BIOSCIENCES BIOTECHNOLOGY RESEARCH ASIA, April 2015. Vol. **12**(1), 789-799

Innovative Development of Companies as a Basis of Innovation Systems of Russia

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DOI: http://dx.doi.org/10.13005/bbra/1724

(Received: 30 November 2014; accepted: 17 January 2015)

The article discussed the status of the innovation system of the Russian Federation. It is concluded that the resources of the state influence on innovative growth have been exhausted. This means that the accelerated translation of the economy to the innovative development is impossible without the participation of each company. Identified the cause-effect relationship between factors of innovative development company. The methodical approach to estimation of innovative potential as the basis for the development of innovative enterprises.

Key words: Innovative system, Innovative development, The innovative potential, Factors innovative capacity, Model estimation of innovative potential.

In the traditional economy, innovation is defined as an object that is embedded in production as a result of scientific research or of the discovery, is qualitatively different from the previous analogue.

In the economic literature as "innovation" is interpreted as the transformation of potential scientific and technological progress in the real, is embodied in new products and technologies. In Russia, the term "innovation" has been actively used both independently and to refer to a number of related concepts: "innovation", "innovative process", "innovative solution", etc.

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According to the well-known Norwegian economist K. Holt, expert on governance, by the early 80s, there were more than a hundred definitions of innovation (Salimyanova, 2011).

Let's consider some, I. Schumpeter tried to find the essence of innovative entrepreneurship in the framework of the production function. "The production function describes the amount of change of the product, taking into account changes in the totality of factors affecting it. If the sum of the factors we will change the shape of the functions, we obtain the innovation" (Shumpeter, 1982).

Brian Twiss defines innovation as a process in which an invention or idea becomes the economic substance over the commercial use of "invention becomes an innovation when it receives

a success in the market" (Twiss, 1974).

Some authors, such as P. Drucker (Drucker, 1970) devide the processes of scientific and technological changes on the scientific discoveries, inventions and innovations. It is believed that scientific discovery can always be measured so that it adds to the understanding of the nature phenomena. The invention is in turn determined by the new technical possibilities of solving specific problems. A main feature of the innovation lies in its impact on the way people live.

Other researchers saw an understanding of innovation characteristic in the same way. The innovation, by E. von Hippel (Hippel, 1980), is the first application of a new product or process. The invention, by X. Riggs (Riggs, 1983), is a "conceptualization of new ideas", and innovation - the commercial development of new ideas. B. Kingston (Kingston, 1984) implies something more innovation. Innovation is seen as a process with many stages and links from the opening and ending with the introduction of new products, a process that leads to more efficient production and ending with new and substantially modified products or services. C. Mendell and D. Ennis, understand the process of innovation is not scientific and technological change, and the result, when the term "innovation" is used to refer to a really new and unique products, processes or services (Mendell & Ennis, 1985). By X. Barnett (Barnett, 1953) and Zaltman (Zaltman, 1973) innovation is any idea, activity or a real result, which is recognized for its new qualitative differences from existing forms, or are perceived as new by the body which implement them.

We could continue to explore and different interpretations of the term "innovation", but, in our opinion, the above definitions are enough to make a logical conclusion - innovations are created in the course of business, and the main driver of innovation should be a market outcome that depends on a number of factors, both internal to the enterprise, and external, and that determined the content of this article.

METHODS

Justification of the problem

In an increasingly competitive market, in which the company operates conventional, the main factor of competitiveness, maintain and improve the financial condition becomes innovation (Doroshenko, Somina *et al*., 2013).

Businesses is imperative to carry out research and development in order to diversify production, modernization, creating high technology and modern production potential, as established during the Soviet era has exhausted its possibilities.

Under the influence of increasing domestic and foreign competition and innovation are the most important element of marketing in the company. New ideas and products, advanced technologies and organizational solutions are increasingly determine the success of business, ensure the survival of enterprises and financial stability.

And even in the good years before the crisis there was an understanding that economic growth was transitory factors and the need to take steps in the direction of Russia's transition to sustainable growth based on investment and innovation.

The beginning of the end of 2008 in the global financial and economic crisis has only increased the importance of resolving this issue and raised the question not only on the development of innovation, but also about the role of the state in this process, that is, the development of the innovation system as a whole.

Researching the problem of the development of innovation systems

Problems of development of innovative system devoted many scientific publications. So, Abramova M.I. proposed a model of perspective Russian innovation system, shown in Figure 1.

Obviously, the key in this model should be the answer to the question about the role of the state in the efficiency of the innovation system. And this answer is ambiguous.

According to Abramova M.I. the state's role in the development of the innovation system is significant, but it should be borne in mind that excessive regulation attempts innovation on the part of the government can lead to inefficiencies funded programs, to reduce the interest of the industrial sector in the implementation of innovations (Abramova, 2011).

On the other hand, there are other points of view. Among them, for example, the assertion that an effective innovation systems in a stagnant

economy can only be built under strict administrative control. As the main argument often provides examples of effective modernization of the economies of various countries, for example, in the Soviet Union and Germany in the 30s of the last century.

As shown in Figure 1, all the elements of the innovation system must exist in some innovative market environment. This means that for the creation, production and dissemination of innovation requires not only the development of science and production, the ability to perceive its achievements, and its consumer products, but also incentives for people to create and innovate in action, funding, favorable social conditions and orientation on scientific and technological progress. The company creates innovative system in case if this orientation is positive (Abramova, 2011).

Evaluation of the current state of the Russian innovation system

For researching the current state of the innovation system of the Russian Federation we will use indicators…For this we use an indicator of the level of national R & D expenditure as a percentage of gross domestic product (see Table 1), as the most popular indicators of innovation economy.

As we can notice, Russia in this ranking has not the worst position (32th). However, there is a difference between the costs of R& D between Russia and the leaders in the rating and it does not give grounds for excessive optimism.

Obviously, to say only on the costs of R & D on the state of innovation systems are completely incorrect. Because in the economy is quite possible that the research cannot be carried out at all but innovation is possible. Or vice versa, when they spent a huge, including the state, resources on R & D and innovation will not, because of the unwillingness of subjects to perceive their markets.

Much more useful in this case is the index of innovativeness of the economy, which is calculated as a weighted sum of the scores of the two groups of indicators: Available resources and conditions for innovation (Innovation Input).

Achieved practical innovation results (Innovation Output)

Thus, the Index is the ratio of cost and effect, which makes it much more objective and to evaluate the effectiveness of efforts to promote innovation in a given country (see Table 2).

The data of the index has not encouraging. Russia in the current 2013 ranked 62 in the overall ranking and it is between Jordan and Mexico. Need to note that in comparison with the previous year, our country has lost 11 positions from (The Global Innovation Index, 2013), and if this trend will continue, then we will soon find ourselves at the bottom of the rankings.

Extremely low index of innovation indicates a low efficiency and means that at the moment, as to the government and to all entrepreneurs is formidable: not only ensure rapid growth of innovation, but also improve the efficiency of this process at all levels - from government programs to the level of each company, that is in all parts of the innovation system as a whole.

RESULTS

Implementation of the state innovation policy

As we already noted, the effectiveness of the innovation system is determined, on the one hand, the level of research and innovation activities in enterprises. In turn, the innovative activity of enterprises and other economic agents is determined by the institutional environment, the formation of which is the prerogative of the state (Kondrashova *et al*., 2013). Therefore, we turn first to the state policy in the field of innovation.

Melnikov V.V. (Melnikov, 2012) formulated the main challenges for the government to ensure the effectiveness of the national innovation system, they are listed in Table 3.

We may see how active over the past 20 state sought to realize these objectives at the Figure 2.

It is clear that in recent years the political leadership of the country has made innovation a national priority and specific initiatives prove that it is not just words. Adopted a strategy of innovative development, implementing large-scale government programs. However, to convert the country's economy on the path of innovative development is not enough simply to increase direct public investments in science and innovation (the experience of "Skolkovo" is clearly confirms). Moreover, in our opinion, the resource state sphere

to stimulate innovation is almost exhausted, and requires the involvement of enterprises in the process of innovation.

OECD data is confirmed (Report of the Organization of Economic Cooperation and Development, 2011) that today in Russia there is a sharp contradiction between the progressive territorial, scientific, technological and industrial

Table 1. Ranks countries in terms of R & D expenditure

Position	Country	Expenditure (%) of GDP
1	Israel	4.40
2	Finland	3.88
3	South Korea	3.74
4	Sweden	3.40
5	Japan	3.36
6	Denmark	3.06
7	Switzerland	2.99
8	United Sates of America	2.90
9	Germany	2.82
10	Austria	2.75
	…	
30	Brazil	1.16
31	Hungary	1.16
32	Russia	1.16
33	Tunisia	1.10
34	Soth Africa	0.93
35	Serbia	0.92
	…	
88	Trinidad and Tobago	0.05
89	Lesotho	0.03
90	Bosnia and Herzegovina	0.02

Sourse: (UNESCO Institute for Statistics, 2012)

Table 2. Ranks of the countries on the index of innovation 2013

Ranking	Country	Index
1	Switzerland	66.6
2	Sweden	61.4
3	Great Britain	61.2
4	Netherlands	61.1
5	United States of America	60.3
6	Finland	59.5
7	Hong Kong	59.4
8	Singapore	59.4
9	Denmark	58.3
10	Ireland	57.9
35	China	44.7
59	Armenia	37.6
60	Columbia	37.4
61	Jordan	37.3
62	Russia	37.2
63	Mexico	36.8
64	Brazil	36.3
65	Bosnia and Herzegovina	36.2
66	India	36.2
88	Salvador	31.3
89	Uganda	31.2
90	Philippines	31.2

Source: (The Global Innovation Index, 2013)

Table 1. Challenges of state policy for the development national innovation system

Innovation policy	Science and Technology Policy	The challenges for building the institutional environment
1) Provision of private sector interest in financing innovation;	1)Development of fundamental science, the most important applied research and development;	1) Reducing transaction costs of bureaucratic process;
2) Identification of areas of economic development of the country;	2)Determination of the directions of development of the technological advantages of the country;	2) increasing specification of property rights in the field of R & D and innovation;
3) Increasing efficient use of the results of scientific and technical activities;	3)preservation and development of human resources and technology complex;	3) create a favorable investment climate;
4) Increasing the competitiveness of national products in the world markets;	4) integration of science and education;	4) political stability and economic freedom;
5) modernization of the economy due to the transition to the innovations;	5) development of international scientific and technical cooperation;	5) measures to fight poverty;
6) consolidation the country's defense;	6) development of inter-university co-operation within the country;	6) reduction of income differences;
7) increasing environmental safety, etc..	7) encouraging co-operation of business and science, etc.	7) creating and maintaining the desired level of competition in the markets, etc.

centers and fairly pain-shim stagnating number of enterprises and organizations with very low productivity and low levels of innovation activity.

Effective innovation management at the firm level

Of course simple solution to this problem does not exist but it is clear that the reorientation towards innovation is needed in the business sector. And this understanding at the level of heads of enterprises is becoming more pronounced (Taburchak *et al*., 2013).

So, by PricewaterhouseCoopers (PwC) were surveyed 246 executives from 60 countries in North and South America, Europe, Asia-Pacific and the Middle East. The study was a continuation of Pulse Survey conducted by PwC in 2009, a survey of managers of the largest companies in the world, which was attended by 1,330 people. The results of this survey found that the innovative component of business for a long time is the focus of corporate executives: 97% of respondents consider innovation a priority of business (Investigation of PricewaterhouseCoopers, 2013).

In this case, over the next three years, company executives plan to implement innovative solutions everywhere: in customer service in offering products and services, business models, systems and approaches(Investigation of PricewaterhouseCoopers, 2013) .

With such huge plans of such a large number of companies raises the question: what should be done to the enterprise to stand out from the number of competitors and gain a unique competitive advantage.

Question can be found in the foundations of a market economy. To sell your items the seller has interest in him as a potential consumer. Show that it is superior to others. For this product must meet certain requirements better than the others. Other options to open new consumer needs, the existence of which he may be, do not even guess.

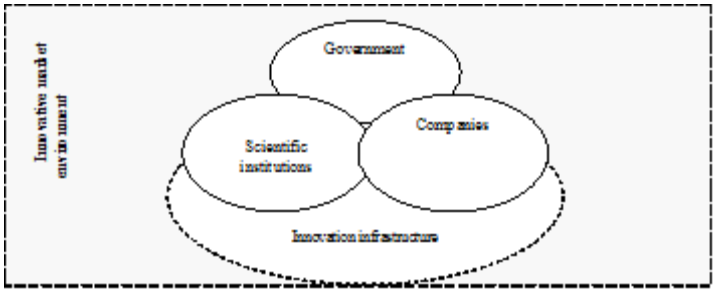
This means that, first you need to create innovation. Then it is necessary to materialize in goods and services. Well, if it can make himself an innovator, that is not always. If the innovator is itself not capable, he needed an investor, which also need to be interested and to convince to provide the necessary financial resources. But that's not all. No less important in terms of achieving the end result task - to be able to present it to the market that is able to explain the advantages of innovation in comparison with the existing products on the market, or those that may occur in the near future. And all of these skills or abilities should be present in the enterprise sector.

In our point of view, proper coordination of these processes - from the creation of innovation before submitting it to the market depends on the ability of managers to organizations and the resources that management has - human resources, natural resources, and so on, as shown in Figure 3.

Thus, it becomes evident that the development of innovative enterprises is ensured through effective management, aimed at the development of its innovative potential of the company, the intensification of efforts to

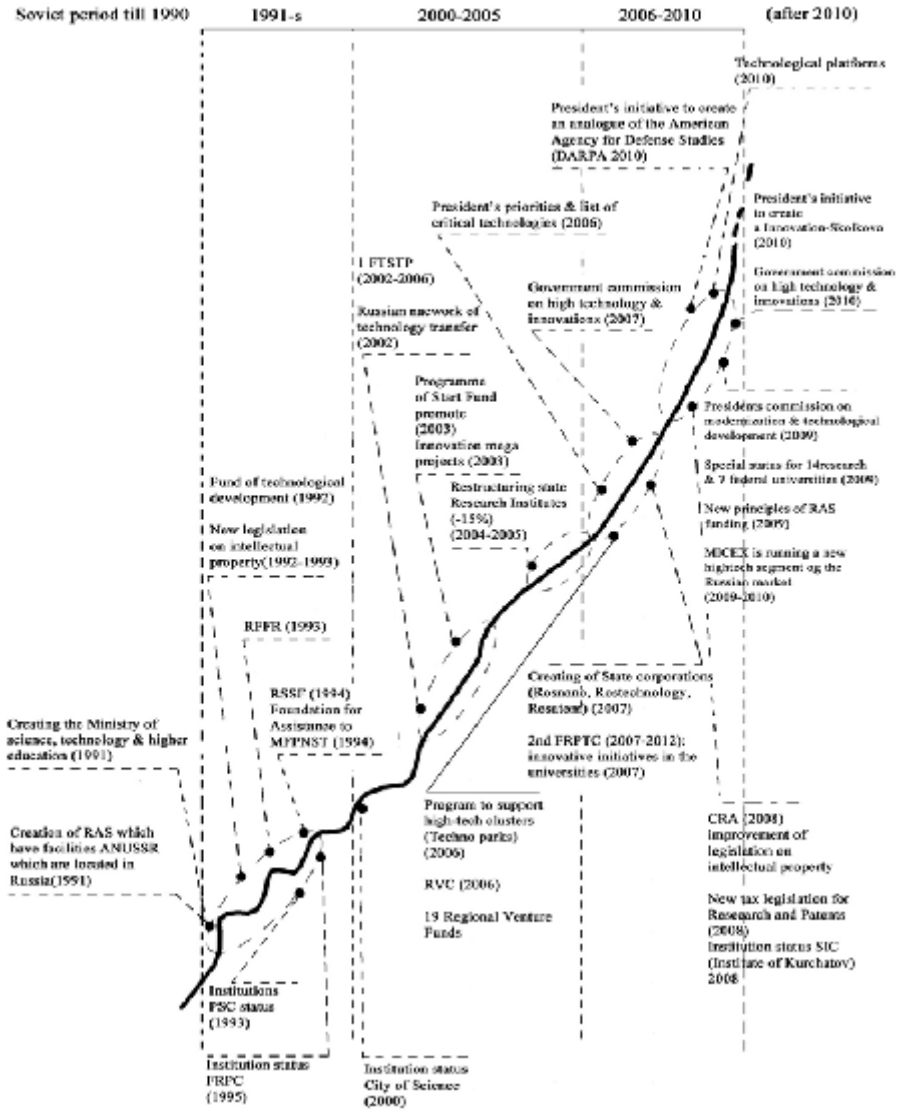
Table 4. Factors which are forming innovative capacity

Marketing	Production	Human recourse
1. Patents, trademarks and similar legal forms of protection. 2 Effective pricing. 3 Advertising policy. 4 Assortment policy. 5 Trading Policy. 6 Sales Policy. 7 Continuous research of customers and markets. 8 Ongoing work to create a positive image of the company. 9 Targeted work on establishing customer feedback.	1. Flexible manufacturing process. 2 Optimal structure of BPA. 3 Resource-saving technologies. 4 Availability and effectiveness of the quality management system.. 5 speed the introduction of new products. 6 Independent research and development. 7 The presence of experimental production. 8 A system of collecting and processing information about the quality of products. 9 The presence of a well-equipped metrological service.	1. Qualification structure of employees. 2 The presence of an effective system of moral and material incentives. 3 A system of training and staff development. 4 Organizational climate, the internal culture of the organization. 5 Staff loyalty and low staff turnover.



Source: (Abramova, 2011)

Fig. 1. Model of an effective innovation system of Russia



Source: (Report of the Organization of Economic Cooperation and Development, 2011)

Fig. 2. Innovation Policy in Russia: institutional reforms

commercialize innovations, and the optimization of production processes to ensure the production and sale of innovative products and services at minimum cost.

The three-levels model of the innovation potential in the enterprise

Let's specify what is meant by individual abilities, forming the potential for innovation.

Under the ability to innovate and provide quality goods and services, we understand the presence of the enterprise environment that provided their effective use will ensure a continuous production process innovation. This ability to create innovation, the ability to commercialize the innovation, and the ability to reduce costs. The ability to create innovation, in turn, depends on the conditions of production and staffing conditions listed in Table 4.

Under the same ability to commercialize innovation at the enterprise level, we understand the process of removing the possibility of organizing innovative products to market.

In general, this process can be represented as follows. In the first stage, if the company is developing several innovative products, there is evaluation and selection of those that are most suitable for injection into the market. The most important criteria are: the potential of an innovative product, the demand for this product in the society, the demand for the product in a particular market segment, the potential cost-effectiveness of the implementation of the product.

If the company has attracted investors for the purpose of creating an innovative product, the second phase should clearly specify the rights created by innovation among all stakeholders.

Only then possible to start the process of organizing the production of innovation or its implementation in existing manufacturing process with its further refinement if necessary, and begin marketing efforts to promote products on the market. This means that in addition to the above conditions in relation to the manufacturing process and personnel at the plant there must be a condition for efficient marketing of products as shown in Table 4.

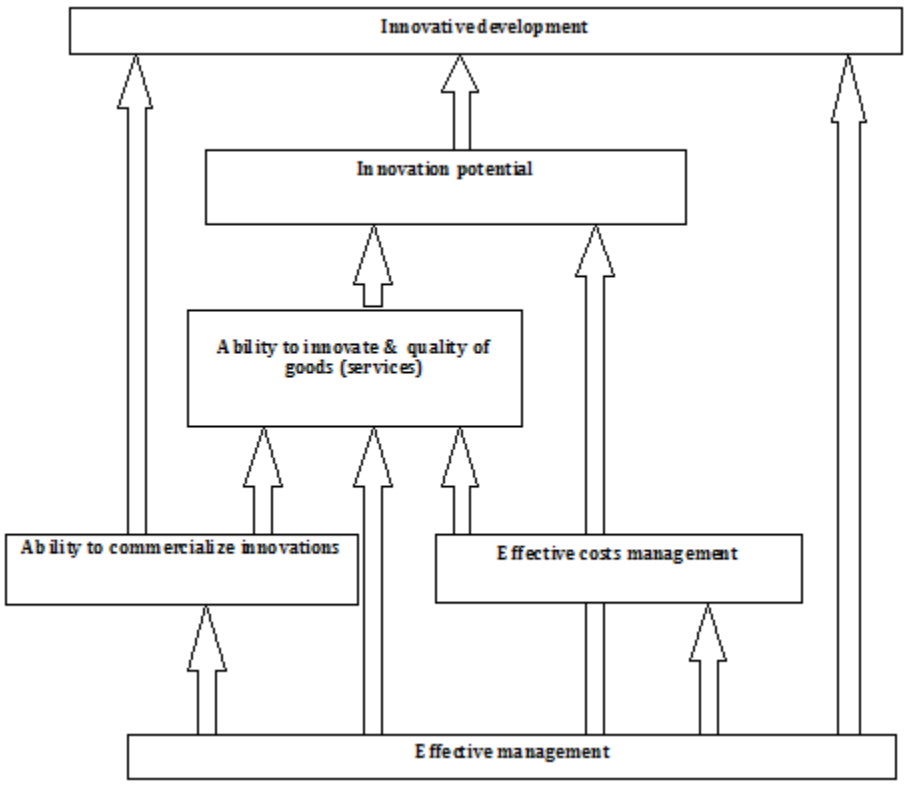


Fig. 3. The process of providing of innovative development of the company

Innovative potential of the company is not limited by these factors and to a deeper study of the conditions of each particular company, this list may be supplemented by others (Doroshenko, Taburchak *et al*., 2013). So, the list may also be supplemented by individual factors that characterize the financial capabilities of the company.

Since the most important factor that allows you to transfer the company to an innovative way of development is the potential for innovation, then concentrate our attention on its development. Shown in Figure 3, the causal relationships between the factors of innovative capacity enable us to building a methodological approaches that could be used in the management of enterprises in their practice to assess the current and desired state of innovation in the implementation of programs of innovative development of the enterprise.

The most convenient for us seems qualimetrical approach, which involves the initial construction of a hierarchical model of the properties of the system, although other. Figure 4 shows our proposed three-tier model of factors of innovation potential.

Methodical approach to the quantification of the innovative capacity

Such a representation of the factors of innovation potential allows us to build a comprehensive indicator for features such as innovation in general, and basic skills of the enterprise affecting innovation potential.

The practical use of this hierarchical model assumes implementation of the following steps:

The first step is to identify the most important factors of innovative capacity for each level of the hierarchical model.

The second step is to develop a rating scale and justify the weighting coefficients for each of the levels.

After the third stage of a quantitative evaluation of certain factors in the first stage.

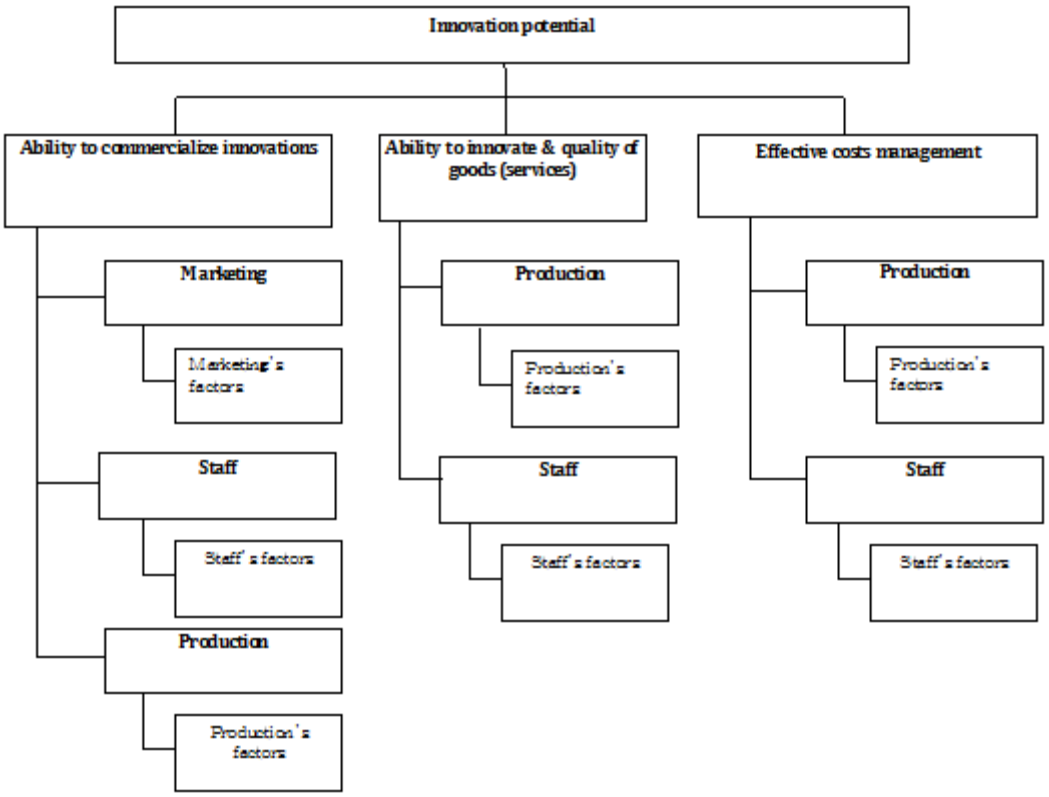


Fig. 4. The hierarchical representation of the factors which are forming the innovative capacity

Finally, on the fourth complex index calculated on the basis of the innovative capacity of a weighted average. At the same time, in our opinion, the most objective evaluation will be obtained by using a weighted average of the geometric:

$$IP = \prod_{i=1}^{n} C_{P_i} \times B_i \quad \text{... (1)}$$

here Cp_i – quantification of the i-th power; B_i – the weight of the i-th ability.

Also quantification capabilities can also be evaluated similarly, but based on the quantitative assessment of the factors forming these abilities. In the same way can be obtained and quantification of factors abilities.

The resulting estimates can be both management of the enterprise as a whole, as well as line managers responsible for the development of individual abilities forming innovative potential, which makes our proposed model is the foundation upon which can be built a harmonious system of managing the innovation potential of the enterprise.

Note that this model can be used not only to evaluate the situation. If the criteria to use the desired quantitative estimates, it may be obtained by quantifying target innovative capacity, which may be the basis for the planning of innovative development of the company in the future.

In one of our earlier published work has been proposed similar to the above model of the evaluation of competitiveness and, based on the pre-selection mechanism is false competitive strategies (ondrashov0 & Cheng, 2013). In our

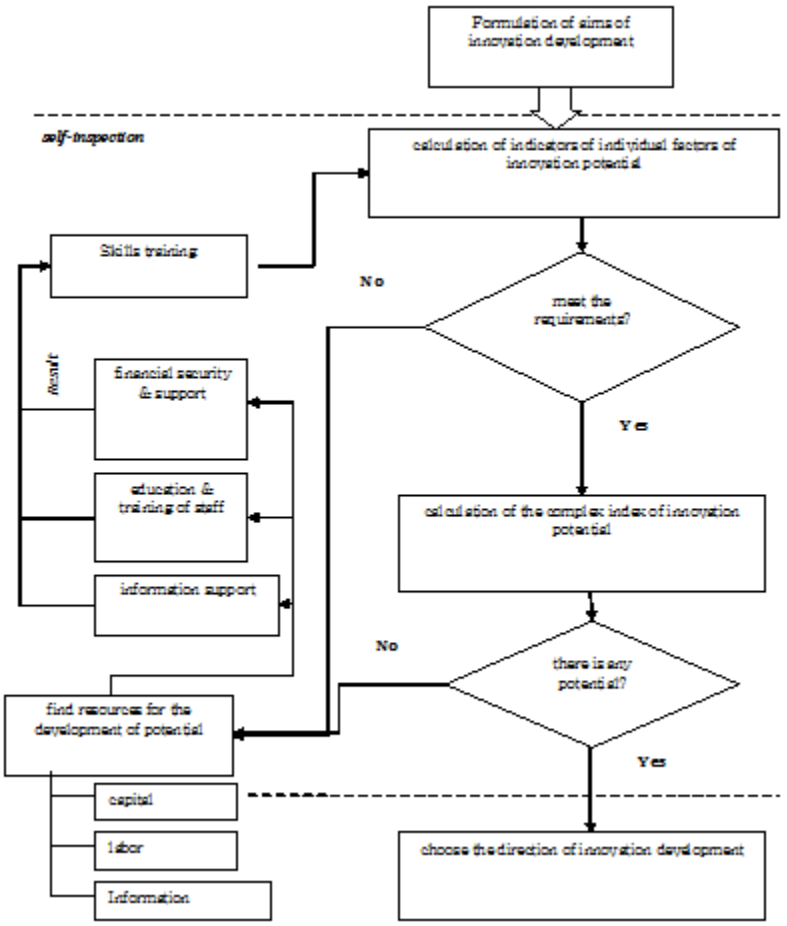


Fig. 5. Selecting the directions of innovative development based on an assessment of innovation potential

opinion, the management of the development of innovative capacity is may well be considered an analogue of strategic planning, and therefore it can be represented as shown in Figure 5.

DISCUSSION

The way which was proposed to the development of innovative enterprises is not exhaustive, but it certainly can give the management of domestic enterprises specific guidelines that can serve as a starting point to develop their own approaches to innovative development.

In conclusion, we would like to quote David Percival, head of international practice PricewaterhouseCoopers in developing of innovative products: "In simple terms, the vast majority of managers recognize that in today's environment, companies must innovate to survive. No middle ground. Surveyed executives are ready to tackle this challenge and take the helm ... Time will show whether their companies are ready to implement these plans into practice (ondrashov0 & Cheng, 2013).

CONCLUSION

This article discusses the current state of the Russian innovation system. According to the analysis concluded that the state for the past 20 years, considerable efforts have been aimed at the stimulation of innovation in the economy.

As a result, the economy emerged dissonance between the large-scale public projects for the development of innovation and not less than the magnitude of the passivity of the business sector. This contradiction could not help but reflect on the situation in Russia at the international level - the index of innovation, we moved down to 62 in the world.

The article we made a conclusion that without translation to innovative development of the majority of domestic enterprises is impossible and innovative development of the Russian economy as well.

As a methodological approach that could help management of domestic enterprises in the organization of innovative development, a model of formation of innovative capacity, taking into account various factors.

ACKNOWLEDGEMENTS

The article was published with the financial support from Ministry of Education and Science of the Russian Federation within the framework of state assignment to the project #26.1511.2014K "Theory and methodology of managing innovational and investment processes in small business enterprises."

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