Development of Small and Medium-Sized Businesses Through Technology Transfer, Innovation Strategy and Network

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Abstract. In this article, the authors have identified the process of technology transfer development, identified the most promising areas for the development of small and medium-sized innovative businesses. In recent years, understanding the combination of technology transfer and innovation strategy has become a key element in ensuring the development and growth of SMEs, as it has expanded their opportunities to be part of networks and facilitated their access to international markets. The authors of the article examined the basic concepts on this topic, analyzed the experience of foreign countries in terms of technology transfer, and also revealed the main problems that are an obstacle to the implementation of an innovation strategy. It is concluded that without effective cooperation and the formation of an innovative infrastructure supporting small and medium-sized enterprises, the activation of the technology transfer process is impossible, and small and medium-sized enterprises can balance their limited resources with careful participation in networks.

1 Introduction

Many small and medium-sized enterprises need to be part of networks in order to receive their innovations and develop special competencies in the field of technology transfer and rapid access to international markets. Although there is a well-developed tradition of studying industrial networks, there is no analysis of systematic and empirical models of networks related to technology transfer and innovation strategy in the context of internationalization of small and medium-sized enterprises.

It is well known that important drivers and approaches to innovative network capacity and the effectiveness of SME internationalization are crucial for entrepreneurs in improving the efficiency of their firms at the international level. In the era of the formation of the technological order, in the conditions of strengthening integration ties and international competition, innovations are priority sources of economic growth. In order to regulate innovation activities, a regulatory framework and innovative infrastructure are being formed to stimulate the process of technology transfer and management.

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2 Research Methodology

Small and medium-sized enterprises (SMEs) have attracted the attention of numerous researchers in recent years with their active position in international markets. SMEs quickly consolidated their positions in global markets and used international diversification as an important strategic choice for growth. The contribution of SMEs to innovation has increased over the past decades due to changes in the way innovations are introduced into the economy. SME innovations are no longer limited to corporate research laboratories, but are the result of joint and synergistic efforts, when organizations interact and exchange knowledge and information with various partners within broader innovation structures.

The innovative potential of small and medium-sized enterprises and the introduction of new production strategies were considered key elements of development, but it was not immediately clear where these new technologies came from. Technology transfer was used to solve this problem, while the innovation strategy was cited as the driving force of economic growth. Indeed, technology transfer and innovation strategy are recognized as important elements for achieving the goals of SMEs that ensure growth, sustainability and competitiveness. These are completely broad concepts involving many different stakeholders, from governments and scientists to business leaders, advertising and marketing experts and consumers.

The technology transfer and innovation strategy has been accredited in various fields of research, as well as in regulatory and policy planning documents. The diversity of the parties involved leads to exceptional prospects for technology transfer and innovation strategy, which leads to different know-how of both concepts. Their main strategic goal is to promote scientific excellence, innovation, collaboration and interdisciplinary research methods in many fields and technologies, as well as to achieve a certain long—term recognition in the European environment. In particular, in knowledge-intensive sectors (for example, in biotechnology), small businesses are often a source of radical innovation due to their flexibility and ability to work with dominant knowledge paradigms.

3 Results and Discussions

In recent years, technology transfer has become the main tool for acquiring knowledge, which has led to the emergence of complex innovation networks.

Today, the network involves the exchange of knowledge and technologies, as well as the transfer and sale of the exclusive right to use them between legal entities and individuals.

The development of the network is aimed at:
- promoting effective innovative transnational cooperation and project activities;
- launch of a comprehensive package of services for small innovative companies;

Thus, for the development of small and medium-sized innovative entrepreneurship, the technology transfer network is of particular importance.

Technology is a term derived from the Greek technologia, techné (art, skill) + -o- + -logia (words, speech). In particular, this refers to how people satisfy their needs and desires through the systematic study of technology and the use of inventions and discoveries. More generally, it means a way to accomplish a task, especially using technical processes, methods, or knowledge. A general definition of technology transfer can be made by looking at the latin origin of the word "transfer" - to state that in latin "trans means over or across the border, and ferre means to carry"; the word "trans" suggests that in the process of transfer the border is crossed, meanwhile the concept of transfer refers to something that is done decisively, specifically [1].

In the 1980s and late 1990s, the classical literature offers several definitions of technology transfer, which emphasizes its relevance. Technology transfer was originally
defined as the process by which technology is moved from one physical or geographical location to another for use in the final product. This transfer can take place either internally from one sector or firm to another sector or firm, or across national borders, from one country to another, which is usually considered an international transfer of technology. According to Kone, technology transfer is the process by which technology developed for one purpose is used either in a completely different application or by a new user. Some scientists define technology transfer as "the acquisition, development and use of technological knowledge by a country other than the one in which this knowledge originated" [2].

V.V. Ivanov defined technology transfer as the transfer of know-how in accordance with local conditions, with effective absorption and distribution both within the country and from one country to another.

Thus, technology is not just one of the sources of growth and viability for individual enterprises and entire countries, but in many cases a central source. According to V.Y. Vilisov, technology transfer is an act of exchanging know—how through mechanisms such as permanence, joint ventures, gifts, licenses, franchises and patents, on the other hand[1]. Sekerin considers technology transfer as the transfer, adaptation and use of technology from one place or economic region to a second region. He also adds that this technology must be adapted by the receiver to local conditions in order to match its social, political, cultural, economic and educational environment[3]. Some academic economists point out that the introduction of new processes often requires solving serious problems and even innovations at the plant level.

The degree of changes in technology is influenced by the attributes and business environment of the units involved in the transfer. Knowledge can also be transferred through training and education, which may include learning how to effectively manage technological processes and changes.

There are many basic characteristics of technology transfer arising from the definitions above: first, technology has several elements and aspects and almost always includes more than one technology component. Numerous components of the technology, considered in a very specific case, interact with each other as if they make up a system. In addition, the technology package should be periodically reassessed to treat conditions as the project cycle progresses and as new information becomes available. Consequently, modification and further development of technology are very often an integral part of the transfer. This is usually due to a change in the scale of the production process and the adaptation of products to the characteristics of the local market. A technology developed in a very specific context can hardly ever be introduced into a new environment without at least some modification. Thus, modification and further development of technology are very often an integral part of the transfer. This is usually due to a change in the scale of the production process and the adaptation of products to the characteristics of the local market.

In order to develop a precise definition of an innovation strategy, it is important to define the concept of innovation. J. Lerner notes that "innovation can be defined as the effective application of processes and products new to the organization and designed to benefit it and its stakeholders" [4].

Some authors focus on innovations in the organizational dimension, considering them "a process involving the generation, development and implementation of new ideas and behaviors," as well as a multi-stage process through which an organization transforms an idea into a result, a new or improved product or process in order to stand out and compete successfully in the market[5].

Schumpeter identified five sources of innovation[6]:
- introduction of a new product or a new quality product;
- introduction of new production technology;
- opening of a new market;
- the conquest of a new source of raw materials;
- the process of reorganization of any industry.

In addition, Schumpeter emphasized the role of the entrepreneur in the innovation process[6].

However, the resources of small and medium-sized businesses are limited, this disadvantage can be compensated by flexibility, maneuverability and innovation. The potential growth effect associated with an innovation strategy in SMEs depends on three input parameters:
- technologies;
- R&D;
- creation of competitive advantages[4].

Based on the above, Utkin E.A. offers the following definition of strategic innovation: "Innovation strategy is the relative emphasis of a firm on various types of innovations and the associated resource allocation model in accordance with its strategy in the corporate business unit and functional levels" [7].

Consequently, innovations can also include new technologies, intellectual property, business and physical changes.

Accordingly, the planning and implementation of an innovation strategy is a key factor in determining the scale of innovation, which in turn determines the financial performance of the company.

4 Conclusions

World experience shows that the innovative activity of small and medium-sized enterprises is developing by simplifying access to scientific and technical information, embedding firms in local and global production chains. Small and medium-sized enterprises create and disseminate fundamental and improved innovations in the short and long term[8]. The experience of foreign countries testifies to the need to formalize and implement a systematic state approach in Russia regarding issues related to stimulating innovation activities of small and medium-sized enterprises.

Instead of simple innovation theories, several approaches to working with different types of predictive variables based on innovation are proposed. V.D. Sekerin notes that the innovation strategy is carried out in inter-organizational networks[3]. On the other hand, there are several author's positions that SMEs have gradually become part of networks in which resources, knowledge and data circulate quickly and depend on coordinated efforts and partnerships[9]. The diversity of knowledge within the network is beneficial because it creates positive externalities for many agents through the dissemination of knowledge, opening doors for innovation. At the same time, I.V. Berezhnaya argues that being part of the network and being able to effectively use the data that circulates in the network turned out to be much more profitable than being able to independently produce new knowledge[2]. Vilisov V.Ya. emphasizes that cooperation within a network of partners becomes necessary, while Cohen suggests that the network's valuation increases with its normal size[1]. Interaction with external partners allows the firm to gain access to new knowledge, while network connections seem to increase the effectiveness of innovation. Despite the fact that SMEs make a significant contribution to open innovation, the process of open innovation affects them differently than large firms.

The results show that innovations in SMEs are becoming more open due to the lack of resources for self-development and commercialization of new products, and as a result they are increasingly inclined or forced to cooperate with other organizations. This suggests that the immediate consequences of network connections may vary in the case of SMEs. Networks provide access to social resources that encourage exploration and exploitation of small and medium-sized enterprises[10].

Consequently, the relationship between subjects and variables, as a strengthening of the network capacity of SMEs, can be used as a driving force of changes caused by the process
of internationalization. Networking gives SMEs several advantages. SMEs usually need economies of scale in research, have less access to data and other key innovation resources.

In addition, small and medium-sized enterprises do not have enough opportunities to exclusively manage the entire innovation process, and therefore they are encouraged to cooperate with other firms, which contributes to the potential pooling of resources and data.

Thus, the efficiency of an enterprise may depend not only on its internal knowledge, but also on the effects of network interaction both at the state and international levels. According to the results of the study, it can be concluded that there is no universal model for supporting innovative activities of SMEs, which would be effective for all countries. Each state chooses an individual path for the development of an innovative economy. Particular attention should be paid to the system of interaction of all authorities in order to support SMEs. It is impossible for our country to stimulate innovative activities of SMEs without improving the legislative system, cooperation between government, science, education, business, regular study of international experience in the field of nanotechnologies, which is especially important in the current crisis and sanctions from a number of countries. It is also necessary to form technology transfer programs at the level of technoparks and develop risk insurance programs for lending to innovative SMEs.

References

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