

**IMPROVEMENT OF MECHANISMS FOR FORMATION, DEVELOPMENT AND CHANGE OF POWERS OF INDUSTRIAL ENTERPRISES**

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Abstract

The subject of the study is the formation, development and transformation of the competencies of high-tech enterprises that produce technically complex products, the identification of their new and meaningful characteristics, the assessment of the costs of updating the composition of competencies in order to increase innovation activity. The purpose of the study is to show various options for the composition of costs in the areas of development and transformation of the main - technical, technological, personnel, intellectual - competencies of the organization. Methods were used: graphical visualization for structuring information in directions and ways of developing the key components of competencies Since the main elements of the enterprise production system (material and human resources, equipment and technologies, organizational and managerial subsystem) serve as sources for the formation of competencies, their three basic components are: research and transformation competencies; systematization of existing scientific approaches to the development of competencies of high-tech enterprises. As a result of the study, various options for the composition of the costs for the development and transformation of the competencies of organizations engaged in the creation of technically complex innovative products were considered and evaluated in the areas of "acquisition" of competencies and on the main structural elements of the organization's competencies; the criteria for making a reasonable managerial decision on the direction of development of competencies were identified - by the organization's own resources or through the transition to distributed design and production of technically complex products; an algorithm for choosing the direction of formation and development of the organization's competencies is proposed, taking into account the proposed criteria; the conclusion is made about the economic feasibility of integrating the competencies of individual enterprises and organizing distributed design and production of innovative products.

Introduction

In order to increase the innovative activity of high-tech enterprises, strengthen competitive advantages, focus on diversifying production, expanding project activities, there is a need to develop, improve, complicate, increase, and transform competencies, since no organization can maintain competitiveness with an unchanged set of resources, knowledge and skills. , to solve new production tasks for the production of innovative, very complex high-tech products. The problem of choosing the direction of development of competencies - on its own or through interaction with innovative partners - is becoming one of the most important management tasks [1], [2], [3], [4], [5], [6], [7]. And since the costs of creating and developing competencies should provide appropriate positive effects from their use, issues related to an objective assessment of the required resources come to the fore [8].



Competence structure of the organization

Since the main elements of the production system of an enterprise (material and human resources, equipment and technologies, organizational and managerial subsystem) serve as the sources for the formation of competencies, their three basic components are:

- staff competencies;
- material resources, equipment and technologies;
- intangible assets (software products, licenses, patent rights for inventions, utility models and industrial designs, know-how, as well as business reputation as the basis of trust in the manufacturer).

Human resources (personnel) is the most important element of the production system of any enterprise. It is the competencies of the personnel (knowledge, skills, experience) that are formed in the process of educational and professional activities and manifested in the performance of official duties and solving professional problems that determine the capabilities of the organization, ensure the interaction of means and objects of labor, and affect the possibility of implementing business processes. The competencies of an organization are formed as part of the integration of personnel competencies with the technical and technological component of production and the organizational and managerial subsystem, ensuring the availability of interrelated skills, abilities and technologies necessary to achieve the goals and implement the organization's strategy. The ability of the organization to integrate the available resources and coordinate the intra-organizational processes of production and management is realized, as a rule, through the competence of the personnel.

The second, no less important, component of competencies is considered to be material and technical, which determines the industry affiliation of the organization, areas and types of activities, the specifics of production processes and, as a result, key competencies. The current stage of functioning of high-tech enterprises is characterized by breakthrough development and continuous improvement of equipment and technologies. In high-tech production, digitalization, additive and hybrid, information and communication technologies, high-performance computing systems, data mining technologies, mechatronics and robotics, biotechnology, computer modeling, artificial intelligence, etc. are widely used.

In the context of increasing innovation activity and digitalization of production, when intelligent systems integrate equipment and human resources, when digital technologies are spreading in all areas and transforming all types of activities of high-tech enterprises, the intellectual component becomes the most important element of their competencies, providing additional economic benefits, changing the cost structure, enhancing the synergistic effect. Digital high-tech production by optimizing business processes based on the use of more advanced information systems, increasing the share of intellectual and information and communication technologies opens up new production opportunities and expands innovative potential [9], [10], [11], [12],[13], [14], [15], [16], [17].

Against the backdrop of a growing tendency for production to go beyond the boundaries of a particular enterprise, dictated by the increasing complexity of high-tech products, and the realization of the expediency of cooperation and partnership in the field of innovation, an



organization's competence should also be considered its business reputation, which forms, requires certain knowledge, skills, actions and largely determines trust between partners.

The composition of the costs for the formation, development and transformation of the technical and technological component of the organization's competencies. The development, improvement and transformation of the technical and technological component of the organization's competencies become relevant in a situation of changing the organization's strategy, in particular, in the case of organizing a new production (enterprise), with its diversification, since the development of a new high-tech production, the release of new technically complex innovative products require changes in technological processes, modernization of equipment, technical re-equipment, reconstruction and reorganization of production.

The development and improvement of equipment and technologies not only contributes to the diversification of production, but also enhances the competitiveness of the enterprise, strengthens the key competencies of the organization. The traditional approach is the development and transformation of the technical and technological component on its own or with the involvement of third-party organizations (Fig. 1).

Given the increasing technical complexity of innovative products, manufacturers are not always able to reproduce the relevant technical and technological parameters and conditions necessary for its production. The reason for this may be both the high costs of equipment modernization, reconstruction, reorganization of production or technical re-equipment, as well as the inability to implement the necessary organizational and technical measures. In such situations, the only right decision can be cooperation with partners who are able to "close" individual stages of the production process, since they already have and use the appropriate technical and technological competencies in their arsenal. An innovative partner, while maintaining legal independence and ensuring the safety of its key competencies, becomes a participant in joint production activities [18], [19], [20].

The choice of the direction of development and transformation of the technical and technological component of the organization's competencies should be carried out taking into account two criteria:

- technical and personnel capabilities;
- economic feasibility.

The technical and personnel possibility of developing and transforming the competencies of an organization depends on its production potential, the ability to transform existing competencies for new strategic tasks. Often, innovative activation dictates the need to go beyond the scope of mastered activities, which may be due to the technical and personnel impossibility of further development of competencies on their own. There is only one solution in such a situation - the "acquisition" of the competencies of other manufacturers.

However, if there is a technical and personnel opportunity to develop the organization's competencies, preference can still be given to integration with partners on joint design and production of new products. The economic feasibility of a particular management decision is usually determined by costs.



When choosing the direction, method of development and transformation of personnel competencies, two criteria should be taken into account:

- the set and level of development of the competences of the organization's personnel, the availability of competencies potential and the possibility of exchanging experience;
- economic feasibility.

The development and transformation of personnel competencies, updating the profile of individual competencies can be carried out both by the organization's own efforts and through cooperation with partners. Options for updating competencies at the level of a particular organization are presented in various ways and forms: self-training, self-development, on-the-job training, mentoring. A feature of the training and retraining of personnel by the enterprise's own resources is the exchange of experience between employees and the expansion of the profile of competencies during the performance of production tasks and job duties, when more experienced and competent employees transfer knowledge and skills to young specialists in order to develop applied professional competencies.

The composition of the costs for the development and transformation of the intellectual component of the organization's competencies

For high-tech enterprises engaged in the production of technically complex innovative products, a significant share in the structure of the organization's competencies is occupied by the intangible component, represented by rights arising from patents for inventions and industrial designs, from utility model certificates; rights to software products, know-how and other results of intellectual activity. Changing the requirements for an innovative product involves not only expanding and complicating its functionality, but also ensuring novelty, exclusivity and uniqueness. The presence of a powerful scientific and technical base and production secrets at the enterprise provides the possibility of creating technically complex innovative products, on the one hand, and a high level of competitive advantages, on the other. But updating the requirements for a high-tech product can happen much faster than getting results from the company's own research and development activities and technological capabilities. The only way out in such a situation is to use the results of scientific and intellectual activities of another manufacturer on the terms of cooperation and partnership.

The intellectual component of the organization's competencies can be formed and subsequently changed by registering patent rights for inventions, utility models and industrial designs; development and use of the latest technologies in the production process; observance of confidentiality of information about the results of intellectual and research activities. In a situation where it is impossible (technological, organizational, economic) or inappropriate to bear the costs of creating and developing the intellectual component of the organization's competencies on its own, access to the results of intellectual and research activities of partner organizations can be obtained through the purchase of the required software products, technologies, methods, etc. .p., obtaining licenses or organizing joint work on the implementation of innovative projects, when the competencies of partners are combined while maintaining their independence and preserving the unique key competencies of each participant (Fig. 5).



Conclusions

The development and transformation of the organization's competencies can be carried out by the enterprise's own efforts and through interaction with partners through distributed design and production of technically complex innovative products. The choice of the direction of formation and transformation of the organization's competencies depends not only on the personnel, technical and scientific potential of a high-tech enterprise, but also on the composition of the costs for the development of all components of the organization's competencies: personnel, technical and technological, intellectual. From the point of view of time costs, of course, it is advisable to combine the competencies of individual manufacturers, rather than trying to create new technologies on their own, develop digital tools, improve the qualifications and competence of personnel, modernize and technically re-equip production, etc. Given the relevance of continuous updating of competencies for the functioning of a high-tech enterprise, the "rapid" development and updating of the organization's competencies becomes a factor in sustainability and competitiveness. Even from the standpoint of economic benefits, distributed production is more often preferable than expanding the areas of research and intellectual activity within a particular enterprise. Partners complement each other by integrating competencies, which contributes to innovative development and strengthening of competitive positions. However, it should be remembered that the acquisition of new competencies by combining with innovative partners not only provides significant benefits, but is also associated with certain risks: the difficulty of choosing a partner due to the lack of generally accepted methods and criteria for assessing the competencies of a partner organization; the need to protect the key competencies of each partner; the emergence of competition between partner organizations; reputational risk; loss of highly qualified personnel due to the transfer of leading specialists to a partner organization; lack of a mechanism for managing the competencies of high-tech enterprises.

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