of new hi-tech production.

4. INFERENCE

Thus, in process of this investigation the authors have come to the following basic conclusions connected to development of innovative potential of high-technology branches of Russian industry in the conditions of globalization.

In the first place, an absence of reliable and complete datum of the statistics, allowing the estimation the state of development of high-technology branches of the Industry inhibits the possibilities of carrying out the research activities in the given sphere of economic science. Thereat an absence of uniform system concept to shaping of these data base of activities involves the problem of incompatibility and incomparability of data available in open access with target indexes of Strategy of innovative development of the Russian Federation for the season till year 2020. As one of the ways to outdo this problem within this research it has been supposed the pattern of structuring of innovative activity kinds in correspondence with innovation "life cycle".

Secondly, the analysis of indexes of innovative activity of Russia carried out in research and comparison of effectiveness level of innovative activity in Russia and

countries of Europe has found the series of singularities of development of high-technology industries in the Russian Federation. It is necessary to such singularities, to attribute, first of all, the strong differentiation and instability of dynamics in indexes within the bounds of branches, the low productivity of innovative activity in hi-tech group of branches and the insufficient effective as a whole innovative activity in Russia.

Thirdly, among the factors exercising an influence on development of technological innovations the group of "informational" factors represents the most flexible and perspective from the point of view of development of innovative activity potential. As one of the examples of "informational" factors development it is highlighted the solution of problem of information support with use of ISP-technology.

At higher level of comprehension of systemacity and multi factorialness of development of innovative potential of Russian hi-tech industry the efficient is the model of innovative development of Henry Etzkowitz, so-called “Triad spiral” of interactions: the universities - the enterprises - the state. Thereat the university should become a core of innovative activity. The comprehension of methodology of innovative development and forming the complex state policy directed on development of innovative infrastructure in all territory of the country should become the key factor of successful and effective growth of innovative potential of hi-tech sector of the Industry. Development of cooperation of Russian higher educational institutions and manufacturing enterprises, the development of scientific and educational activity in the Russian higher education institutions, stimulation of employment by manufacturing enterprises of Russian higher educational institutions potential for development of science-intensive production and inducing of innovative activity in Russian economy should be provided by means of standards of the state support. The positive step in this direction is an acceptance of Resolution No. 218 by the government of the Russian Federation "About standards of the state support of development of cooperation of Russian higher educational institutions and organizations implementing the complex projects on creation of hi-tech manufacturing".

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