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INNOVATION CULTURE AS THE BASIS FOR INNOVATIVE ENVIRONMENT OF THE ENTERPRISE

INNOWACYJNA KULTURA JAKO PODSTAWA DLA ŚRODOWISKA INNOWACYJNEGO PRZEDSIĘBIORSTWA

Abstract: The purpose of the article is to clarify the essence, content, structure and components of the innovation culture of the enterprise, the development of an approach to the diagnosis of its condition. A comparative, systemic-structural and statistical analysis were used to attain it. The author's model of the innovative culture structure of an industrial enterprise was offered. Problems in understanding of its role by middle and top managers of innovative industrial enterprises were outlined. The methodical approach to multifactorial diagnostics of the state of innovation culture of an industrial enterprise was developed and tested in general, as well as its separate components. The place of innovation culture of the industrial enterprise in the system of mechanisms of innovative environment formation was determined. The structural-logical scheme of the management mechanism of innovative environment formation and introduction at an industrial enterprise based on its innovation culture was developed.

Keywords: innovation culture, innovative environment, industrial enterprise, diagnostics of innovative culture

Streszczenie: Celem artykułu jest wyjaśnienie istoty, treści, struktury i składników kultury innowacyjnej przedsiębiorstwa, opracowanie na tej podstawie podejścia do diagnozy jej stanu. Do jej osiągnięcia wykorzystano analizę porównawczą, systemowo-strukturalną i statystyczną. Zaproponowano autorską opcję struktury kultury innowacyjnej przedsiębiorstwa przemysłowego. Określono problemy w zrozumieniu jej roli przez kierowników średniego i najwyższego szczebla innowacyjnie aktywnych przedsiębiorstw przemysłowych. Opracowano i przetestowano podejście metodyczne do diagnozy wieloczynnikowej stanu kultury innowacyjnej przedsiębiorstwa przemysłowego: ogólnie, jak również poszczególnych jej komponentów i ich elementów. Wyznaczono miejsce kultury innowacyjnej przedsiębiorstwa przemysłowego w systemie mechanizmów kształtowania innowacyjnego środowiska. Opracowano schemat strukturalno-logiczny mechanizmu zarządzania tworzeniem i wprowadzaniem innowacyjnego środowiska w przedsiębiorstwie przemysłowym w oparciu o jego kulturę innowacyjną.

Słowa kluczowe: kultura innowacyjna, środowisko innowacyjne, przedsiębiorstwo przemysłowe, diagnostyka kultury innowacyjnej

Introduction

The current stage of the global economy is characterized by the growing role of intangible factors. They increasingly determining the rate of growth of individual organizations (companies and enterprises) and the national economy as a whole. Leading positions in global markets, providing high living standards occupy countries that have made reliance on the information and knowledge embodied in new products, production technology, production management and marketing, organization of society in general, etc. They are distinguished by a favorable innovative environment based on innovation culture as a sociocultural mechanism of innovative behavior. According to modern concepts the innovation culture is considered on two levels: national and the level of a separate organization. Practice shows that success in innovation and forming a supportive environment can only be gained at both levels of interaction agreed. This applies particularly to industry, including engineering, which largely affects the pace and direction of technological progress in various fields of economic activity.

Analysis shows that a wide range of scientific publications is devoted to the management of formation and development of enterprise's innovation culture. Soren Kaplan¹ reveals approaches to transforming the traditional organizational structure of the organization into innovative. Jay Rao and Joseph Weintraub² set out common approaches to the definition of innovation culture of the organization, its structure, evaluation and development. A. Vikarchuk³ explores the evolution of the concept, meaning and essence of innovation culture of the company. S. Handi⁴ and E. Shane⁵ examined the types of organizational cultures enterprises and institutions.

The formation of innovation culture in terms of its innovative potential is explored by L. Patora, N. Tsymbalista⁶. C. Kazmirchuk⁷ investigates basic principles and objectives of the formation of an effective innovation culture of the company. E. Larichev⁸

¹ S. Kaplan, *Creating a Culture for Innovation: Driving Innovation through Strategic Changes to Organizational Culture* [electronic resource] – Access: http://www.1000advice.com/guru/innovation_culture_sk.html.

² The development of an enterprise innovation culture [electronic resource] – Access: <http://constructorus.ru/uspex/razvitie-innovacionnoj-kultury-predpriyatiya.html>.

³ A.I. Vikarchuk, *Evolution of innovative culture forming. Sustainable Economic Development*, 2013. - № 3 (20). - p. 310-314.

⁴ Types of enterprise culture by C. Handy [electronic resource] – Access: <http://www.hr-portal.ru/pages/okk/tko.php>.

⁵ E. Shane, *Organizational culture and leadership*. 3rd ed.: Pere with English. / ed. T.Y. Kovalevov – St. Petersburg: Peter, 2007, p. 336.

⁶ L. Patora, N. Tsymbalista, *Innovation culture Formation as a basis for an enterprise innovative potential development*. Problems of Economics and Management: Bulletin of NU “Lviv Polytechnic” 2008, no. 628, p. 603-608.

⁷ C. Kazmirchuk, Innovation culture, its the role and place in the innovative development of an enterprise, “Socio-economic Problems and the State” 2010, Issue 1 (3), p. 66-70.

⁸ E.A. Larichev, *Innovation culture development at the enterprise*, “Bulletin of the Bryansk Technical State University” 2009, no. 2(22), p. 128-133.

offers general scheme of forming innovation culture of the company. G. Zaharchyn, A. Andrychuk⁹ develop approaches to modeling the innovation culture of the company. K. Cameron, R. Queen¹⁰ highlights approaches to diagnosing the organizational culture.

B. Hrechanyk¹¹ highlights the role of the enterprise's innovation culture in formation of its innovation climate. V. Zubenko¹² developed principles of organizational and economic mechanisms of the enterprise innovation culture.

However, the absence of common views on the composition and structure of the enterprise's innovation culture complicates determination relationships and interaction between its elements and the innovation culture of the State, as well as other mechanisms of innovation regulation and fostering, which together form the innovative environment.

Thus, the aim of the paper is to clarify the nature, content, structure and components of the enterprise innovation culture, elaborate approaches to the diagnosis of its condition in order to develop activity complex to create an innovative environment.

1. Components and structure of enterprise's innovation culture, their interaction

System analysis and synthesis of the literature (see. Introduction) and management practices lead to a definition of "Innovation culture of the enterprise", defined its subsystems and their components.

Innovation culture of the enterprise – is an integral part of its corporate culture (which, in turn, is the part of the intellectual capital of the company¹³), characterizing the conduciveness of individual employees, groups of employees (units) and the enterprise as a whole to create a perception, distribution and commercialization of innovations their implementation in new products, technology, management solutions. In today's economy, instable and permanently changing its conditions, innovation culture is one of the main factors for enterprise's adaptation to these changes and maintaining a high level of economic security¹⁴.

Innovative enterprise culture includes:

⁹ G.M. Zaharchyn, O.J. Andrychuk, *Conceptual model an enterprise innovation culture*, "Science Journal NLTU Ukraine": Coll. scientific-technical works, Lviv, Ukraine NLTU 2008, vol. 18.8, p. 272-278.

¹⁰ K.K. Cameron, R. Queen R. *Diagnosis & changes in organizational Culture*, translation I.A. Andreeva, St. Petersburg 2001, p. 320.

¹¹ B.V. Hrechanyk, *Innovation culture of an Enterprise as a prerequisite for of its innovative climate* [electronic resource] – Access: <http://ena.lp.edu.ua:8080/bitstream/ntb/18356/1/15-Hrechanyk-26-28.pdf>.

¹² V.V. Zubenko, *Organizational and economic mechanism of an enterprise innovation culture*, PhD paper: 08.00.04, Donetsk Institute of Industrial Economics of NAS of Ukraine 2011, p. 206, <http://iep.donetsk.ua/news/contens/251111-2.pdf>.

¹³ S.M. Illyashenko, Y.S. Shipulina, *Factor analysis of an enterprise innovation culture state*, *Economic Annals -XXI*, 2014, no. 3-4, p. 31-34.

¹⁴ Y.S. Shipulina, N.S. Illyashenko, *Optimization of an enterprise innovation culture from the standpoint of ensuring its economic security*, "Marketing and Management of Innovation" 2015, no. 2, p. 159-169.

- The organizational component that characterizes innovative organizational structure and organizational (corporate) culture of the company, their orientation to create favorable conditions for effective creative work of each employee and staff in general, it provides mutually creative collaboration;

- Motivational component that motivates and stimulates highly effective personnel activity for creation, perception and distribution of innovation;

- Intellectual and creative component, which focuses on the most complete disclosure of creative innovation potential of the personnel, commitment to the growth of this both individual and group potential (a separate unit or organization as a whole).

Based on this theoretical framework Shipulina Y.S. studied the perceptions of top and mid-level managers of 12 (3 large and medium – 9) innovatively-active industrial enterprises of the Sumy Region concerning the role and place of innovation culture (its individual components) in ensuring the success of innovative activity¹⁵. Analysis of the results showed that 25% of respondents noted the role of all components (organizational, motivational, intellectual and creative); 33% – allocated a key role of organizational component; 33% – intellectual and creative; 9% – indicated that they could not answer clearly. Moreover, all respondents noted the important role of innovation culture for development of innovative activity of their enterprises. 91.7% of them claimed that it directly influences innovative environment and innovative activity, and 8.3% stated its indirect influence. 100% of respondents indicated the presence of innovation culture at their companies, and that they stimulate activities aimed at its development.

Further analysis showed that the majority of enterprises (66%) implement activities only promoting organizational component of the innovation culture, the rest (34%) – develop the organizational and motivational components. However, in none of the companies attention is paid to the intellectual and creative component of the innovation culture.

Analysis of the survey shows that the managers of the analyzed companies correctly understand the role of innovation culture as an enhancing factor for innovations. However, there are some problems that need to be resolved. They include:

– Business management's indistinct understanding of the essence of innovation culture;

– Weak understanding of the structure of the innovation culture and its subsystems' elements;

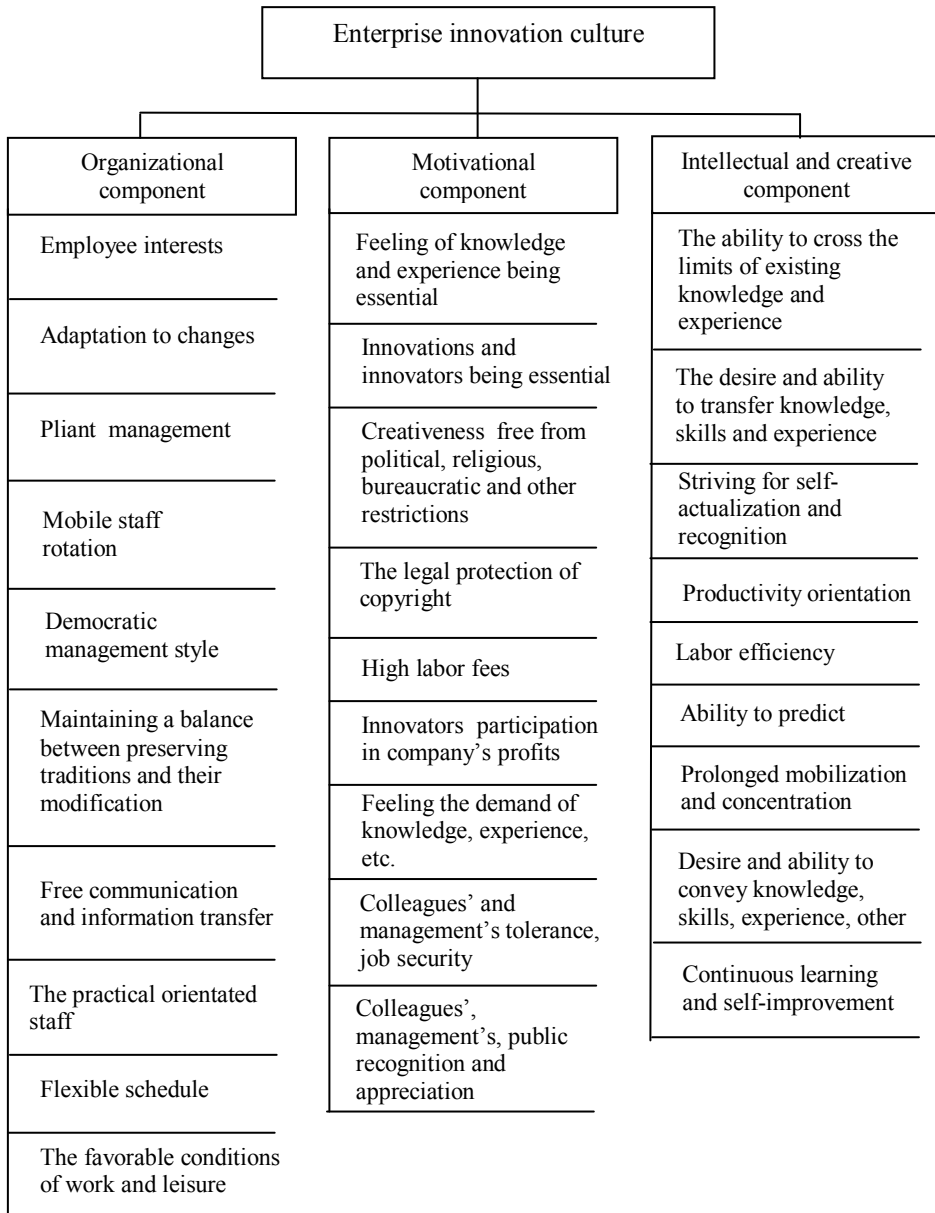
– Lack of effective practical methods of diagnosis of the company's innovation culture state;

– Lack of instruments and methods for managing the development of innovation culture.

¹⁵ Y.S. Shipulina, *Problems and prospects of formation and development of innovation culture, "Efficient Economy" 2015, no. 9.*

The proposed structure of the enterprise innovation culture (Fig. 1) is based on the results of a critical analysis of the literature (see: Introduction).

Figure 1. The components of enterprise innovation culture
Rysunek 1. Elementy kultury innowacyjnej przedsiębiorstw



Source: own elaboration.

Taking into account the nature of components and elements indicated in Fig. 1 the following scheme (Fig. 2) reflects the sequence of formation of an enterprise innovation culture.

According to Fig. 2 the staff’s innovative abilities form the basis for innovation culture. The organizational component provides mutual cooperation, motivational component encourages effective activity on the creation and distribution of innovation, intellectual and creative component directs staff to full disclosure and growth of its creative potential (innovation capacity).

Hence the development of enterprise innovation culture is cyclical: the staff’s innovative ability → organization → motivation → innovative ability. Then the cycle is repeated, but at a new level.

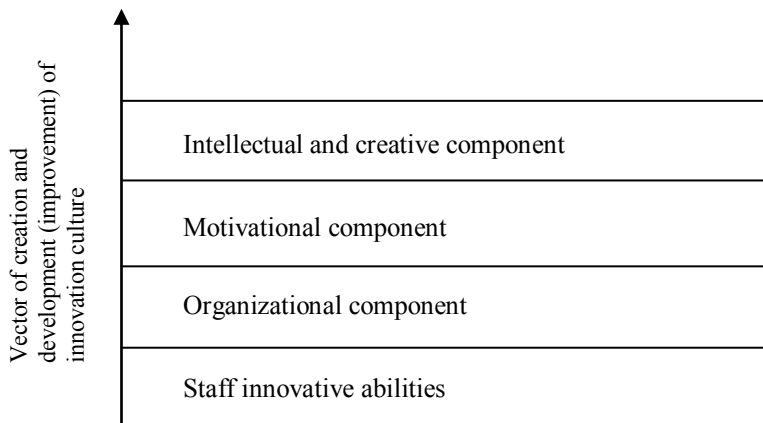
To diagnose the company’s innovative culture authors proposed to use the three-component index that characterizes the level of individual components

$$I_i = f(I_o, I_m, I_{ic}) \quad (1)$$

where I_i - index of enterprise innovation culture in general; I_o, I_m, I_{ic} - respectively, indexes of organizational, motivational, intellectual and creative components of the innovation culture of the company.

Figure 2. Scheme of formation of innovative enterprise culture

Rysunek 2. Schemat tworzenia kultury innowacyjnej przedsiębiorstwa



Source: own elaboration.

2. Principles of diagnostics of enterprise innovation culture

Indicators I_o, I_m, I_{ic} are defined as the average estimates of elements of relevant components, such as a 10-point scale. Estimates of individual items (see. Fig. 1) are proposed to perform by expert review, it is recommended to involve leading experts and managers of the analyzed company and other individuals (representatives of con-

tractors and contact audiences, academics, etc.). For diagnostics of individual components and enterprise innovation culture in general the authors proposed¹⁶ to use the scale designed on the Pareto principle (20/80), and the ABC analysis scale (50/80/100):

- $0 \leq I_i \leq 5$ (low);
- $5 < I_i \leq 8$ (average);
- $8 < I_i \leq 10$ (high).

Based on mentioned above the following levels of enterprise innovation culture and corresponding management activity of its formation and development can be defined:

1) I_i is high, if the components' figures are within $8 < I_i \leq 10$, it is assumed that one of them may be within $5 < I_i \leq 8$; Administrative activity is to maintain the achieved level and to response to changing external conditions;

2) I_i is average, if the components' figures are within $5 < I_i \leq 8$, it is assumed that one may be within $8 < I_i \leq 10$; Administrative activity includes improvement of components and comparison with the innovation culture of main competitors and introduces appropriate adjustments;

3) I_i is low if the components' figures are within $0 \leq I_i \leq 5$, it is assumed that one may be within $5 < I_i \leq 8$ or $8 < I_i \leq 10$; Administrative activity includes interventions to improve the level of priority components, ideally - all.

Table 1 shows a fragment of innovation culture diagnostic of 3 enterprises of Sumy Region, Ukraine, operating in various fields. Calculations of indexes I_o , I_m , I_{ic} as well as average estimates of their elements (see Fig. 1) are omitted. As a result of the diagnosis a set of activity aimed at improving innovation culture was formed for each of the companies, these activity were detailed for individual components and elements.

Table 1. Diagnostic of the enterprise innovation culture
Tabela 1. Diagnostyka kultury innowacyjnej przedsiębiorstwa

Activity field	indexes			
	I_m	I_o	I_{ic}	I_i
Engineering company	5,68	6,09	6,78	Average level
Engineering company	6,03	7,13	7,67	Average level
IT company (branch of a global company)	8,5	9,01	8,76	High level

Source: own elaboration.

3. Place of the enterprise innovation culture in the system of mechanisms of formation innovative environment

The scheme of management of mechanisms of innovative environment formation at the enterprise is presented in Fig. 3. It gives an idea about the role of innovation culture in the management of the innovation process at an individual enterprise.

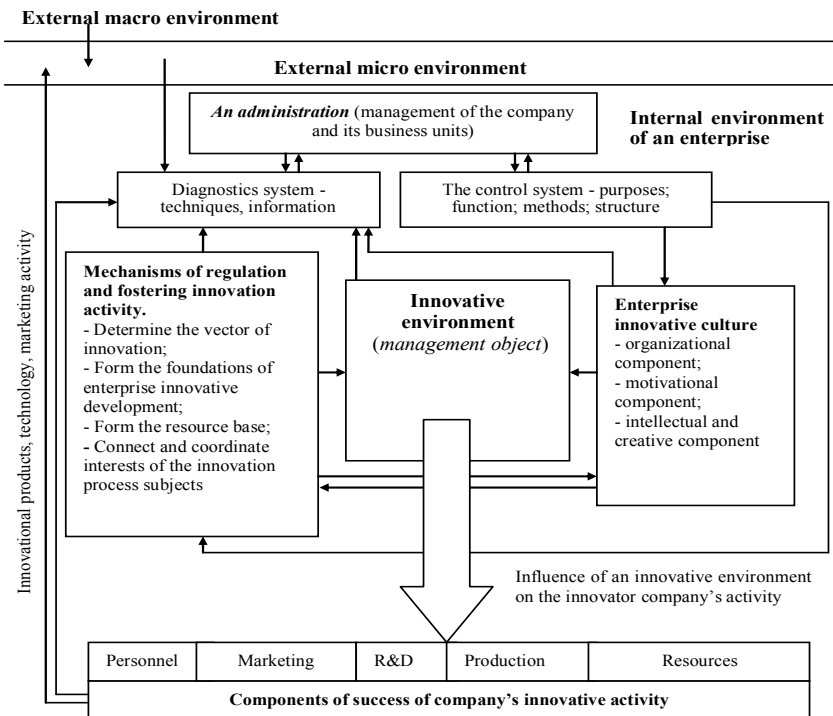
¹⁶ N.S. Ilyashenko, *Organizational and economic bases of innovative marketing of industrial enterprises*: Monograph. - Sumy "SSU Publishing" 2011, p. 192.

As follows from the scheme in Fig. 3 the formation of innovative environment at the company is influenced by factors of macro environment (market mechanisms, mechanisms of State stimulation and regulation of innovation, State innovation culture, etc.), as well as micro environment: economic counterparties activity (customers, agents, suppliers, financial institutions and etc.) and contact audiences (media, local communities, local authorities, etc.). Macro factors are objective, or unmanageable. They demand adjustments using only favorable opportunities. Their influence is mainly indirect, and they are regarded as some set of market opportunities and threats. They also affect the innovator company by factors of microenvironment, strengthening or weakening their activity.

In terms of an individual enterprise main components of innovative environment are mechanisms of regulation and fostering innovation indicated in Fig. 3, and innovative culture. These mechanisms are well-known¹⁷, they form the foundations for innovative development of a particular company from aligning its internal development capabilities to external generated by the market.

Figure 3. Structure and logic scheme of integrated management mechanism of the formation and development of innovative environment at an enterprise

Rysunek 3. Struktura i schemat logiczny zintegrowanego mechanizmu tworzenia i rozwoju środowiska innowacyjnego w przedsiębiorstwie



Source: own elaboration.

¹⁷ Y.S. Shipulina, *Innovation culture as a part of innovative environment at the modern enterprise. Innovations in marketing and management: monograph* / ed. S. Ilyashenko, Sumy LLC Printing house "Papyrus" 2013, p. 132-140.

Innovative environment directly affects the components of innovation success - quality and efficiency of the staff in creation and distribution of innovations, including scientific research and development (R&D); marketing support for innovations, creation and implementation of marketing innovation; organization and production of innovative products; efficient use of resources, etc.

The scheme describes the place and role of enterprise innovation culture in formation of a favorable environment for innovation. It also reflects the conceptual principles and approaches to control the formation and development of innovative environment at an enterprise, based on its innovation culture.

Conclusions

Summing up we can draw the following conclusions:

1. The definition of “innovation culture of the enterprise” was specified as well as the essence and the concept of its subsystems and their elements. The author’s view at its structure was proposed. This allowed to define precisely the sequence of formation of enterprise innovation culture and hence effectively manage the process of its formation.

2. Based on this theoretical framework the perceptions of top and mid-level managers of innovatively-active industrial enterprises of the Sumy Region concerning the role and place of innovation culture in their innovative activity were studied. Results of the study allowed to define problems and prospects of an effective mechanism of formation of innovative environment for industrial enterprises based on their innovation culture.

3. Authors proposed the methodical approach to multi-factorial diagnosis of enterprise’s innovation culture and its components (organizational, motivational, intellectual and creative) and their elements. This approach in contrast to existing ones increases the objectivity and accuracy of diagnosis, and provides a highly effective control of its development. Testing of the methodical approach on industrial enterprises of the Sumy Region, Ukraine confirmed its feasibility.

4. The place of an enterprise innovation culture in the system of mechanisms of formation of innovative environment was defined. On this basis the structural and logic scheme of management mechanism of formation and development of innovative environment at the industrial enterprise was developed

5. The innovation culture of an industrial enterprise is viewed as a main component of innovative environment, providing possibility of social and cultural regulation of development and implementation of creative potential of its employees, their orientation to achieve best results.

The results deepen methodological and theoretical foundations of innovation management in improving the existing and developing new mechanisms of formation favorable business environment to enhance their innovation.

Further results are aimed at developing an organizational and economic tools of development management of the innovation culture of the industrial enterprise.

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