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THE ESSENCE OF MODELS OF THE ECOSYSTEM APPROACH TO SUSTAINABLE DEVELOPMENT OF COMMERCIAL ENTERPRISES IN UKRAINE

The article highlights the importance of an ecosystem approach for the sustainable development of commercial enterprises in Ukraine, emphasizing the integration of economic, social, and environmental aspects. It examines models of business ecosystems, including platform, sustainable, industrial clusters, corporate, and regional innovation ecosystems, each with its own advantages and disadvantages. Special attention is given to the industrial cluster model, which enhances competitiveness, efficiently utilizes resources, and stimulates innovation. This model helps companies enter international markets, interact with government bodies, and attract both external and internal investments. Based on the research results, the prospects for implementing industrial clusters to develop export potential, improve the regulatory environment, create innovative ecosystems, access financing, stimulate growth, internalize operations, develop related industries, improve product quality, and strengthen the local supplier network are identified. Additionally, recommendations and implementation steps for this model are provided for businesses and heads of innovation departments.

Key words: ecosystem approach, industrial clusters, commercial enterprises, sustainable development, model.

JEL classification: A11, L10, L11, O30, O32

СУТНІСТЬ МОДЕЛЕЙ ЕКОСИСТЕМНОГО ПІДХОДУ ДО СТІЙКОГО РОЗВИТКУ КОМЕРЦІЙНИХ ПІДПРИЄМСТВ УКРАЇНИ

Стаття присвячена важливості впровадження екосистемного підходу для стійкого розвитку комерційних підприємств в Україні. Виділена необхідність інтеграції економічних, соціальних та екологічних аспектів для забезпечення стійкого розвитку, через те, що українські підприємства стикаються з численними викликами, серед яких нестабільність економіки, екологічні проблеми та соціальні виклики. Впровадження моделей екосистемного підходу пропонується як один з ефективних способів подолання цих викликів. Розглянуто моделі екосистемного підходу, які включають бізнес-екосистеми, платформні екосистеми, стійкі екосистеми, індустріальні кластери, корпоративні екосистеми та регіональні інноваційні екосистеми. Кожна модель має свої особливості, переваги та недоліки. Підкреслено перспективність впровадження моделей індустріальних кластерів в українських умовах, так як вони сприяють підвищенню конкурентоспроможності підприємств, ефективному використанню ресурсів та стимулюванню інновацій. Модель індустріальних кластерів допоможе компаніям спільно виходити на міжнародні ринки, покращувати взаємодію з державними органами та залучати інвестиції. У кінцевому результаті даного дослідження було визначено перспективи впровадження моделі індустріальних кластерів комерційними підприємствами України через спільний розвиток експортного потенціалу, поліпшення регуляторного середовища, створення нових інноваційних екосистем, поліпшення доступу до фінансування державою та грантовими організаціями, стимулювання сталого зростання і розвитку, інтерналізацію та створення нових глобальних альянсів, розвитку суміжних галузей, поліпшення якості продукції та послуг, зміцнення локальної мережі постачальників та значної економії на масштабуванні обраної екосистеми. Додатково надані рекомендації та кроки впровадження моделі індустріальних кластерів комерційними підприємствами України задля визначення ключових етапів впровадження для власників бізнесу та керівників інноваційних підрозділів.

Ключові слова: екосистемний підхід, індустріальні кластери, комерційні підприємства, стійкий розвиток, модель.

Statement of the problem. In the modern dynamic business environment focused on innovation and constant change, commercial enterprises in Ukraine face challenges in ensuring sustainable development. One effective approach to addressing these challenges is the implementation of ecosystem models. These models allow enterprises to integrate the economic, social, and environmental aspects of their activities, creating mutually beneficial conditions for all participants in the business ecosystem. Therefore, the research and study of the essence of these models is relevant.

Analysis of recent research and publications. The essence, problems and prospects of the development of the «ecosystem approach» were investigated in their works: A.G. Tansley [1] study explored the use and

misuse of vegetation concepts and terms, establishing the foundational concept of ecosystems in ecology. J.F. Moore [2; 3] investigated the dynamics of competition in business ecosystems, introducing a new ecological perspective to business competition and analyzed the strategies and leadership necessary in the age of business ecosystems, emphasizing the shift from traditional competition to ecosystem-based collaboration. C. Folke, R. Biggs, A.V. Norström, B. Reyers, J. Rockström [4] examined the integration of social-ecological resilience into sustainability science to promote biosphere-based sustainability. S.L. Vargo, R.F. Lusch [5] expanded the service-dominant logic framework, discussing its implications and providing updates on its foundational axioms. R. Adner [6; 14] proposed an actionable construct

for strategy, redefining the ecosystem concept as a structure to improve strategic management in business and introduced a new strategy for innovation through a broad lens, focusing on interdependencies and complementarities in business ecosystems. B. Spigel [7], R. Brown, C. Mason [8] critically reviewed and conceptualized entrepreneurial ecosystems, focusing on their structural components and dynamic processes. P.T. Roundy, M. Bradshaw, B.K. Brockman [9] investigated the emergence of entrepreneurial ecosystems using a complex adaptive systems approach, emphasizing their adaptive nature. E.J. Malecki [10] discussed the geographic and contextual factors influencing entrepreneurship and the formation of entrepreneurial ecosystems. A. Gawer, M.A. Cusumano [11] analyzed how companies like Intel, Microsoft, and Cisco drive industry innovation through platform leadership. C. Folke [12] explored resilience and sustainable development, emphasizing building adaptive capacity amid global transformations. M.E. Porter [13] examined the role of clusters in the new economics of competition, highlighting their impact on competitive advantage and regional development. P. Cooke [15] studied regional innovation systems, analyzing competitive regulation and innovation processes in Europe. However, the listed experts did not consider the following issues: features of ecosystem approach models, advantages and disadvantages of ecosystem approach models, prospects for the implementation of the model of industrial clusters by commercial enterprises of Ukraine, recommendations and steps of implementation of the model of industrial clusters by commercial enterprises of Ukraine.

Objectives of the article. To explore the essence of ecosystem models, determine their features, advantages, disadvantages, and future prospects, and provide recommendations regarding the implementation of the industrial cluster model for commercial enterprises in Ukraine.

Summary of the main results of the study. The concept of «ecosystem» was first introduced into biology

by British ecologist A.G. Tansley in 1935 in his scientific work «The Use and Abuse of Vegetational Concepts and Terms» [1]. However, considering this definition in the context of management and economics, the term «business ecosystem» was introduced by J.F. Moore in his influential article «Predators and Prey: A New Ecology of Competition», published in the Harvard Business Review [2]. In 1993, J.F. Moore continued to develop the concept of business ecosystems in his book «The Death of Competition: Leadership and Strategy in the Age of Business Ecosystems» (1996), where he examined in detail how companies interact in complex network relationships similar to biological ecosystems [3].

Let us consider the definition of the concept of «ecosystem approach» according to various researchers, Table 1.

The definitions of the essence of the ecosystem approach presented in Table 1 have both common general features and differences. For example, A.G. Tansley [1] proposed a basic understanding of an ecosystem as the interaction of living organisms and their physical environment, forming a holistic functional unit. This highlights the interconnection between the biotic and abiotic components of nature. J.F. Moore [2; 3] adapted this concept to the business context, defining a business ecosystem as a set of organizations and individuals that interact through competition and cooperation. He emphasizes the importance of company networks, adaptation, and joint development to achieve innovation and sustainable success. C. Folke, R. Biggs, A.V. Norström, B. Reyers, and J. Rockström [4] expanded on J.F. Moore's concept by adding socio-ecological resilience. They focus on the complex interrelationships between human and natural systems, where resilience is achieved through adaptive management. S.L. Vargo and R.F. Lusch [5] see ecosystems as dynamic systems of service exchange, where value is created through interaction and collaboration. They emphasize the economic aspect of interactions, focusing on service exchange and co-creation of value.

Table 1

Definition of the term «ecosystem approach»

№	Researchers, year	Definition of the term «ecosystem»
1	A.G. Tansley (1935)	The interaction of living organisms and their physical environment, which forms a functional unit.
2	J.F. Moore (1993)	An economic community consisting of interacting organizations and individuals.
3	J.F. Moore, (1996)	Networks of companies that work together and develop through competitive and cooperative interactions.
4	C.Folke, R. Biggs., A.V. Norström, B. Reyers, J. Rockström (2016)	A complex network of relationships between human and natural systems.
5	S.L. Vargo, R.F. Lusch (2016)	A dynamic and adaptive service exchange system.
6	R. Adner (2017)	A structure consisting of interdependent participants who jointly create value.
7	B. Spigel (2017).	A network of interconnected organizations and individuals, including entrepreneurs, investors, universities, government agencies, and other actors that interact and support entrepreneurial activity.
8	R. Brown, C. Mason (2017).	A complex and multi-component structure consisting of various actors and elements that interact to create favorable conditions for innovation and entrepreneurship.
9	P.T. Roundy, M. Bradshaw, B.K. Brockman (2018).	A complex adaptive system where numerous independent actors interact, adapt and evolve.
10	E.J. Malecki (2018).	A set of interrelated economic and social factors that create a context for entrepreneurship in a specific geographic area.

Source: formed on the basis of sources [1–10]

R. Adner [6; 14] views an ecosystem as a structure of interdependent participants who coordinate their actions to create and capture value, emphasizing the synchronization of strategies and joint development for overall success.

In contemporary definitions of entrepreneurial ecosystems, B. Spigel [7] highlights a network of interconnected organizations and individuals, such as entrepreneurs, investors, universities, and government institutions. His emphasis on organizational and social connections shows the importance of resource and knowledge exchange. R. Brown and C. Mason [8] describe an ecosystem as a complex structure of various actors and elements that interact to create favorable conditions for innovation and entrepreneurship. They identify markets, support networks, capital, talent, and culture as key components. P.T. Roundy, M. Bradshaw, and B.K. Brockman [9] see an ecosystem as an adaptive system where independent participants interact, adapt, and evolve. They include entrepreneurs, venture capitalists, incubators, educational institutions, and government organizations, creating a dynamic environment for entrepreneurial activity. E.J. Malecki [10] defines an ecosystem as a set of economic and social factors that shape the context for entrepreneurship in a specific geographic area. He highlights economic resources, human capital, social capital, and institutional support as key elements.

Common features of all these definitions are the emphasis on interaction between participants and elements that create an environment for the development of entrepreneurship and innovation. The differences lie in the focus on specific aspects: social and organizational connections (B. Spigel), structural complexity (R. Brown, C. Mason), adaptability and evolution (P.T. Roundy, M. Bradshaw, B.K. Brockman), as well as geographic and institutional context (E.J. Malecki). Foreign specialists have also emphasized that the success of an entrepreneurial ecosystem depends on the ability of its participants to adapt,

collaborate, and co-create value, indicating the complexity and multifaceted nature of entrepreneurial ecosystems.

Let's consider the list and definitions of the main models of the ecosystem approach:

1. J.F. Moore's Business Ecosystem Model – defined as an economic community of interacting organizations and individuals that develop through competition and cooperation. Participants in the business ecosystem, including suppliers, manufacturers, distributors, and consumers, collaborate to create shared value [2; 3].

2. Platform Ecosystem Model – focused on creating and maintaining a platform that brings together various participants (consumers and producers) for the exchange of services and goods. They support innovation through network effects and interactions among participants [11].

3. Sustainable Ecosystem Model – concentrated on balancing economic, social, and environmental aspects to ensure long-term development and stability. It involves the integration of environmentally friendly technologies and practices that reduce negative environmental impact [12].

4. Industrial Cluster Model – defined as geographical concentrations of interdependent companies, suppliers, service providers, and other institutions in a specific industry, which foster innovation and increase productivity through interaction and collaboration [13].

5. Corporate Ecosystem Model – consists of large companies and their partners, suppliers, distributors, and customers working together to achieve common goals. This model allows large corporations to manage their interactions and innovations more effectively [14].

6. Regional Innovation Ecosystem Model – encompasses a set of interacting organizations, including universities, research centers, businesses, and government organizations, that promote innovation and economic development in a specific region [15].

Let's consider the features of the ecosystem approach models, Fig. 1.

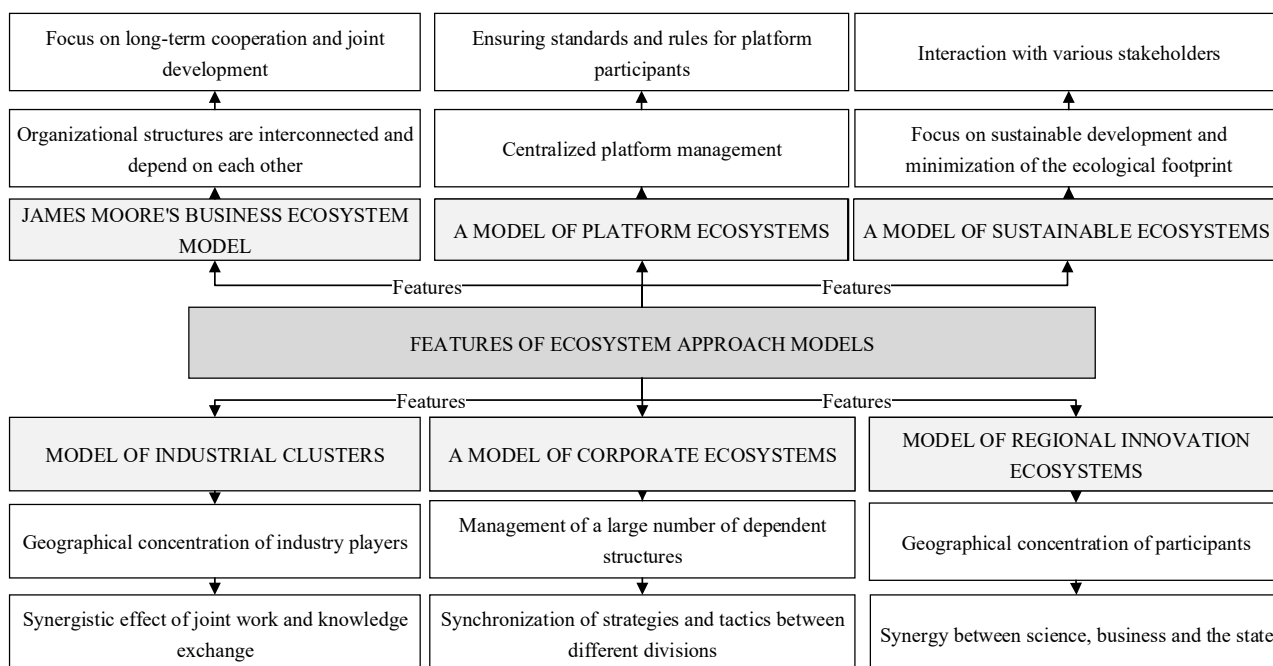


Figure 1. Features of ecosystem approach models

Source: formed on the basis of sources [11–15]

As shown in Figure 1, business ecosystems and industrial clusters are particularly effective in creating close, long-term partnerships, which facilitate the rapid exchange of knowledge and resources. Platform ecosystems and corporate ecosystems, due to centralized management, can ensure a high level of coherence and standardization, which is important for large and complex structures. Sustainable ecosystems emphasize environmental responsibility, which is becoming increasingly significant in modern business. Regional innovation ecosystems can stimulate local development and innovation through close interaction among key players. The use of these ecosystem approach models is especially relevant in the context of global economic changes and the growing focus on sustainable development.

Let's consider the advantages of the ecosystem approach models, Figure 2.

According to the data in Figure 2, James Moore's business ecosystem ensures resilience to market changes and rapid adaptation to innovations, enhancing competitiveness through cooperation. Platform ecosystems offer scalability and a network effect, where the value of the platform increases with the number of participants, making it ideal for managing large volumes of data. Sustainable ecosystems focus on improving the company's image, reducing environmental risks, and providing long-term economic benefits, which is crucial in the context of increasing attention to environmental responsibility. Industrial clusters contribute to increased productivity and accelerated innovation implementation, developing a specialized workforce and stimulating regional development. Corporate ecosystems optimize internal processes and improve coordination between departments, ensuring flexibility in adapting to market changes. Regional innovation ecosystems accelerate the commercialization of innovations and foster job creation, stimulating local economic development. Collectively, these models

demonstrate that integrating the economic, social, and environmental aspects of activities allows for the creation of sustainable and competitive business structures.

Let's consider the disadvantages of the ecosystem approach models, Figure 3.

As seen from the data in Figure 3, the business ecosystem model, for example, requires significant resources and complex management to maintain interactions between participants. This can complicate its use for enterprises with limited resources. Platform ecosystems depend on a central player, which creates a risk of monopolization and makes all participants dependent on one major player. This can lead to reduced competition and innovation. The sustainable ecosystem model requires high initial costs and changes in corporate culture, which can be challenging for many companies. It is particularly difficult for those accustomed to traditional practices and not ready for drastic changes. Industrial clusters, despite their advantages, can suffer from high internal competition and dependence on the economic situation in the region, making them less resilient in unstable economic conditions. Corporate ecosystems face difficulties in management and coordination among numerous units, requiring significant costs to maintain infrastructure. This can be especially problematic for large companies with complex structures. Regional innovation ecosystems require significant investments and often depend on government support, which can be unstable, creating risks for the long-term development and sustainability of such ecosystems.

Overall, despite significant advantages, implementing ecosystem models requires companies to be prepared for substantial investments, changes in corporate culture, and complex management.

Let's consider the prospects for implementing the industrial cluster model by commercial enterprises in Ukraine, as shown in Figure 4.

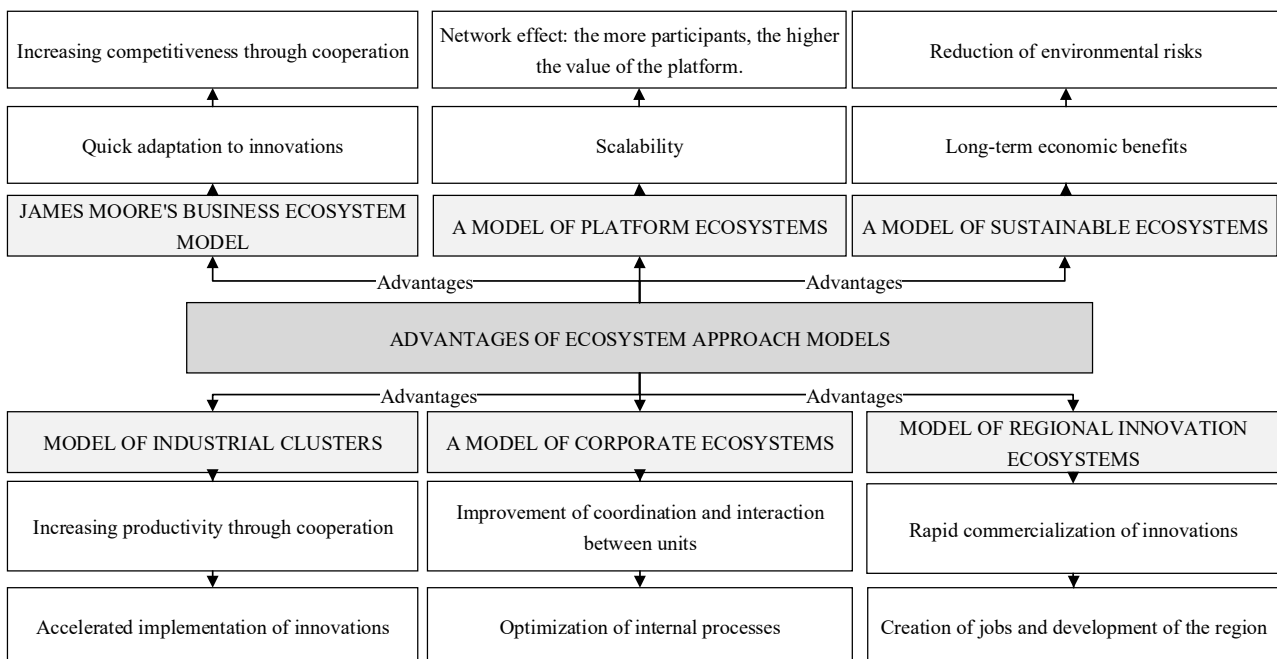


Figure 2. Advantages of ecosystem approach models

Source: formed on the basis of sources [11–15]

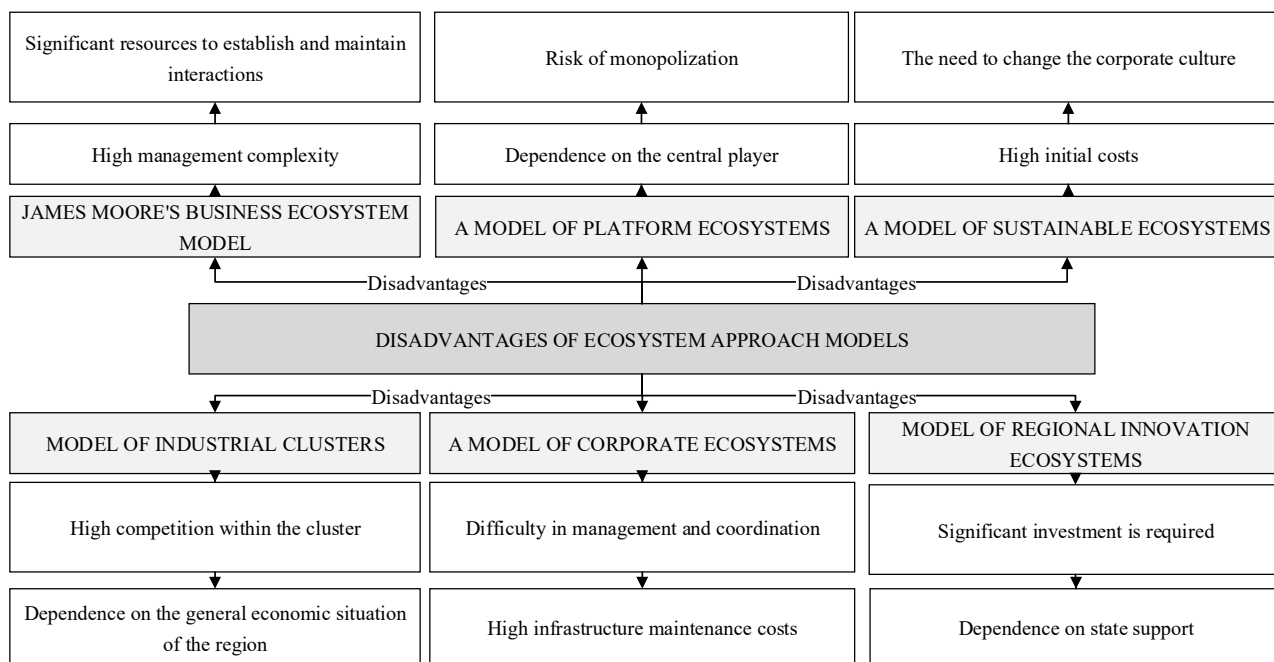


Figure 3. Disadvantages of ecosystem approach models

Source: formed on the basis of sources [11–15]

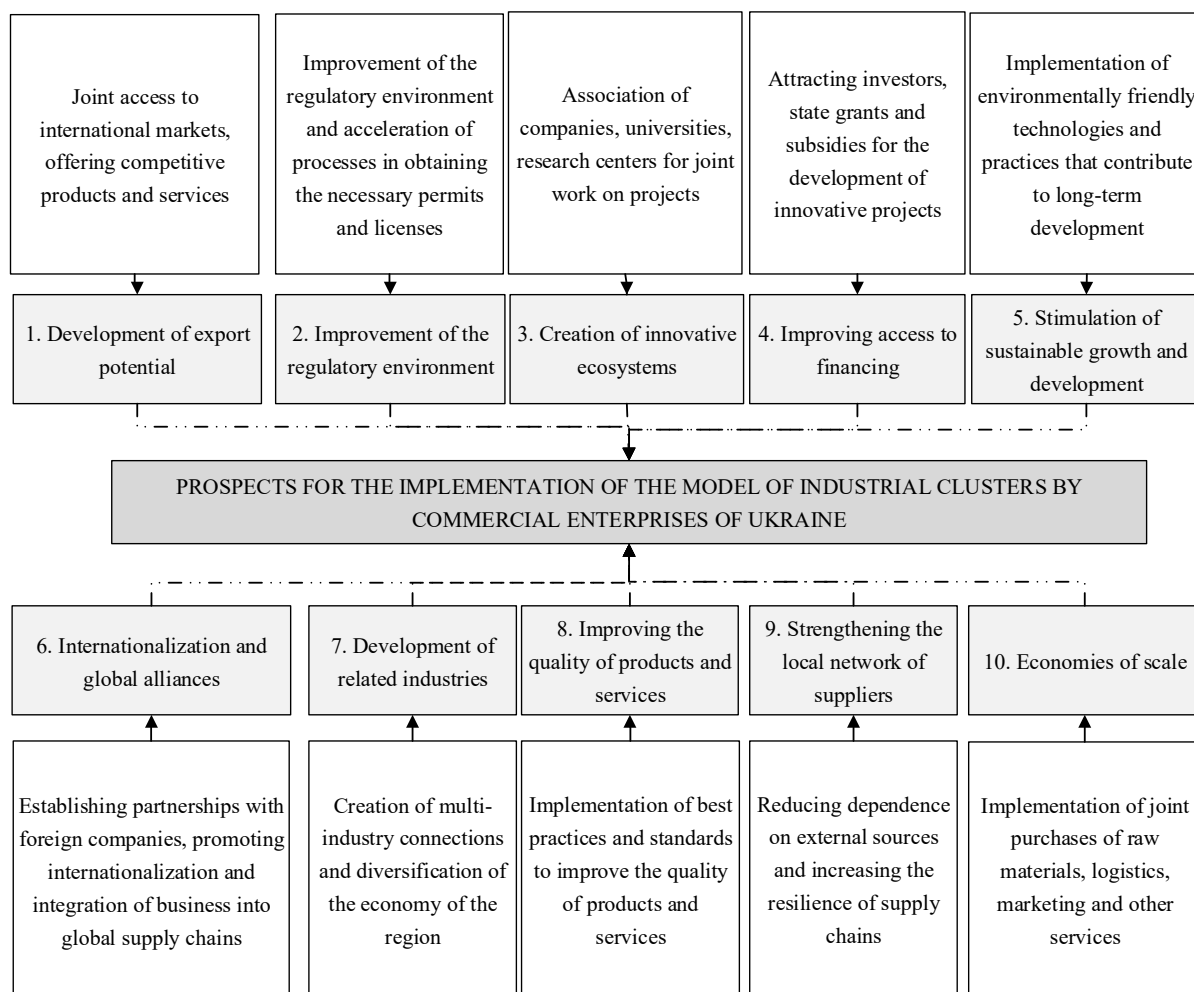


Figure 4. Prospects for the implementation of the model of industrial clusters by commercial enterprises of Ukraine

Source: formed by the author himself

According to the data in Figure 4, it can be concluded that implementing the industrial cluster model by commercial enterprises in Ukraine has many advantages. Firstly, clusters help companies jointly enter international markets, offering competitive products and services. This enhances export potential and promotes the internationalization of businesses. Secondly, clusters enhance interaction with government bodies, facilitating quicker acquisition of necessary permits and licenses, thereby improving the regulatory environment. They also create innovative ecosystems by bringing together companies, universities, and startups to collaborate on new projects. Clusters facilitate access to financing by attracting investors and increasing chances of receiving government grants and subsidies. They also promote sustainable

growth by supporting the adoption of environmentally friendly technologies and practices. Industrial clusters help companies establish international connections and participate in global supply chains, thereby expanding their market and enhancing competitiveness. They also stimulate the development of related industries such as logistics and IT, contributing to economic diversification in the region.

Additionally, clusters improve product and service quality through process standardization and the exchange of technologies and knowledge among participants. The development of local suppliers reduces dependence on external sources and enhances supply chain reliability. Joint procurement and shared services help reduce operational costs through economies of scale. Thus, this "ecosystem"

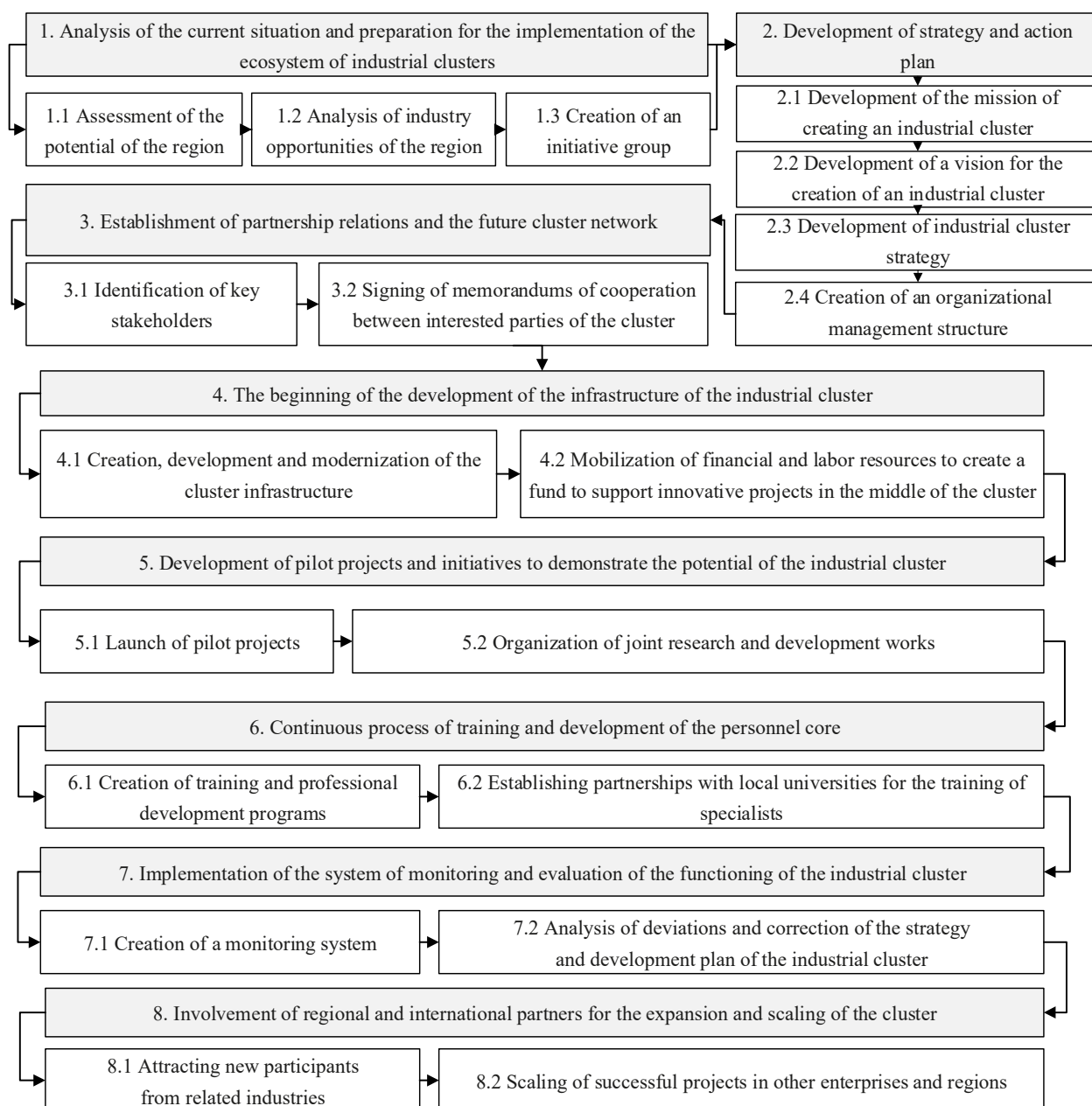


Figure 5. Recommendations and steps of implementation of the model of industrial clusters by commercial enterprises of Ukraine

Source: formed by the author himself

will help Ukrainian enterprises become more competitive, resilient to external and internal risks, promote innovation, and strengthen international ties. Overall, the use of industrial cluster ecosystems can significantly improve the economic situation in the region and the country as a whole.

Let's consider the developed recommendations and steps for implementing the industrial cluster model by commercial enterprises in Ukraine, as shown in Figure 5.

As illustrated in Figure 5, a phased approach is necessary for the successful implementation of the industrial cluster model in commercial enterprises in Ukraine. First, an assessment of the current regional situation is conducted, analyzing economic, social, and environmental conditions, as well as identifying potential participants. Key industries are identified, a strategic analysis is carried out, and an initiative group is created to coordinate the project.

Next, the mission and vision of the industrial cluster are formulated, and a strategy and action plan are developed, including the organizational structure and management. Key participants are engaged through meetings and formalized partnerships, and a communication system is established. Infrastructure is developed, and financial resources are mobilized. The implementation of pilot projects and joint R&D begins to demonstrate the cluster's potential. Training and personnel development are conducted through

specialized programs and partnerships with educational institutions. A monitoring and evaluation system is established, with regular reports and strategy adjustments. In the final stage, the composition of participants expands, international connections are established, successful projects are scaled, and new initiatives are developed.

Conclusions. The results of the conducted research highlight the importance of the ecosystem approach for the sustainable development of commercial enterprises in Ukraine, emphasizing the integration of economic, social, and environmental aspects. Various models of business ecosystems, platform ecosystems, sustainable ecosystems, industrial clusters, corporate ecosystems, and regional innovation ecosystems were examined, each with its own advantages and disadvantages. Special attention was given to the industrial cluster model, which enhances competitiveness, effectively utilizes resources, and stimulates innovation. This model will help companies enter international markets, interact with government bodies, and attract both external and internal investments. The research concludes that the implementation of industrial cluster models will contribute to the development of export potential, improvement of the regulatory environment, creation of innovative ecosystems, and stimulation of sustainable growth. Although the implementation of these models requires significant resources and changes in corporate culture, the benefits of their use outweigh the possible disadvantages.

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