

Structural Analysis of the Processes of the Diversification in the High-Tech Industries

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Abstract: The article investigates the approach of the organization of technological transfer of high-tech corporations. This can be used to solve problems of diversification regarding the rapid global changes of the world markets, taking into account prompt technological development. Technological transfer is understood as an expansion of the use of technologies for the production of defense products in the sphere of civilian products. The model of diversification of activities of corporations is determined. The model is used for sales volume expansion of civilian products at the technological level as well as at the level of direct production of goods and services.

1. Introduction

Rapid change of world market conditions under the influence of new technologies (Industry 4.0) and a broad transition to digital technologies, qualitatively change traditional industries and create new markets. Thus, activities of the National Strategic Initiative include eleven projects targeting active performance in emerging and evolving markets. [1]. The processes of digitalization are understood as the widespread deployment of digital technologies at all levels of management, starting from an enterprise to state management. As a result, expansion of their increased usage brings qualitative changes in the socio-economic sphere.

2. Importance of Intellectual and Technological Potential of a High-tech Special-Purpose Production of the Russian Economy

In the context of these global changes that world markets are facing, the effective use of accumulated intellectual and technological potential is of particular importance for the Russian economy. Those changes are concentrated mainly in the military-industrial complex (MIC) as a high-tech special-purpose production.

On the one hand, the military-industrial complex should expand the production of high-tech civil purposes products. On the other hand, they should qualitatively accelerate innovation processes in defense corporations. Also, they should change the approaches to the commercialization of their achievements. The leadership of the country formulates objectives of transformation of the economy of these companies. In general, management should be restructured and it should explore market approaches where the main focus is on the target consumer and his needs.

The other side of this reform is the need to develop ways of cost management. The process of funding activities should be based on investment principles as well as on principles of expanding the attraction of private capital. Transition to a qualitatively new level of commercial activities of the MIC enterprises becomes one of the key tasks.

In other words, the issues of effective management in market conditions should become the key operation for enterprises of this category. This rule can be accepted in enterprises where the fulfillment of the state defense order is only a part of the company's activities.

3. Research Methods

Management is the key to achieving goals of conversion. The solution of provided tasks involves the study of the current situation in the management of diversification processes. At present, all high-tech special-purpose production corporations represent a model of an organization with multiple brands. In our case, these are well-established names of full-cycle corporations, such as Kalashnikov Group, or its association ZALA AERO, Kalashnikov, Baikal, Izhmash, Rybinsk Shipyard. [2] Such an organizational structure of the corporation allows ensuring controllability of the diversification processes of defense enterprises. This means that the Group produces swimming equipment for civilian use, drones for agriculture and forestry, etc.

Another example is Shvabe Holding which specializes in the "development and mass production of optical and laser systems and complexes, modern optical materials and technologies ...". The holding company manufactures appliances and high-tech civil engineering equipment in seven areas [3].

4. Discussions that are Currently being Implemented

Currently, a number of projects are being implemented for using technological and design potential of concerns for civilian production which can be grouped in the following three areas.

1) Development and production of civilian products on the basis of military equipment. There are various examples:

- development and production of medium-haul and long-haul passenger airplanes, sports and training aircraft, helicopters for medicine (for example, Anat helicopter made by the Holding of Russian Helicopters);
- space exploration of mineral resources, meteorology, exploration and control of forest land (the fight against illegal lumberjacks);
- creation of drones for foresters and firefighters of forests, including drones for conditions of absolute invisibility due to meteorological conditions, etc.

2) Creation of new technology for production of goods in the B2B sector. For example, the arrangement of research for orders for large trading companies by P&G model for the production of goods for developing countries with low purchasing power [4].

Production of finished products and their independent entry to the market. Examples include photo and film equipment with an image stabilizer, a router and a driver load controller for vehicles including freight transport through the Glonass system. For space activities that would mean the expansion of commercial launches, the production of satellites for commercial orders, commercial use for scientific research on the ISS [5].

4.1. Formation of New Direction in the Technology Development for the Needs of the Defense Industry

On the one hand, this is about the system of identification of partners for research projects for solving technological problems in the production of military equipment. On the other hand, this is about the formation of a system for collecting, systematizing the research and commercial potential of side discoveries and results in targeted studies for the needs of manufacturing defense products.

This is about the implementation of large projects of national importance. An example is the ambitious task that high-tech special-purpose production companies are facing, that is the creation of domestic subsea mining complexes. The main feature of such large-scale project is the creation and production of subsea mining complexes using exclusively domestic components and IT systems. At the same time, the market for these complexes is just being formed. Within our country there is a demand for about 50 such complexes, and the global market is estimated by the extraction on the shelf of various kinds, ranging from the Caspian to the Arctic [6].

Analysis of experience of Western companies shows that the solution for the issues of creating new value propositions is based on the system of constant work with the consumer. It should be carried out both at the design stage and at the stage of product presentation and promotion to the market. Creating such a system is a long and expensive process associated with certain risks and failures. Company`s strategic asset is formed by accumulated experience which compose one of the elements in ensuring company`s long-term competitiveness.

4.2. Direction of Organizational development of Corporations for the Production of Defense products

For large companies like Rostech Corporation, such an expansion of the scope of conversion implies the creation of special organizational structures. The structures are focused on market research and product promotion. In particular, for Rostech this is the creation of marketing corporate center. The main objectives of the center should be, firstly, the methodological support of the needs of enterprises for marketing research. Secondly, the center should serve as a support unit for market research for corporation entities. Due to the multidirectional production concentrated in the corporation, ensuring methodological unity is of particular importance for eliminating unhealthy competition among its entities in the market. At the first stages of work, the center can be limited to solving the tasks on the request of the corporation entities to create products for the B2C market. At the subsequent stages it is not only about products for B2B, but also the actual production technology for the needs of enterprises of civilian industries with appropriate protection and standards for the market use of intellectual property.

On the other hand, the conversion efficiency based on the use of technological innovations in production of military products implies the formation of new organizational and research culture. This is a parallel study of the use of new technology and materials for both military and civilian products. Effective experience in organizing work in this direction is demonstrated by Shvabe Holding. The project of the company called "Open Innovation Window" focuses on working with external innovative proposals and projects. In terms of content, this is one of the mechanisms of open innovation of the holding aimed at collecting and examining incoming innovative projects and proposals for possible joint implementation. Innovation is expanding in the area of support for start-ups through the Rostech venture fund [7].

At the same time, an important direction for the diversification of Rostech companies is to reduce barriers for joint activities, as well as to accelerate the transition to market mechanisms for managing civilian production. This is the legalization and concentration of tasks of this function of

diversification processes. We are talking about creating a business support unit within Rostech, as an example let us consider the Business Support Center. Let us examine its main functional tasks within the framework of the Rostech Corporation.

1. Identification of production and research projects that can be outsourced.
2. Definition of a set of types of finished products, the formation of the main direction of market expectations, through the elimination of "marketing myopia" and its modern presentation and tools.
3. Development of the register of technologies of the Rostech corporation, competences of enterprises with their carriers.
4. Formation of relations with partners, suppliers and distributors.
5. Development of methods for ensuring the processes of opening a trading business corporation.

As additional functions of Rostech's center which supports the above directions of technological transfer of the All-Russian Socialist Scientific Network to civilian production, as well as taking into account the wide variety of activities included in its composition, the following can be mentioned:

- The technology of designing a new product based on the methods and approaches to eliminate marketing myopia, forming a value proposition for the consumer.
- Technology of effective merger of companies as entering new markets and increasing sales volumes under the Rostech brand.
- The system of support of core competencies of enterprises of the corporation Rostech.
- Management system and process performance monitoring.
- Development of methods for solving problems of using excess capacity and unused assets, incl. creating centers for the collective use of unique equipment.
- Attracting external development resources. Formation of a bank of technologies offered by startup in the world market in the conditions of digitalization of the economy.
- Protection of intellectual property (IP) of a corporation, work on the market to expand the market (license sale mechanisms for expanding the markets of specialized products), work on introducing standards in new technologies (for example, augmented reality technology for production processes) [8].

5. Conclusion

Thus, technological transfer is understood to be the expansion of the use of technologies for the production of defense products in the sphere of civilian products involves the following tasks. First, the current situation with the creation of a new product and its launch on the market is characterized by companies independently resolving these problems. In other words, the risks associated with these processes and excess costs are fully borne by the enterprises of the military-technical supply network.

As the analysis of the experience of Western companies operating in the mode of diversification of production to maintain competitiveness shows, the processes of expanding the use of technological capabilities have certain regularities. Effective solutions to these problems with minimal cost require a highly professional approach to working with the market and consumers. This particularly applies to high-tech products, changing consumer lifestyles, carrying new standards of consumption. In order to minimize costs, it is advisable to conduct such problems in the first stages of the transition to expansion processes of defense production diversification on the principles of centralization.

Secondly, the formation of new structural divisions in the corporation is needed. The functionality of these units should not be limited only to marketing research. These units should be aimed at optimizing the search processes for potential partners of manufacturers of both suppliers of equipment, components and materials, as well as logistics and sales companies.

Thirdly, the strengthening of the sphere of civilian production at the enterprises of the Military-Technical Networks involves additional investment to solve the problem of bringing its share in the total volume to 50% in 2030. Considered proposals allow you to create a mechanism for managing production diversification processes and ensure survivability through market financing mechanisms. Achieving this situation creates the potential to reduce the burden on the budget dictated by our country's defense needs.

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