Place of Scientific and Technological Production Preparation in the Forming of Enterprise Competitiveness Strategy

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Abstract. The research considers the reasons for the loss of competitiveness of enterprises under its subspecies. Correlation of major functional competitiveness strategies occurred within the limits which implemented measures STPP strategies and higher levels. The influence innovation processes under STPP were considered as part of the production and technological strategies for achieving competitiveness.

Key words: strategy, strategic management, competitiveness, innovation development, scientific and technological preparation of production

INTRODUCTION

In today's business environment the success of the enterprise market is directly related to the upgrade of production, introduction of innovative technologies, the application of advanced scientific developments in practice. These factors are key to strong market positions and positive business results. Therefore, Ukraine is extremely important to the preservation and development of national industrial complex, its focus on meeting the needs of society through product updates, improving its properties based on the significantly improved organization of scientific and technological activities of enterprises and other organizations involved in this activity, and also the introduction of advanced technologies.

Also, the company must constantly look for ways to respond to the demands of the external market environment to gain competitive advantage [21]. The strategy just serves to study competitive advantage to achieve its mission and objectives.

Strategy is the element that connects the requirements of internal and external environments, availability of resources and competitive advantages. Without a strategy, organizations can end up with dispersed resources, and mistaken purposes. Many scientific research (for example [26]) represent the viewpoint that the introduction of the latest production technologies cannot positively affect the performance of the company, if it is not made in accordance with a specific strategy.

Among recent national publications on the issues of competitiveness of enterprises there is the research of R.Fathutdinov [9], D.Maksym'yuk [17], M. Porter [21], O.Kuz'min [16], which considers some management techniques competitiveness of different business entities. Strategies for the development of enterprises was investigated by V. Ponomarenko, O. Trydid, M. Kizim [20], the practical aspects of innovative development of enterprises in Ukraine – by V. Zakharchenko, N. Merkulov, L. Shiryaeva [31].

Despite the comprehensiveness of strategic management research and innovative development in the publications of scientists, still relevant and still incomplete aspects of the relationship measures innovation, realized at the stage of scientific and technological preparation of production (STPP) and strategic management in general, and their impact on competitiveness within the limits of the functional competitiveness strategies in particular.

MATERIALS

The main task of this research is to study the impact of innovation processes under STPP as part of the basic functional strategies for achieving competitiveness and positioning STPP in forming the strategies of enterprise competitiveness.

Strategy forming involves three levels: corporate strategy defines the overall direction of the enterprise, business strategy concerns the business units, and functional define the specific means of achieving competitive advantages enterprise [12].

In general, the publications stated that the formation and importance of certain functional strategies depends on contextual factors such as the scope of the company, the type of product produced, stage of life cycle, size of company, type of market, etc.

Exploring the relationship with the corporate production strategy, business strategy and other functional, one group of authors considers that corporate strategy directs business strategy, which in turn controls the production strategy. In the research [18] the author states that the production strategy is reactive and subordinated to business strategy. According to [19], production strategy is "projected model of production possibilities, which is formed to improve production capacity and support higher levels of strategy". Analysis of the results of the research [25], conducted in developed economies, represented significant differences in the use and effectiveness of various functional strategies (Table 1).

Table 1. The use and importance of various functional strategies

Functional strategy	The use of the past	Importance in the future	Efficiency in the past
Production (operating)	4,63*	5,24	36,6
Research and development	4,23	4,91	19,8
Marketing	4,22	5,02	15
Human resources	4,2	5,19	21,6
Technological	3,74	4,3	22,4
Organizational	3,36	3,81	6,6
Investment and economic (financial)	3,14	3,91	8,8

* Note. To determine the extent of use in the past used a scale from 1 (not at all) to 7 (great degree of utilization), to assess the importance of the future scale of 1 (not accented at all) to 7 (strong emphasis). Effectiveness was measured by averaging the past number of respondents noted the high efficiency of a particular strategy

From these data it is evident that the most important companies in the past have provided production strategy, somewhat smaller – a strategy for research, development and marketing. For efficient production, strategy as defined in the top positions, then – technological and human resources strategy. So industrial and technological improvements that are made within the limits of the innovation enterprise, most of which is under STPP, have a decisive influence on the competitiveness of enterprises.

Extremely important for the competitiveness of enterprises is to effectively organize their innovation activities, whose main objective is the timely launching of new products and improvement of the existing ones as the rapid development of their production [31].

It is the realization of this objective which aims to provide STPP of enterprises, whose main activities are carried out within the limits of the functional strategies of the company. Enterprises in this regard should always perform innovation, perform complex operations on the preparation and production of new products or the provision of new services, the introduction of new technologies and the adoption of new management solutions that provide reduction of production costs, increase competitiveness compared to competitors, etc. [27].

It should be noted that most measures of innovation under STPP are realized by enterprises within the limits of three main strategies: production (operating), technological investment and economic, although measures within other functional strategies are equally important (Fig.1).

The main purpose of innovative STPP is to provide the enterprise development, made possible by introduction of innovations, namely the production of new products or improvement of products already available, introduction of new construction techniques and technologies or improvement of existing processes, improvement of production management etc. [2, 6]. STPP includes a set of interrelated processes that provide engineering, technological and organizational readiness of the enterprise to release new products through innovative approaches to the

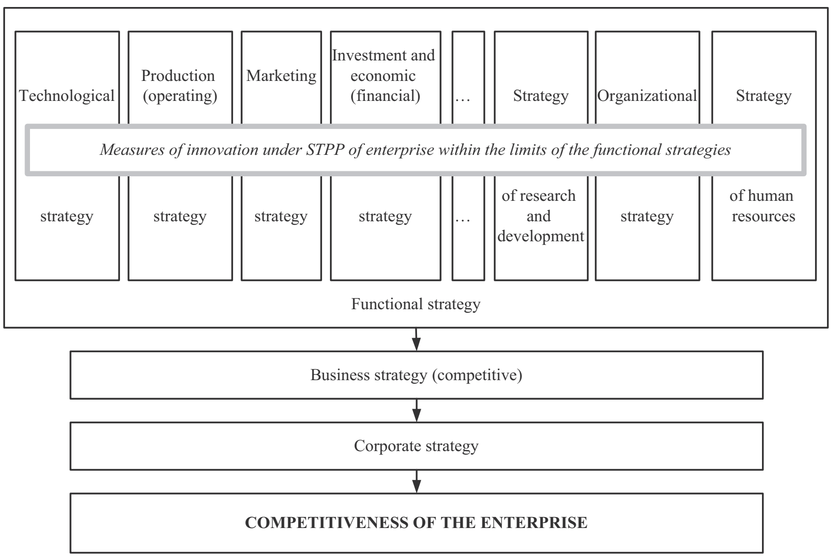

Fig. 1. Place of scientific and technical preparation of production in forming of strategies enterprise competitiveness

organization of the production process [8]. Realization of STPP is not only a wish, but a necessary concept. That is why more and more relevance is attributed to the issues of management STPP, namely to planning, organizing, motivating, monitoring and regulation.

STPP combines the processes of creation and development of new products, it involves a range of related marketing and research, technical, technological and organizational solutions aimed at finding new opportunities to meet the needs of consumers in specific types of products, to deliver products with the required functional properties and to create new and upgrade existing construction equipment, consumer properties of products, technological processes, methods of production management [27].

Already at the stage of scientific and technological preparation of production it is appropriate to analyze and evaluate the risks that the company will face and take them into account when deciding on the stage of STPP during action. Because early detection and consideration of risks in the enterprise activity is the key to the effectiveness of its activities and market competitiveness.

General tendency for risk management at the enterprise level is due to both internal demand and external factors and to the progress in developing methodologies and risk management techniques [14]. Crises can cause significant loss of inner need for risk management at the enterprise. The main external factor that leads to the introduction of risk management at the level of the whole enterprise is that investors, analysts and lenders have recently focused not only on indicators such as quarterly income, and are more interested in assessing the risk exposures of the enterprise, which can lead to loss of income. It is possible to meet their demands only if there is effective risk management at the enterprise level and coverage of information relating to risk management. Another external factor in the development of risk management systems at the level of the entire enterprise is the development of new products transmission risk, such as credit derivatives, and alternative risk financial instruments that allow the end user to choose which risks to keep and which to hedge [17]. Enterprises which have already implemented an integrated approach to risk management, received substantial material benefits, including: increasing business value for shareholders, reducing losses and smoothing the variability of income. They also won the accuracy and completeness of measurement and risk management at the level of the entire enterprise [17].

Thus, a necessary condition to ensure competitiveness in the market is the incorporation of uncertainty in planning its activities through its transformation into a risk, and then - correct plan activities and management decisions in accordance with the expected risk, namely, adapt to the environment of business uncertainty. In fact, “adaptation” – is a process of interaction of the enterprise with environment, during which, when they are in problematic (risky) situations, the company develops and uses mechanisms and rules which eventually have adaptive value.

In the economic publications categories of adaptation and adaptability are distinguished, which essentially differ, though are often incorrectly used interchangeably [15]. In particular, the adaptation - this is part of adaptability and, accordingly, its semantic value is much narrower. Adaptation is commonly understood as the actual level of enterprise adjustment of environmental conditions management, adaptability – the ability to adapt to these conditions. Particularly, I. Ansoff proposed the definition of adaptability that considers it as the ability and motivation to think and act strategically [3]. Therefore, adaptation is a current (present) category, and adaptability – a future (strategic) one. Accordingly, in order to ensure their competitiveness, enterprises need to develop and implement measures to ensure their adaptation to environmental management, which is an integral part of risk generated by uncertainty, as well as the formation of innovation-oriented enterprises adaptability, which act as a strategic factor in their competitiveness. Production and technology strategy is the link between corporate strategy and organizational and technological capabilities of the enterprise and must be consistent with them. This inter-consistency we consider as one of the major paradigms forming the production and technological strategies [28]. However, in the published research, this issue is given very small attention.

Research of strategic management issues rarely affect production. While some publications [29] emphasizes the importance of studying the influence of production strategy for activity results, yet there is not enough empirical research on this issue.

Traditionally, the production is not defined as the means of achieving competitive advantages, but only as the means to increase the effectiveness of enterprise activity[4].

For the first time the need to develop a production strategy was confirmed by W. Skinner [24] in his publication “Production – missing link in corporate strategy”. He stresses that the production has the potential to strengthen or weaken the competitiveness of the company.

In coherence strategies, one must also analyze the internal consistency of production purposes, processes, technology, organization and human resources. Any investment or changes in production processes must be consistent with the business purposes, otherwise their ever being effective at the operational level will be futile [11].

The above applies directly to technological strategy. Most of the research has noted the importance of strategic management of technology in the forming of strategy, and only some of them offer specific advice to the leaders of its formation. Besides, many researchers find that technology strategy should be formulated in parallel with and integrated into corporate strategy, but only a few of them have analyzed the benefits of this. In today’s highly dynamic market conditions, the role of technology in order to achieve competitiveness is more important than ever. Technology is one of the determinants of global competition.

For a long time goods technology considerations were fragmented,the organization of manufacturing processes and management of technologies were considered as merely tactical. However, during the last two decades technology has become the main strategic resource of equal importance with the other operating components such as marketing, finance, human resources. So, summing up the results of several empirical research, the author [7] concludes that "... to gain a competitive advantage through technology, companies need to manage technology strategically".

According to [23] strategic management of technology includes both the strategic planning and implementation strategies at two levels in the company: in general the corporate or business level to "technologically dependent" firms and functional level within a particular department or the scope of activity (for example research and development).

I. Wilson [30] considers that the technological strategy should at least cover three interrelated areas – product, processes and system development. D. Ford [10] stresses that the technological strategy should be based on policies, plans and procedures to obtain knowledge and capabilities, as well as to manage the last to reach profitability.

The publications of the late 20th century (for example [13, 21, 23]) reflect the effective development of technological possibilities and resources to find a means of creating a strong competitive advantage of the organization.

Integrating management of technologies in strategic planning involves much more than just considering technology in the formation of a strategic plan. For most companies the type of people who manage technology differs significantly from those engaged in strategic planning as to their vision and orientations. In their research [5], the authors conclude that in small technology-oriented firms, technological and corporate strategy are generally interrelated. In the initial stages of company development it is technology-oriented. This strategic planning is generally informal and the emphasis is on flexibility in research and development.

P. Abetti [1] proposed a classification of companies depending on the impact of technology on their corporate strategy and formed three main models of influence: a) the technology can be an element of reactive strategic approach; b) it can proactively influence the strategic planning process; c) it can determine corporate strategy as a whole.

Also the importance of technology is being determined as it is being integrated into the strategic planning process. The authors [13] think that the relationship of corporate strategy and technology must be highly dynamic and interactive. They describe the nature of this interaction in three models: a) the current strategy uses and capitalizes current technology; b) the current strategy cultivates future technology; c) the current technology determines the future strategy.

The first model focuses on direct coordination of selected corporate strategy and current technological capabilities of the company. The second recognizes the efforts to continually align technology and current strategy will lead to the accumulation of technologies with much more future potential than it is required to meet current needs. According to the third model, the current efforts of the company's technological development will affect the perception of the leadership of future strategy. According to the authors [13], the choice of model will depend on the stage of technological evolution of the company and the role played by the leaders of technological services in the forming of corporate strategy.

THE RESULTS AND DISCUSSIONS

Considering the analyzed scope of internal and external factors influencing innovation processes under STPP within the limits of functional strategies on activity of enterprises, it is appropriate to consider their impact on the competitiveness of enterprise in four aspects: 1) "technological capacity" - the ability of enterprise in a particular time by using existing equipment and technology to ensure technology works with STPP to ensure competitiveness in the market; 2) "human resources capacity" - the professional suitability of employees to perform STPP aimed at ensuring competitiveness of enterprise in the market in a certain extent; 3) "financial capability" - matching financial condition requirements for effective implementation STPP; 4) "compliance with market conditions" – an objective need for partial or complete renewal of business caused by changes in market conditions, a weakened market position of the enterprise and the need to improve its competitiveness.

Exploring the factors that influence the activity of enterprises, we can affirm that in order to ensure the competitiveness of enterprises there should STPP focus on ways to address the causes of its loss. The list of selected reasons for loss of competitiveness according the subtypes is presented in Table 2.

To ensure the effective development of innovative enterprises ensuring their competitiveness, we recommend to follow the implementation of the following STPP concept: 1) formulation purposes of STPP enterprise; 2) selection of exercise STPP areas that meet the stated purposes; 3) formation of applications in selected STPP areas; 4) identification of uncertainties and evaluation of enterprise adaptation to their effect at the adequate STPP stage; 5) selection of STPP considering adaptation to the conditions of uncertainty; 6) development of a plan for implementation of the selected STPP application with the influence of uncertainties; 7) implementation STPP; 8) implementation of special STPP plan in case of impact of additional uncertainties; 9) monitoring the compliance of STTP implementation plan and whether it matches the set targets.

CONCLUSIONS

The research examines the impact of innovation processes under STPP as part of the production, technological and other functional strategies to achieve competitive-

Table 2. Reasons for competitiveness loss

Subtype of competitiveness	Reason for competitiveness loss
Technological capacity	Inconsistency of the technical equipment required by the enterprise with the existing types of products requiring new functional properties
	Additional demand in engineering and technology for the creation and development of new products
	Depreciation and need for updating at the stage of creating new structures technology
	High production risks
Human resources capacity	Lack of qualification of employees and additional need for specialists to ensure the creation and development of new products
	Dishonesty of production personnel at the stage of creating new structures technology
	Mismatch qualifications suitability of employees at the stage of improvement of consumer properties of products
	High level of organizational risk
Financial capability	Low operating activities, innovation, unstable financial condition, which requires improved methods of production management
	Lack of financial resources for innovation in the development and assimilation of new products
	High levels of investment risk
Compliance with market conditions	High dynamic of market, innovation of competitors, competition, low government support for innovative enterprise development through the establishment and development of new products
	Unstable demand for enterprise products that require the provision of existing types of products required by new functional properties
	High level of innovation risks

ness in four aspects, as well as the place of innovation processes under STPP in the overall system of enterprise strategies and relationship with the strategies of higher levels.

In further research innovative measures will be specified and organized under STPP, within the limits of the functional strategies competitiveness and a system created for evaluating the impact of innovative measures under STPP on the competitiveness of enterprises.

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