

Significance of technological innovations for an increase of competitiveness of industrial companies

Elena Danilina¹ and Zhanna Mingaleva²

¹ Moscow State University of Instrument Engineering and Computer Science, Letnaya str., 38-1-92, Mytishchi, 141021, Moscow region, Russia

² Perm National Research Polytechnic University, Komsomolsky Av. 29, Perm, 614000, Russia

Abstract. In this paper the author discusses about a role and a significance of technological innovations for a competitive power of Russian industrial companies. In order to do this, the conception of new technological solutions (technological innovations) was used in the research relatively to an industrial company in context of its role and significance in a support of a competitive strength of a company, which becomes apparent acutely in the world's market conditions. The author underlines the importance of a research and development (R&D) and innovations for an implementation in Russian industrial companies of energy saving and resource saving, ecologically safe, low-waste and zero-waste technologies. The role of technological innovations in a modernization of economics in a whole and industrial production is pointed out. The result of the conducted research, from the point of view of an evaluation of technological innovations' importance in modern companies' functioning, is the broadening of the conception of competitiveness of a company, which is reflecting the necessity of making the functioning of modern companies more dynamical by creatively absorbing and adapting world's industrial and technological innovations.

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Introduction

Conditions in which contemporary companies are functioning are characterized by changes in sources of their competitiveness and a change in the nature of economic growth. National companies not only in economically developed, but also in developing countries are becoming increasingly influential globally, changing a structure of global production chains and accelerate changes in the balance of economic potential of states. In that way, in the last 20 years in Russia a series of high-tech companies (Parallels, Acronis, Kaspersky, ABBYY, etc.) with multi-billion dollar market capitalization and high technology products have appeared and become internationally recognized.

Recently had appeared the idea hypercompetition which is characterizing contemporary confrontation of productive forces of the world market and it had become widely used in business and science. The phenomenon of hypercompetition defines a particular importance of an actualization of sources of competitive advantages, a rapid adaptation of management to permanently increasing complexity of economic trends for companies. Especially important in this regard are sources of an innovative growth of industrial companies, in particular technological innovations. Increasing the importance of an implementation of an innovative source and factors of a competitiveness increase of industrial companies is related with the fact that the direct competition of

Russian companies with companies of leading countries can lead to the loss of entire domestic industries and markets.

Theoretical background

In works of Russian and foreign researches problems of competitiveness of companies, industries and countries are studied in a great detail [1-2], the dominating role of knowledge-intensive industries and informational technologies is proved [3-4], a condition of various national systems of research and development and industrial and innovation politics are evaluated [5-6], the technology innovation program [7]. The analysis of a significance of technologies improvement processes, innovative technological exchange etc. is provided [8, 9]. In some papers it is proved that as a result of an implementation of new technological solutions companies are obtaining a priority in a production of additional value.

Scientific views, reflecting peculiarities of modern effective industrial technologies in economics and their role for competitiveness of companies are presented in works [10-13]. According to a famous theoretic of technological forecasts B. Twiss, the main problem of technological development is not related with a presences of some kind of innovations of any possible type, but in a stable and profitable usage of industrial scientific and technological products in a company's activities [14-18].

Analysis of various approaches in understanding of essence and role of technological innovations for economic development and an increase of competitiveness underlines the necessity of a modern understanding of a significance of an innovational nature of a company competitive strength.

Methodology

The study of an influence of technological innovations on a competitive strength of companies, a relationship between a technological development of a company and its innovation activity is based on three main methodological approaches:

1. The object approach is defining significance and a dependence of a technological development of a company from an implementation of a new technology, a new technological process or a new system of an organization. This approach allows to estimate a contribution (significance) of an applied application of R&D results, an importance of a direct funding of breakthrough scientific topics and a support of education and, as a results, an improvement of an industrial production's structure by a production of high levels of manufacturing.

2. The object-process approach. With the help of this approach results of industrial companies' manufacturing activity related with technological innovation's implementation were studied.

3. The process approach, which considers a process of object's transformation or change (in the present research – the relationship between a competitive power of companies and implemented technological innovations).

Results and discussion

A study of theoretical approaches and practices of an innovational development, based on an implementation of new technologies of Russian and foreign companies, showed, that the conception of new technological solutions has many aspects. From another point of view, a modern understanding of a competitive strength of a company is discussed as a potential and a real possibility of a company, in context of its environment, real manufacturing conditions and business strategies, to design, produce and sell products more attractive for customers in terms of price and functional properties than its rival's products.

To exemplify, consider first ten EU-member countries by a number of innovation companies and types of innovations that they are using (table 1 is based on [19]).

Table 1. Top-10 EU-member countries by a number of innovative companies and a structure of innovations used

Country	Number of innovative companies in a total number of companies, %	Number of innovative companies using only technological innovations in a total number of companies, %	Number of innovative companies using only non-technological innovations in a total number of companies, %	Number of innovative companies using both types of innovations in a total number of companies, %
Germany	79.5	18	13.5	48
Luxembourg	68.5	9	16.5	43
Iceland	65	18	5	42
Belgium	61	19	8	34
Portugal	60	12	15	33
Sweden	59	16	11	32
Ireland	59	13	13	33
Estonia	57	20	9	28
Netherlands	57	19	9	29
Austria	57	13	12	32

From the presented table it is clear that in an innovatively developed countries, the most of innovatively active companies are using only technological innovations or mixed innovations. Minor part fall on companies which are building their innovative activity basing only on non-technological innovations (from 5% to 16.5% for mentioned countries). Thus, both in modern scientific approaches and in a practical knowledge intensive nature of a competitiveness is clearly visible.

That's why modern industrial companies are providing their competitive strength by overtaking rivals in a process of technological and technical development, which allows them to update their products faster than others, improve patterns of a manufacture organization and sales. A permanent creativity and a possibility of an anticipating supply of new products and services, which better satisfy customers' preferences to market allow a company to be successful.

All manufacturing improvements are divided in two main categories: technological and non-technological. At the same time, in particular, new technological solutions are becoming more and more significant, reflecting an intensity of manufacturing organization methods' development and, finally, determine a character of a scientific and a technological advance in industry. Thus, for providing a competitive power for companies' production, all stages of a technological development have to be realized: advanced ideas – investments – products development – implementation – obtainment of qualitative increase of customers value – overtaking rivals in satisfying demands of a target market.

In the context of presented research, new technological solutions are discussed as radical or gradual (incremental) changes in products, processes and a strategy of industrial companies, functioning in conditions of direct competitive interaction with foreign companies. Therefore, new technologies, designed for a development and an adaptation of more consummate products, are becoming more

significant; technologies designed for an equipment modernization; for an implementation of energy and resource saving, ecologically safe methods of a manufacture; low-waste and zero-waste technologies; technologies designed for reconstruction of basic assets, realization of ecological programs, maximal usage of a productive potential, diversification of a manufacturing activity of Russian companies during their international competition and others.

Analysis of different approaches and definitions of Russian and foreign specialists and also a practice of companies' operations, which are putting technological innovations to practice, allowed to make a conclusion, that in a process of a company's technological potential development following goals are achieved:

- Advanced, protected by patents and licenses copyrightable types of products and methods of their manufacture and sale are implemented;
- Manufacturing of new products and services, which quality is on par with foreign analogues and even surpasses world's level, is provided by Russian companies;
- Cost efficiency in manufacturing and consuming of a product in comparison with a traditional and competing products is increased.

Strict correlation between competitive positions, an innovative potential, a technological level of a company and an effectiveness of its operations is visible, which we had already discussed before [20]. In modern conditions of a competition, simultaneously several parameters of a competitive advantage have to be realized, which is achieved, primarily, by technological innovations as they allow to overtake competitors in a development and an adaptation of new products and in a perspective of a new equipment implementation, a formation of new ways of products' consumption and, therefore, a new system of sales, after sales maintenance and logistics. For a contemporary companies—leaders an average rate of profit must be higher that and its average level in an industry, which is provided particularly by an innovative competitive strength.

New technologies and equipment are used in company operations in various aspects, determining its competitiveness. Perspective products are necessary for companies, but still not sufficient, because stable connection lines with a target market in context of interaction marketing are necessary. At that point it's clear, that new effective technical solutions which are realized in products are unambiguously determining its possible success on a target market.

Rapid complication and a rise of price of R&D at a modern stage of development in the most significant directions and stages of scientific and

technical research stimulates a demand in a repeated widening and intensification of technological innovations. A possession of leading technologies under conditions of globalization of economic life becomes an extremely important factor in providing advantages in a competition. This increases a significance of innovative equipment and innovative technologies as a commodity in world commerce, determining a high dynamics of the world market of technologies and its scales. At the same time, under condition of a contemporarily stage of science and technology development, in industrial production most of technologies are not used until their physical deterioration. Moral depreciation, which terms are continuing to decrease very fast, had become a decisive factor. That's why companies sometimes don't patent their inventions, if inside a term of their moral depreciation they can't be effectively reproduced by their competitors.

Thus, it becomes clear, that a creation and an enhancement of an each new technological process demands new organizational and manufacturing forms, especially, an optimization of knowledge management. Considering that in the world's best industrial companies a production process is fully automatized and robotized, its future improvement is possible due to the six technological mode, main stages of which are already had been deployed in developed countries. In these conditions international technological exchange and international high technology products' trade starts to play a special role. These will mediate all important spheres of social life – science, technology, manufacture, management, helping accelerated renovation and modernization, structural reconstruction of industries based on innovation diffusion.

An analysis of a structure and dynamics of an international trade of high technology products for the same countries as in table 1 showed that in this characteristics they are leaders as well (see table 2) (based on [21]).

Table 2. Top 10 EU-member countries by a volume of an international trade of high technology products in 2011

Country	Exports, million EUR	Imports, million EUR	Exports/imports balance (million EUR)	Exports/imports ratio (%)
Germany	142239	126613	15626	112.3
Luxembourg	3883	3502	381	110.9
Iceland	-	-	-	-
Belgium	26569	25420	1149	104.5
Portugal	1255	4172	-2917	39.1
Sweden	18662	17851	811	104.5
Ireland	18876	8878	9998	212.6
Estonia	1787	1892	-105	94.5
Netherlands	83055	74850	8205	111.0
Austria	14274	14390	-116	99.2

In contrast with that, in Great Britain export/imports balance is negative (59714-74121=-12407 million EUR in 2011) [21]. Thus, statistics

showed that those countries where an innovativeness is higher and where it is based on technological innovations, characteristics of an international exchange and results of international trade of high technology products are better. Portugal is getting out from the presented list with a considerable exceed of import over export. But in that country negative economic situation had formed long ago and the situation is getting only worse and had become a serious economic crisis.

The biggest effect of technologies' movement, especially modern and innovative is achieved not only by a producer and a consumer, but also in adjacent, connected and interconnected fields. At the same time, so-called escort-effect appears.

Forms of realization of a transfer of innovative equipment and technologies on the world's market are different and comply with a one goal of an attraction to obsolete companies of ready-made technological solutions, know-how and production secrets. In a business practice typical forms and contracts of an international technology transfer are developed, which differ from each other in form of payment for a transferred intellectual property – lump-sum payment or differed payment, depending on a production volume of a licensed product (royalty). Additional profits of a company, received from realization of innovative production are taken as a base of assessments' formation. Transfer of a ready-made production is also profitable and a participation of Russian companies in collaborative researches and developments, a cooperation in scientific and technological activities, a realization of big international industrial projects.

International scientific and technological cooperation and a collaborative international research activity of scientific and industrial organizations is carried out predominantly on a stage of an industrial adaptation of R&D results and technologies commercialization. That's why for an increase of a competitiveness of companies based on an innovative technological potential in Russia it is important to recreate an engineering basis, comprising state R&D institutions, universities, high technological small enterprises; a support of engineers and scientists mobility between state science sector, education sector and business sector [22, 23, 24]; a participation of R&D sector of Russia in global chains of added value creation; a formation of an attractive environment for foreign specialists activity in the field of R&D in Russia.

The role of national factors such as a presence of a branched network of organization carrying out R&D activities, development of connected and related branches, which are supporting a stable development of a process of recreation.

Generally, the value of an innovative technological potential of an industrial sector in a country-wide scale is determined by a presence and ponder ability of research and development, planning and design, technology adaptation organization, experimental production facilities, educational institutions, personnel and technical funds of these organizations.

Conclusions

Basing on the presented analysis, following conclusions can be made.

Contemporary nature of competitiveness of companies is discussed from a point of view successful implementation of technological innovations, based on a permanent conduction of research and development, which allow to overtake competitors and also to support manufacture of a better products and services inside the country and abroad.

Competitiveness of contemporary industrial companies is achieved as a result of their innovation potential of all kinds, reflecting possibilities of companies in an anticipating implementation of science and technological advances and new methods of a production's organization.

To increase a level of competitiveness of Russian industrial companies it is important to study and implement a progressive experience of developed countries in an enhancing of an economic and an organizational basis of scientific and technological progress, support Russian companies and organizations in an implementation of advances of science and technology, provide a targeted support. In case of small volumes of investments of Russian companies in an industrial research, it's necessary to use a policy of a wide absorption of technological solutions which had already proved their effectiveness.

A competent innovative and technological policy of Russian industrial companies from the point of view of their international competitiveness implies an implementation of technological innovations in all direction of industrial and business processes.

Corresponding Author:

Elena Danilina
Moscow State University of Instrument Engineering and Computer Science, Letnaya str., 38-1-92, Mytishchi, 141021, Moscow region, Russia

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