

Measurement of the key capabilities of the company: approaches and methods

Olena Vartanova^{1, a, *}, Olena Kolomytseva^{2, b}

¹ Doctor of Economics, professor, Cherkasy State Technological University, Shevchenka av.,
Cherkasy, Ukraine

² Doctor of Economics, professor, Cherkasy State Technological University, Shevchenka av.,
Cherkasy, Ukraine

a. e.vartanova9207@gmail.com, b. e.v.kolomytseva@gmail.com

* Corresponding author

Keywords: approaches, competitive advantages, identification, diagnostics, measurement, key capabilities, methods, tools.

Abstract. In a globalized economy, the competitive advantages of modern companies are defined by the number of knowledge assets and organizational relationships which determines the uniqueness of the company in the market and its key capabilities. The article clarifies the meaning of the key capabilities of the company as a unique set of business processes and attributes of the company, which, combined with resources and technologies, are embodied into new products, processes and services with new consumer properties and provide competitive advantages. The authors conceptualized the process of identification and measurement of key capabilities of the company and emphasized that its main goal is to ensure the company's competitive advantages. The authors synthesized tools and methods for measuring the key capabilities of the company and showed the processes that require such measurement: business process modeling, competitive positioning of the company based on the analysis of capabilities, formation of a competitive strategy of the company, ensuring its competitive advantages.

1. Introduction

Information and technological revolution of the last quarter of the XX century greatly complicated the conditions of competition and became a powerful impetus for the transformation of the economic area of society. The new economy leads to the elimination of the geographical and national boundaries of the economic space, acceleration of the processes of information exchange, latest technological and managerial knowledge, liberalization of financial flows, increase of the competition pressure in order to penetrate new markets. High level of development of information and telecommunication technologies has accelerated the processes of implementation and dissemination, copying of new knowledge-intensive technologies and scientific developments by competitors. In these conditions, the competitiveness of a modern company, its role as an "intellectual leader" in the industry is increasingly defined by internal inimitable intangible resources, effectiveness of the use of intellectual and creative potential of staff, uniqueness of

organizational knowledge and technologies, which together form the key capabilities of the company.

Modern approaches to ensuring the competitive advantages of companies, managing their competitiveness, as well as some areas of strategic management are based on concepts of resource and competence approaches [1-4], which postulate the idea that sustainable, unique and inimitable competitive advantages are based on the combination of non-material factors of success - key capabilities, unique for the company.

We view key capabilities as a set of business processes and attributes (knowledge, experience and organizational relationships), unique for each company, that, combined with resources and technologies, are implemented into new products, processes and services with new consumer properties and provide the competitive advantages. By definition, key capabilities of the company are formed based on a combination of mostly intangible resources - knowledge, experience, organizational relationships, know-hows, etc. That is why some of the most difficult business processes are their identification and diagnostics. This leads to methodological and instrumental provision of diagnostics of the key capabilities of the company becoming an extremely important task of strategic management.

Realization of the set goal requires solving the following tasks, which are presented in the article:

1. Clarification of the definition of concept "key capabilities of the company" and its relation to other concepts of the subject field;
2. Conceptualization of the process of identification and measurement of key capabilities of the company;
3. Determination of the main stages and priorities of the process of measuring the key capabilities of the company;
4. Systematization of the methods of measuring key capabilities of the company;
5. Identification of the key capabilities of companies.

2. Manuscript Preparation

Despite attempts by scientists to identify the key capabilities, competencies and their components, the practical application of the results of these studies remains illusory. For example, Kevin P. Coyne, Stephen J. D. Hall, Patricia Gorman Clifford in the article "Is your core competence a mirage?" expresses the following: "Core competence is clearly an important concept, and some companies seem to be able to make it work. But for most, it's like a mirage: something that from a distance seems to offer hope in a hostile environment, but that turns to sand when approached. Why do competences seem so elusive? One reason may be that there is no clear basis for identifying them, nor any established way of gauging progress toward them" [7]. Therefore, the methodology of identification and measurement of key capabilities of the company is still at the stage of its formation, which defines the relevance of further research in this area.

Formation of the measurement tools of key capabilities of the company involves, first of all, the definition of the key terms: identification, evaluation and diagnostics.

Identification of the key capabilities involves relating the detected attributes of the key capabilities to their dominant features, which enables recognition of such attributes as the key capabilities of the company.

Assessment of the key capabilities involves measuring them based on the certain indicators, methods and tools, which help to identify the level of development of the key capabilities of the company.

Diagnostics of the key capabilities of the company is the process of recognizing the problem and classifying it using the accepted terminology, that is, the diagnosis of an abnormal state of the

phenomenon under investigation. Diagnostics of the key capabilities involves their identification, as well as assessment.

As a basic research method, we use critical, semantic and comparative analysis to identify the key company capabilities, as well as the results of our own research, expert surveys and expert sessions to form an instrumental basis for diagnosing key business abilities.

The methodology for identifying and measuring the company's key capabilities in the scientific sources, mostly foreign, is still at the stage of its development. For example, Henderson R., Cockburn I. believe that the practical measurement of the competencies and key capabilities can be done using different approaches, for example, based on the assessment of the impact of intangible assets on performance indicators of the company [8].

Other authors consider development of key competencies at the level of individual companies (Leonard-Barton, D. [9]) and at the level of their own hands-on experience (Henderson R., Cockburn I.) in an attempt to link the internal firm and industry analysis [8]. However, it should be noted that industry analysis, as well as the level of the industry efficiency, will not always achieve the desired goal, because the sources of the key capabilities lie in the company's internal environment, namely, in the unique set of business attributes (knowledge, skills, experience and organizational relationships) of each enterprise, which, in combination with the resources and technologies, determine the company's ability to produce highly competitive products, processes or services and provide its competitive advantages.

Ukrainian scientists Verba V. and Grebeshkova O. ("Problems of the company's competence identification [10]" and "Diagnostics of the company's competencies [11]") made significant contribution to the methodology of the measurement of the company's (which can be used to measure the company's capabilities). They offered their vision of diagnosing the competencies of the enterprise, which they understand as "the establishment and study of the features that characterize the state of the competencies system of the enterprise in their hierarchical connection to predict possible deviations and prevent the disruptions of its normal state ("normal" refers to the state of operation of the enterprise, that allows to create new (or maintain acquired) competitive advantages on the basis of compliance with the internal balance of competence formation of different hierarchical levels)" [11]. The authors propose to conduct the diagnostics of the competences in five stages: formation of the target model of the company's competencies; identification of the existing competencies; determination of whether the existing competencies of the target model profile match; creation of the development programs (formation, support, attraction of the competences, implementation of the protection mechanisms) [10].

Malyarchuk O. presents the methodical tool for identification of key capabilities of the company [12]. The methodology for identifying the key capabilities involves determination of the initial strategic position of the company based on a comprehensive assessment of its performance indicators (SPACE-analysis), evaluation of the enterprise resources by criteria: value, rarity, imitability and organization (VRIO-analysis method, supplemented by an integral indicator of the strategic status of the company's resources (Sr)), compilation of assessment profiles of the existing competencies in the fields of innovation and investment activities, partnership interaction and strategic foresight (surveys with the purpose of determination of the competence, paired comparison method for identification of the competencies to assess their level of development), identification of available configurations competencies that form key capabilities (expert assessment positive and negative effects when determining the level of development capacity). This approach makes a significant contribution to the practical application of the concept of the key capabilities of the company by developing a practical tool for their identification and diagnostics [12].

Russian scientists Efremov V. and Khanikov I. in their work "Key Competence as an Object of Strategic Analysis" (2002) emphasize the priority of the organizational factors in strategic analysis

of the company and offer their own system of strategic analysis of the competence of the company, which they define as "competence of the higher order involved in creating the highest consumer value, that is a collective knowledge that allows to organize and manage the use of other competences and abilities, thus creating an additional consumer value"; the authors define the company's capabilities as the business processes inherent in the business system [13]. The purpose of this analysis is to create a new base for a strategic plan, which, when implemented, will lead to sustainable competitive advantage, as well as to assess the potential of this plan from the standpoint of the financial position and capabilities of the company or business system as a whole. The proposed by the authors' analysis of the company's competences is based on the determination of the structure of connections and interdependencies among the existing resources, capabilities and competencies, inherent in the business system, as well as identifying the capabilities and resources involved in the manufacturing of the product, their contribution to the creation of final consumer value. Thus, the analysis of the company's competencies is based on the definition of business processes (capabilities) that create the maximum share of the consumer's value and resources involved in it. The proposed approach by Efremov V. and Khanikov I. to the analysis of competencies, capabilities and resources, determination of their effective configuration based on the calculation of the weighted average value of the degree of "engagement" of resources in the implementation of certain competences and capabilities, weighted by the degree of "implementation" of these resources in each specific property the product enriches the methodological base for analyzing and measuring the key capabilities of the company [13].

The important criterion of the availability of key capabilities of the company and their effective application and development is the present competitive advantage. Since the key capabilities are embodied in the added value of goods and services, they are also directly related to the creation of competitive advantages.

3. Methodology

The analysis of approaches to the diagnostics of the key capabilities of the company, presented both in domestic and foreign scientific sources, has enabled us to formulate the conceptual foundations for the measurement of the key capabilities of the company. The concept of measuring the key capabilities lies in the identification of the whole set of knowledge assets, business processes and key attributes of business that can potentially transform into competitive advantages, determination of their location, carriers, and methods of analysis. Based on their general concept of measuring the key capabilities in all of their diversity and multidirectional impact on the company's competitive advantage, the goals of measuring the key capabilities are determined, according to which the methods for their analysis, measurement and diagnostics are selected. The ultimate goal of measuring the key capabilities is to identify a list of capabilities that affect the company's competitiveness and provide an opportunity to secure its competitive edge. Conceptualization of the process of measuring the key capabilities of the company is presented on Fig. 1.

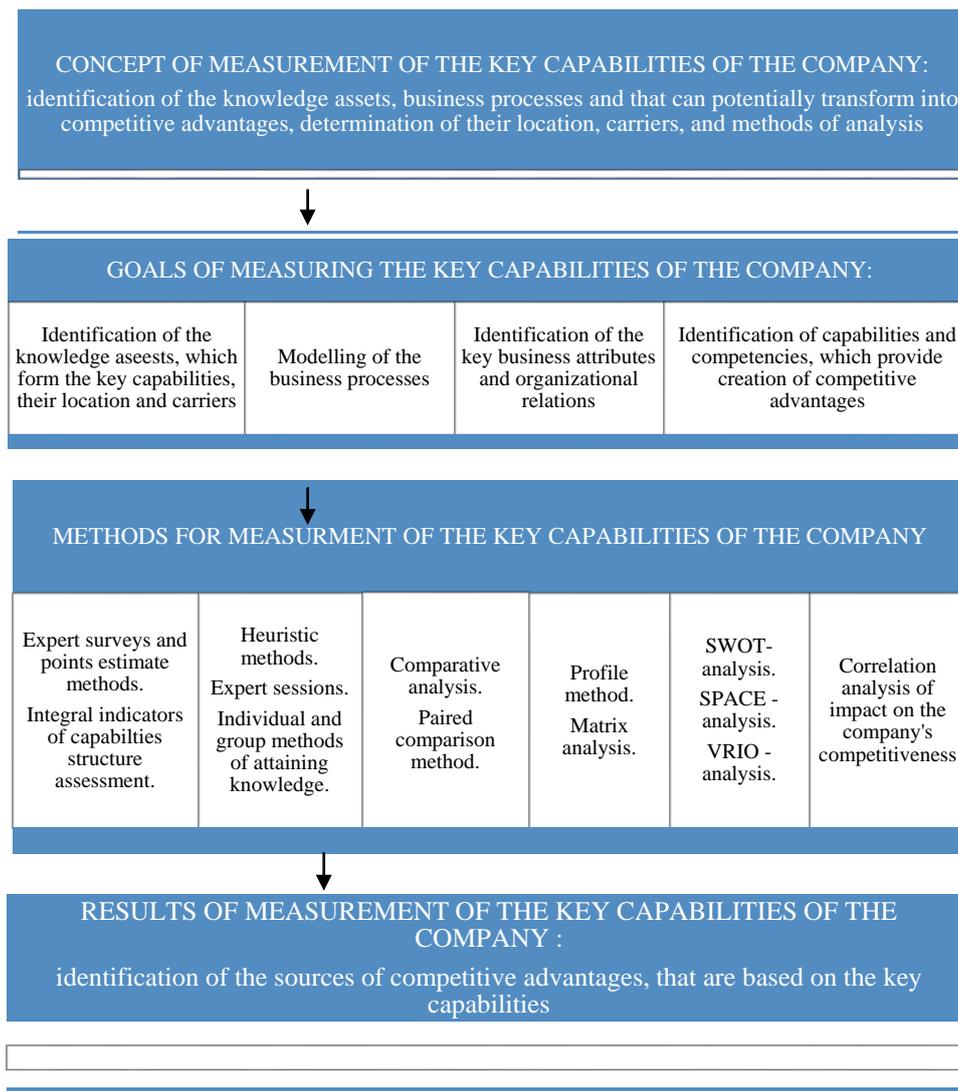


Figure 1 Conceptualization of the measurement process of the key capabilities of the company
Source: own research

According to the conceptualization of the key capabilities of the company, the goal is to create a list of the key capabilities, organizational relationships and other business attributes that ensure the company's competitive advantage. We have proposed a list of methods and tools for measuring the key capabilities of the company, which become the instruments in the successful execution of the process (Table 1).

Table 1 Sequence and toolkit for measuring the key capabilities of the company in the context of providing competitive advantage

| Stage | Characteristics | Methodological toolkit |
|--|---|--|
| Stage 1. Identification of the key attributes which form the company's capabilities. | Identification of the knowledge assets, business attributes and organizational relations, which potentially can form the key capabilities of the company. Assessment and ranging of the identified attributes. Determination of | Expert assessment methods. Points methods. Individual and group methods of attaining knowledge. Expert sessions. Scaling. Ranging method. Profile building method. |

| | | |
|--|---|---|
| | the competences' clusters, which are important for the provision of the competitive advantages of the company. Determination of the effective structure of the capabilities based on the specific competences' clusters | Integral indicator of measurement of the company's capabilities |
| Stage 2. Modeling of business processes and identification of the key resources, which provide the creation of the competitive advantages. | Assessment of the company's resources (material, human, information, intellectual, financial) based on the features of the key capabilities (sustainability, inimitability, rarity) | VRIO-analysis, SWOT-analysis, SPACE - analysis. Integral indicator of the strategic worth of the company's resources. Profiles method |
| Stage 3. Competitive positioning of the company based on the level of the development of the key capabilities | Determination of the company's initial competitive position based on its capabilities and comparative analysis | Matrix method. Profiles method. Comparative analysis. Integral indicators of the company's capabilities |
| Stage 4. Determination of the effective structure of the capabilities, required for the provision of the competitive advantages of the company | Formation of the assessment profiles of capabilities of the company, which correspond to key areas of competence. Formation and selection of the strategic directions for development of the key capabilities of the company. | Expert surveys. Comparative analysis. Paired comparison method. Ranking of the capabilities. Calculation of the integral indicator to identify the most effective configuration of the company's capabilities |

* Source: own research

4. Results

The developed methodology of measuring the key capabilities of the company tested on the data from the machine-building enterprises of Cherkasy region: OJSC "Smiliansky Machine Building Plant", PJSC "SPE "Smilyansky Electromechanical Plant" and PJSC "Cherkasy Instrument Manufacturing Plant". PJSC Cherkasy Instrument Manufacturing Plant produces heaters for bus interiors, electric signaling devices, electric motors and generators, provides services on mechanical processing of metal products. OJSC "Smiliansky Machine Building Plant" produces equipment for the food and chemical industry, and railway transport enterprises. PJSC "SPE "Smilyansky Electromechanical Plant" produces components and details to electric motors and generators and provides services for their repair. The purpose of the study was to identify and assess the key capabilities of machine-building companies.

The main task of the first stage (identification of key capabilities) is identification of all assets and organizational relationships that are potential for forming the key capabilities of the company. In order to achieve this, we used one of the methods of expert sessions - "Method 635", which is a special kind of brainstorming. The peculiarity of this method is the following: a group of six participants analyses clearly stated problem. The method forms three "waves" of problem solving by identifying three proposals for solving a given problem and passing it on to another expert to

provide suggestions that can already be used as decision-making associations as well as the basis for new proposals. As a result of conducting expert sessions, based on the generalization of expert opinions, a list of companies' capabilities was formed and weaknesses in the formation of the capabilities were identified (Figure 2).

The list of capabilities of the studied companies is not yet final, because, by definition, the key capabilities are a set of business processes and business attributes that generate new consumer properties of the product and provide competitive advantages, unique for each company. We suggest the evaluation of the uniqueness of the capabilities according to the codification criteria (the degree of knowledge codification is estimated from 0 to 6, the unique knowledge is uncoded (the score is 0) and diffusion (the degree of knowledge prevalence is estimated from 0 to 6, unique knowledge and technology are not diffused (0 score)).

Obviously, from the list of the identified capabilities of the investigated companies, only those with relatively low levels of codification and diffusion can be considered the key ones. At the same time, we believe that the differentiation of key capabilities based on the evaluation of the level of knowledge codification and diffusion should not exceed the corresponding values of 2 ("two"), that is, the knowledge codified not higher than: "May be shown and described orally" and differentiated not higher than: "Known to a small number of enterprises in several industries". The results of evaluation of the company's capabilities in terms of codification and diffusion are presented in Fig. 3-5 (capabilities are ranked by the level of codification and diffusion, horizontal scale depicts the capability for their ordinal numbers, vertical scale – the scores of capability's assessment).

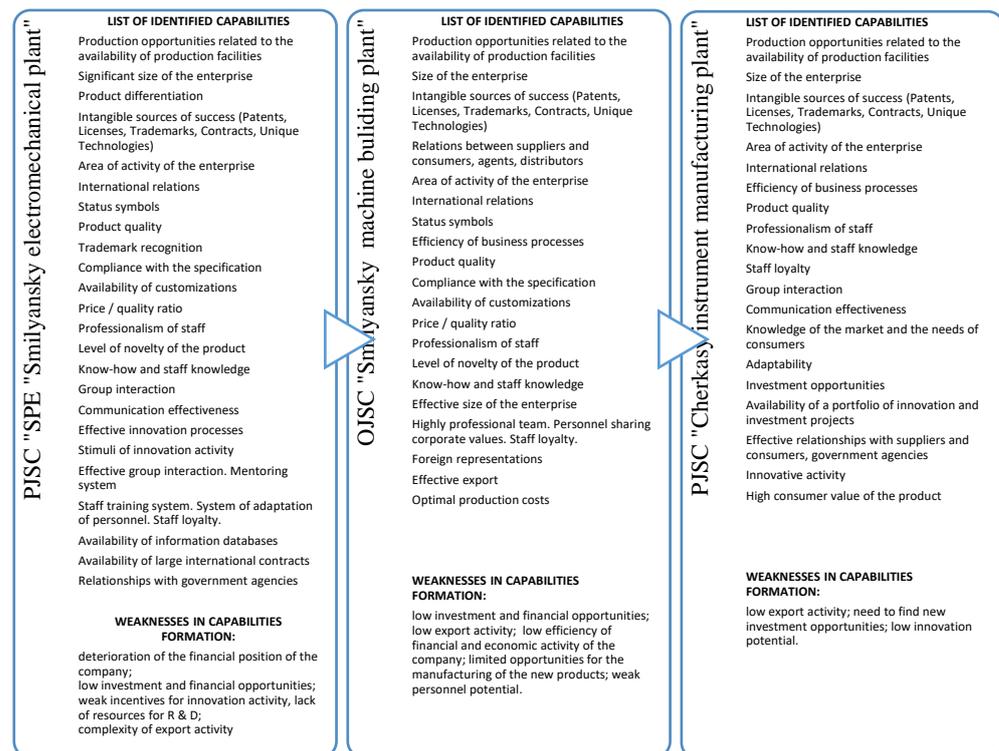


Figure 2 List of identified capabilities and weaknesses in the formation of capabilities of studied companies

Source: own research

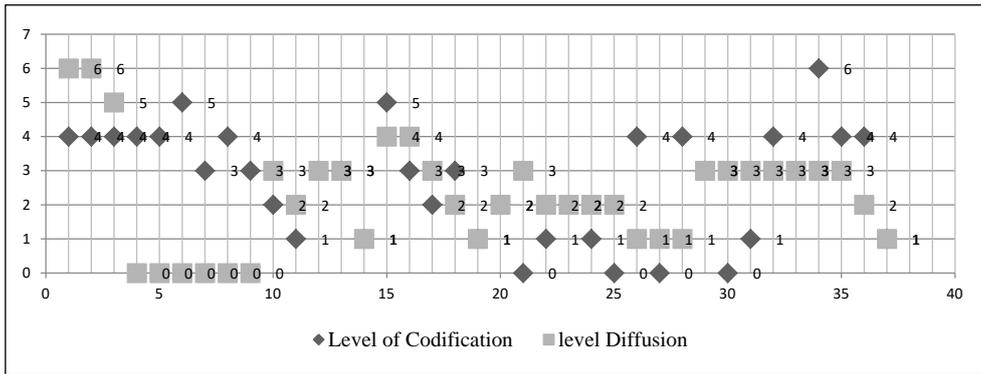


Figure 3 Assessment of the capabilities of PJSC "SPE "Smilyansky Electromechanical Plant" based on the level of codification and diffusion

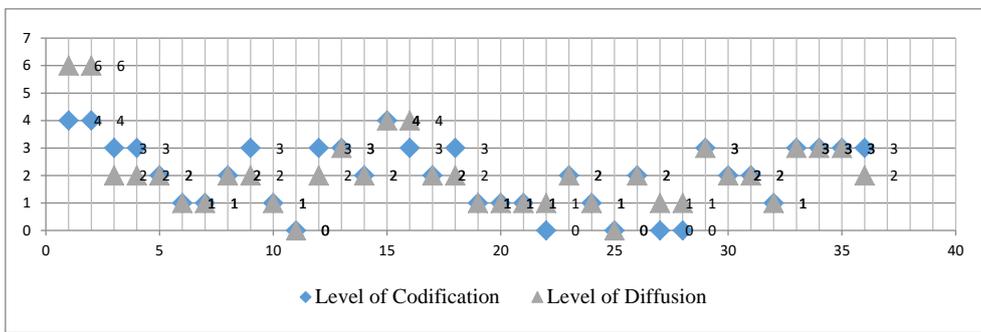


Figure 4 Assessment of the capabilities of OJSC "Smilyansky Machine Building Plant" based on the level of codification and diffusion

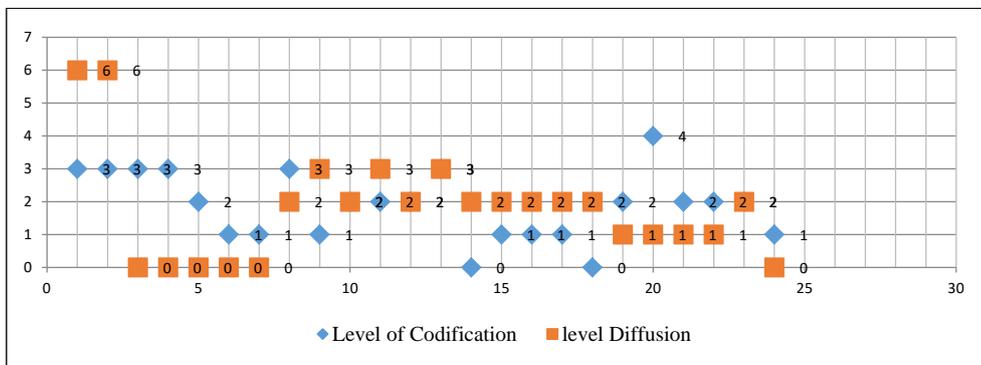


Figure 5 Assessment of the capabilities of PJSC "Cherkassy Instrument Manufacturing Plant" based on the level of codification and diffusion

As a result of the assessment, the key capabilities of PJSC "SPE "Smilyansky Electromechanical Plant" are the following: 6-8, 10-11, 17, 19-26, 30-32 capabilities. For OJSC "Smilyansky Machine Building Plant" – 6-8, 10, 11, 19-28, 30-32. For PJSC "Cherkassy Instrument Manufacturing Plant" – 5-7, 9, 10-12, 14, 15-19, 20-24 capabilities. Thus, the identified capabilities of the enterprises, adjusted according to the codification and diffusion level, made it possible to identify the key capabilities of enterprises. The application of specific methods of measuring the key companies' capabilities enabled creation of matrix of the key business attributes of the investigated companies that are potentially able to form the key capabilities (identified capabilities are distributed according to the main features of their classification - regulatory, positional, functional, dynamic) (Table 2).

Table 2 Matrices of the key business attributes, which form the key capabilities of the studied companies

| Sources of capabilities/resources | | | |
|---|---|--|--|
| Regulatory capabilities | Positioning capabilities | Functional capabilities | Dynamic capabilities |
| <i>PJSC "SPE "Smilyansky Electromechanical Plant"</i> | | | |
| 1. <u>Production capacities</u> , which enable the company to achieve the leading position in terms of the production volumes 2. <u>Unique equipment</u> | 1. <u>Cost optimization</u> due to the use of energy-saving technologies | 1. <u>Provision of quality control</u> due to the use of special equipment | 1. <u>High consumer value of the product</u> |
| <i>Weaknesses of the capabilities' formation</i> | deterioration of the financial position of the company; low investment and financial opportunities; weak incentives for innovation activity, lack of resources for R&D; complexity of export activity | | |
| <i>OJSC "Smilyansky Machine Building Plant"</i> | | | |
| 1. <u>Investments in new equipment</u> , necessary for the maximum product value support | 2. <u>Investments in new equipment</u> , necessary for the maximum product value support | 3. <u>Investments in new equipment</u> , necessary for the maximum product value support | 4. <u>Investments in new equipment</u> , necessary for the maximum product value support |
| <i>Weaknesses of the capabilities' formation</i> | low investment and financial opportunities; low export activity; low efficiency of financial and economic activity of the company; limited opportunities for the manufacturing of the new products; weak personnel potential. | | |
| <i>PJSC "Cherkasy Instrument Manufacturing Plant"</i> | | | |
| 1. <u>Significant manufacturing capacities</u> , which enable to achieve leading position in terms of the production volumes | 1. <u>Opportunities to manage technological knowledge</u> (instead of development of new technologies) more effectively than competitors | 1. <u>Application of the opportunities of research training</u> (S-training) to search for the technological gaps and make quick technological changes | 2. <u>Development of internal processes and organizational relationships</u> , that enables quicker adaptation |
| <i>Weaknesses of the capabilities' formation</i> | low export activity; need to find new investment opportunities; low innovation potential. | | |

* Source: own research

5. Conclusion

The performed scientific research allows us to formulate the following conclusions:

1. Based on the conducted semantic, logical and contextual analysis, the authors formulated their own definition of the key capabilities of the company as a set of business processes and business

attributes (knowledge, experience and organizational relations) that are unique for each enterprise, which, in combination with resources and technologies, are implemented in new products, processes and services with new consumer properties and provide competitive advantages. According to the authors' conceptualization of the key capabilities' measurement, its purpose is to identify and assess the entire set of knowledge assets, business processes and key attributes of business, potentially capable to transform into the competitive advantages of the enterprise, their localization, carriers and methods of analysis. Depending on the tasks of measuring key capabilities, its required accuracy, the key processes of measuring key capabilities can be: identification, measurement, evaluation and diagnostics. These stages are arranged as the complexity grows and can be applied both separately and as a group, depending on the needs of the key capabilities' analysis.

2. The methodological toolkit for measuring the key capabilities of the company allows to clearly identify the needs of analysis of key capabilities: this may be ensuring competitive advantages of the company, competitive positioning of the company, formation of its competitive strategy, optimization of business processes, development of certain areas of competence of the company. However, in general, the main goal of measuring the key capabilities is to identify internal organizational sources of competitive advantages, which are formed based on key capabilities. Consequently, depending on the research needs, different methodological tools and sets of methods can be used to identify, assess or diagnose the presence and state of key capabilities of the company.

3. According to the research objectives, the authors synthesized a set of methods for measuring the key capabilities of the company, the purpose of which is the use of a broad set of tools for identifying, analyzing and assessing key capabilities of the company.

4. The developed methodology of measuring the key capabilities of the company was implemented on the data from the machine-building enterprises of Cherkasy region. The purpose of the study was to identify and assess the key capabilities of machine-building companies. With the help of expert sessions on the investigated enterprises using Method 635, the initial set of capabilities of the companies was created, which was further adjusted by assessing the identified capacities according to the criteria of the knowledge codification and diffusion level. This made possible to refine the list of the key capabilities of the companies under study and to build matrices of the key business attributes that form the key capabilities of the companies.

References

- [1] Barney, J. B., (1991) *Firm Resources and Sustained Competitive Advantage*. *Journal of Management*, 17 (1), 99-120.
- [2] Prahalad, C. K., Hamel, G. (1990) *The core competence of the corporation*. *Harvard Business Review*, Vol. 68 (3), 79-91.
- [3] Hamel, G., Heen, A. (1994) *The concept of core competence*. Chichester: Wiley, 1994, 80.
- [4] Hamel G., Prahalad, C. K. (1994) *Competing for the Future*. Harvard Business School Press, 1994, 180.
- [5] Kuznetsova, I.O. (2008) *Resource approach to enterprise development*. *Bulletin of the Khmelnytsky National University*. Khmelnytsk, 2008, 1(4), 79-81.
- [6] Vartanova, O.V. (2012) *Competence of the enterprise in strategic management of knowledge: formation and development*. Lugansk: Volodymyr Dahl East Ukrainian National University, 340.
- [7] Coyne, K.P., Stephen, J. D., Gorman Clifford, H., Gorman Clifford, P. (2007) *Is your core competence a mirage?* [online]. Available at: <https://carpenterstrategytoolbox.files.wordpress.com/2013/10/corecompetencemckinseyq.pdf>
- [8] Henderson, R., Cockburn I. (1995) *Measuring competence? Exploring firm effects in pharmaceutical research*. *Strategic Management Journal*, 15 [Special Issue], 63-84
- [9] Leonard-Barton, D. (1988) *Simplemmentation as mutural adaptaqtion and technology and organization*. *Research Polisy*, 17, 251-267.

- [10] Verba, V., Grebeshkova, O. (2004) *Problems of identification of competencies of the enterprise. Problems of science*, 7, 23-28.
- [11] Verba, V., Grebeshkova, O. (2007) *Diagnostics of the competence of the enterprise. Formation of market economy*, 18, 166-172.
- [12] Malyarchuk, O.G. (2013) *Assessment of the level of development of dynamic capabilities of enterprises: methodical principles and practical testing. Strategy of economic development of Ukraine. Kiev, KNEU*, 32, 131-139.
- [13] Efremov, V.S., Khanikov, I.A. (2002) *Key Competence of the Organization as an Object of Strategic Analysis. Management in Russia and Abroad*, 2, 8-33.
- [14] Teece, D.J. (2007) *Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal*, 28, 1319-1350.
- [15] Vartanova, O.V., Salita, S.V. (2013). *Ability of the enterprise: essence and distinctive features. Modern Fundamental and Applied Research*, 3 (10), 62-66.