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MODEL OF THE ADAPTIVE MANAGEMENT SYSTEM OF AN INDUSTRIAL ENTERPRISE IN THE CONDITIONS OF INDUSTRY 4.0

Introduction. In the context of intensifying competition in the domestic and international markets, the problem of adaptive development of the industrial enterprise management system is very relevant in terms of ensuring long-term effective innovative modernization of the domestic economy. The long-term sustainable development of industrial enterprises, implementation of planned programs and projects in the digital environment directly depend on the efficiency of the management system. The effectiveness of the adaptive development of the management system of industrial enterprises depends on its ability to respond in a timely manner to the impact of external and internal factors.

Adaptive management is the most important component of crisis management, as it allows timely identification of external dangers and opportunities of the enterprise, internal strengths and weaknesses of its economic activity and, based on the assessment of the situation, development of solutions aimed at preventing crisis events.

Learning Literature. V. Otenko and O. Kolodina present an analysis of the conceptual and categorical apparatus of adaptive management along the chain «adaptation» – «adaptive management» – «adaptive management system» – «adaptability» – «adaptive potential» – «adaptive regulator». V. Otenko and O. Kolodina focus on the adaptive regulator, which is a key figure in the adaptation process [6]. A number of scholars consider «adaptive management» as a process [5], as a managerial activity [3], as a system [1-2; 7].

Therefore, adaptive management is related to the implementation of adaptation and should include not only the adaptation process itself, but also the work on preparation for it, which consists in monitoring the business environment and forecasting trends in the impact of its factors on the capabilities of the enterprise.

The article aims at generalizing the theoretical foundations of adaptive management of an enterprise and developing an ecosystem model of adaptive management of development of economic sectors in the

post-war period based on the mechanism of cross-sectoral interaction.

Results and discussion. The development of scientific, technical and innovative potential is the key to sustainable economic growth, political stability and global leadership.

Governments of developed countries are implementing large-scale programs of technological development of industry, such as the Industrial Internet Consortium and Advanced Manufacturing Partnership (USA), Industry 4.0 (Germany), Factories of the Future (European Union), Made in China 2025 (China), aimed at ensuring national superiority in entire industries or technological segments.

The creation of new technology markets is inextricably linked to the digital transformation of the economy and is driven by the acceleration of scientific and technological progress and new formats of these markets that are cross-sectoral in nature. The widespread use of digital technologies in industry is a catalyst for the creation of new high-tech products at the intersections of industries.

Identifying new economic trends and reducing the time required to make decisions on enterprise management in the context of digitalization allows the use of such a mechanism as the formation of an industrial cross-sectoral ecosystem by high-tech production.

The process of forming an industrial cross-sectoral ecosystem by high-tech production is a process that involves the use of organizational, legal, technological, financial and economic instruments.

A cross-sectoral ecosystem is a mechanism for the strategic development of high-tech industries that ensures inter-sectoral interaction of industrial enterprises, research and educational organizations of various departmental subordination, coordinated by federal executive authorities in cooperation with development institutions, which ensures interaction of ecosystem actors in a single digital space and provides participants with tools and services for the

implementation of innovative projects and accelerated launch of world-class high-tech products on the markets.

The digital platform of the cross-industry ecosystem is a global information platform that enables networking of entities from different economic sectors within the ecosystem, generation of innovative business models, launch of end-to-end digital processes at the intersections of traditional industries, and provision of organizational and economic tools and services to its participants.

The introduction of cross-industry ecosystems in industry will help boost the innovative development of high-tech industries and ensure that the country maintains its leadership position in the high-tech sector.

In order to ensure the economic development of Ukrainian industrial enterprises in the context of digital transformation, it is necessary to develop a unified strategy for the development of the digital industry, which will determine the mechanisms for introducing

new technologies, sources of funding and centers of responsibility.

Given the speed of changes that occur in the process of strategic development, it is advisable to analyze economic trends at each stage. Ukraine's digital industry development strategy should include development programs and projects.

In the current environment, there is a structural imbalance in the approaches to the implementation of industrial policy at the state level and the development of new high-tech industries. This requires the development of a new model for managing technological development. A balanced state industrial policy can be the basis for an accelerated transition from martial law industry to the creation of new industries at the intersection of technologies.

To solve these problems, it is necessary to introduce modern approaches to managing industrial enterprises in the context of digital transformation, which have a cross-sectoral nature of the process of manufacturing high-tech products (Fig. 1).

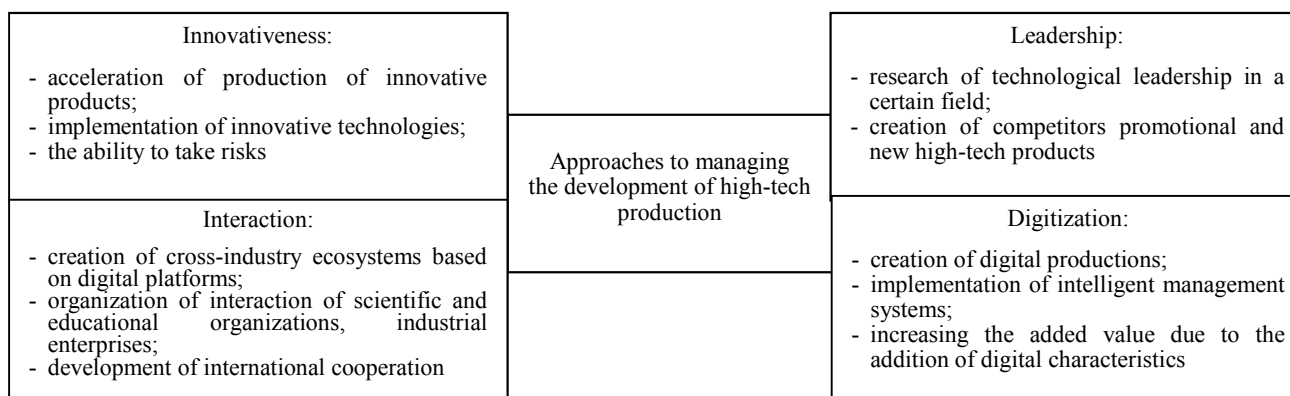


Fig. 1. Approaches to adaptive management of high-tech production development

Leadership involves the study of technological leadership in a particular industry; creation of competitive and new high-tech products.

Fig. 2 shows the system of adaptive management of an industrial enterprise in a changing digital environment, which is based on the identification of a set of elements with certain links between them.

The main goal of the system of adaptive management of an enterprise in the context of a changing digital environment is the effective development and operation of an industrial enterprise, based on the coordination of the efforts of the management entity and the use of modern information and digital technologies.

The system of adaptive management of an industrial enterprise in a changing digital environment determines the order of interaction of many elements of the system, which allows making management decisions and coordinating the interaction of all elements to achieve the strategic goal of an enterprise operating in a constantly changing digital environment.

Thus, the system of adaptive management of an industrial enterprise should be considered as a set of

methodological, technical, software, and information tools that ensure the effective functioning of the subsystems of the management system.

Fig. 3 shows the structure of the adaptive management system of an industrial enterprise. The above management system includes a number of subsystems that provide: coordination, information, resource support, time management, regulatory and legal support.

Thus, the coordinated work of all the presented subsystems of the high-tech enterprise management system will ensure the effective achievement of the strategic goal. At the same time, the volatility of the enterprise's digital environment requires an adequate response from the subsystems of the management system to the processes taking place in the external environment.

The disadvantages of the current model of adaptive management of industrial enterprises include: high centralization of management; dominance of the public sector; low innovation activity; lack of network interaction: science-industry-market sectoral specialization.

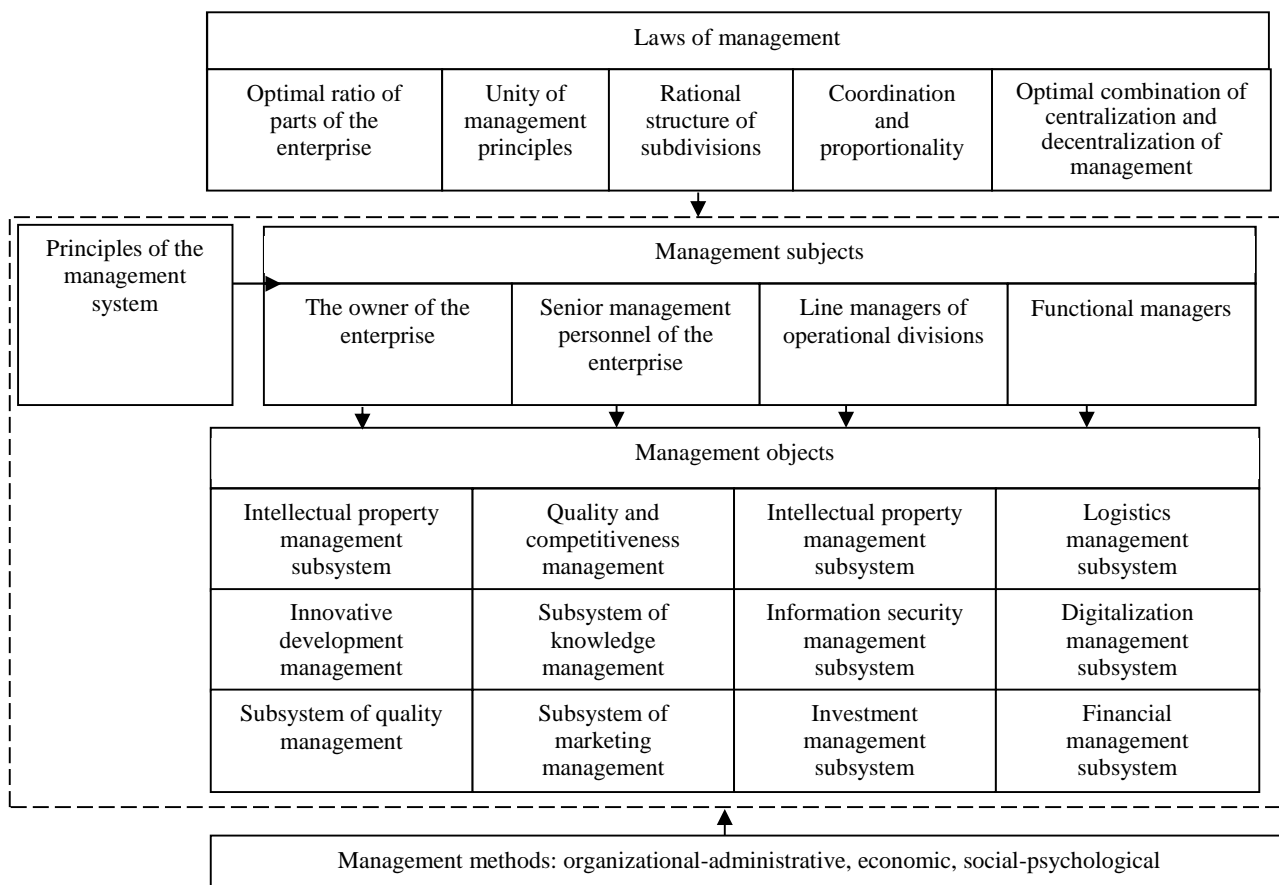


Fig. 2. Model of the adaptive management system of an industrial enterprise in the context of digitalization

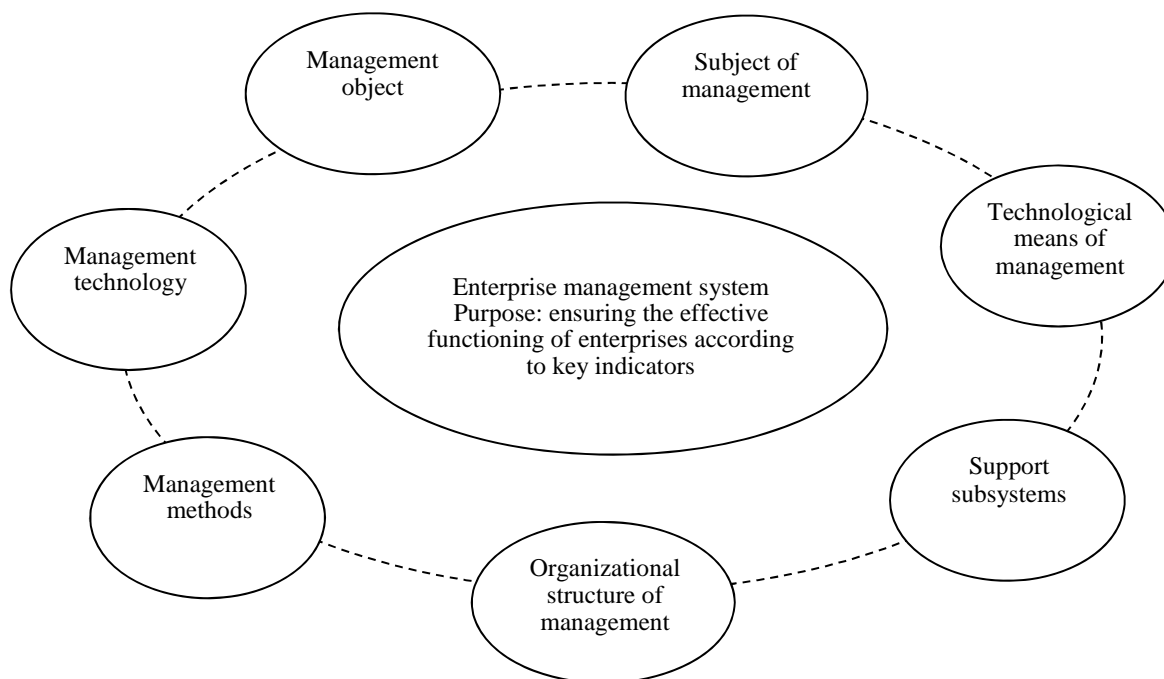


Fig. 3. Content of the structure of the adaptive management system of an industrial enterprise in the context of digitalization

The tools that should be used in the process of transforming the model of adaptive management of industrial enterprises in the post-war period include: development of cross-sectoral cooperation; creation of an industrial ecosystem; research of technological advantages in production; introduction of cross-cutting digital technologies.

In the process of developing and implementing an ecosystem model for managing the development of high-tech industries in the post-war period based on the mechanism of cross-sectoral interaction, the shortcomings of the current model and external processes affecting the industrial complex as a whole, such as digitalization, environmental friendliness, and restrictive measures, should be taken into account.

The target model of adaptive management of industrial enterprises in the post-war period includes the creation of:

1. A self-regulating management model based on a mechanism of cross-sectoral interaction.
2. Ecosystems – a new organizational and economic form of industrial enterprise management.

3. Technologies and products that are factors in creating an ecosystem.

4. Equal and simplified access to all ecosystem participants.

5. Equal participation of the state in the functioning of the ecosystem.

The ecosystem model of industrial enterprise management in the context of digitalization allows each ecosystem participant to optimize its own business processes, diversify production, participate in the value chain of other participants' products, reduce transaction costs, implement innovative projects, while gaining a powerful synergistic effect of interaction with other ecosystem participants.

The ecosystem model of cross-industry interaction can be an effective mechanism for ensuring the strategic development of industrial enterprises producing high-tech products in the post-war period of Ukraine.

The model of adaptive management of the development of the high-tech industry in the post-war period based on the mechanism of cross-sectoral interaction is presented in Fig. 4.

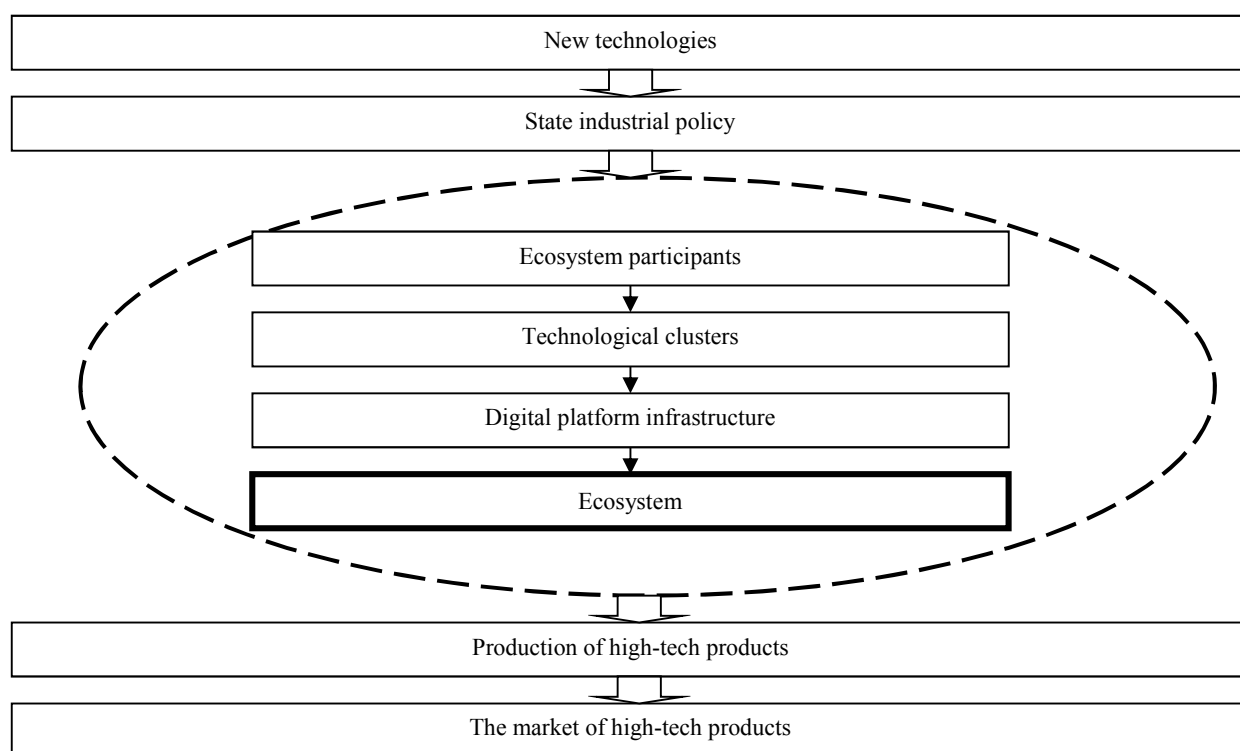


Fig. 4. Ecosystem model of adaptive management of the development of economic sectors in the post-war period based on the mechanism of cross-sectoral interaction

Conclusions. The transition to the ecosystem model of managing the development of high-tech industries in the post-war period will allow for a consolidated industrial policy that will increase the involvement of large enterprises in the production of civilian products and the level of diversification of the traditional industry. For a successful transition to a

governance model based on a mechanism of cross-industry cooperation, it is necessary to ensure the formation of an organizational structure of a digital platform of the cross-industry ecosystem that has the potential to scale up to other high-tech industries or facilitate their emergence.

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Коритко Т. Ю., Пилецька С. Т. Модель адаптивної системи управління промисловим підприємством в умовах Індустрії 4.0

У роботі досліджено понятійно-категоріальний апарат теорії адаптивного управління підприємствами в умовах цифровізації економіки. Метою статті є узагальнення теоретичних основ адаптивного управління підприємством та розробка екосистемної моделі адаптивного управління. розвитку галузей економіки в післявоєнний період на основі механізму міжгалузевої взаємодії.

У статті представлено основні підходи до дослідження поняття «адаптації». Досліджено сучасні підходи до управління промисловими підприємствами в умовах цифрової трансформації, які мають міжгалузевий характер процесу виробництва наукомісткої продукції.

Запропоновано систему адаптивного управління промисловим підприємством. Система адаптивного управління промисловим підприємством в мінливому цифровому середовищі визначає порядок взаємодії багатьох елементів системи, що дозволяє приймати управлінські рішення та координувати взаємодію всіх елементів для досягнення стратегічної мети підприємства, що працює в умовах постійного зміна цифрового середовища.

Розроблено екосистемну модель міжгалузевої взаємодії, яка може бути дієвим механізмом забезпечення стратегічного розвитку промислових підприємств з виробництва високотехнологічної продукції у повоєнний період України. Для успішного переходу до моделі управління, заснованої на механізмі міжгалузевої співпраці, необхідно забезпечити формування організаційної структури цифрової платформи міжгалузевої екосистеми, яка має потенціал масштабування до інших високотехнологічних компаній. технологічних галузей або сприяти їх появі.

Ключові слова: міжгалузева екосистема, адаптивне управління, цифрові платформи, адаптація, високотехнологічне виробництво, адаптивні системи управління.

Korytko T., Piletska S. Model of the Adaptive Management System of an Industrial Enterprise in the Conditions of Industry 4.0

The work examines the conceptual and categorical nature of the apparatus of the theory of adaptive management of enterprises in the conditions of digitalization of the economy. The article aims at generalizing the theoretical foundations of adaptive management of an enterprise and developing an ecosystem model of adaptive management of development of economic sectors in the post-war period based on the mechanism of cross-sectoral interaction.

The article presents the main approaches to the study of the concept of "adoption". Modern approaches to the management of industrial enterprises in the conditions of digital transformation, which have a cross-industry nature of the process of production of knowledge-intensive products, have been studied.

A system of adaptive management of an industrial enterprise is proposed. The system of adaptive management of an industrial enterprise in a changing digital environment determines the order of interaction of many elements of the system, which allows making management decisions and coordinating the interaction of all elements to achieve the strategic goal of an enterprise operating in a constantly changing digital environment.

An ecosystem model of cross-industry interaction has been developed and can be an effective mechanism for ensuring the strategic development of industrial enterprises producing high-tech products in the post-war period of Ukraine. For a successful transition to a governance model based on a mechanism of cross-industry cooperation, it is necessary to ensure the formation of an organizational structure of a digital platform of the cross-industry ecosystem that has the potential to scale up to other high-tech industries or facilitate their emergence.

Keywords: cross-industry ecosystem, adaptive management, digital platforms, adaptation, high-tech production, adaptive control systems.

