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ENTERPRISE ECOSYSTEM AND SUSTAINABLE DEVELOPMENT: IMMANENT INTERDEPENDENCE

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Abstract: *Global hypercompetition necessitates the development of new models of business collaboration among economic entities. Enterprise ecosystem is one form of organization and support for entrepreneurship that facilitates the transition from competition to cooperation among business entities. The article explores various theoretical approaches to defining the concept of ecosystem that enabled to propose the author's interpretation. It is substantiated that the entrepreneurial ecosystem offers optimal pathways and effective tools for fostering innovation and economic growth, grounded in the principles of sustainable development. A comparative analysis of organizational models of activity is conducted. Compared to other organisational models, the ecosystem entails the transformation of hierarchical management mechanisms, giving rise to a dynamic environment facilitating the free exchange of knowledge, information, resources, technologies, and competencies. The synergistic model of the enterprise ecosystem within the framework of sustainable development is proposed. The model exhibits several characteristic features: cross-industry interaction, which maximizes synergies more effectively than corporate ties; diversification of activities with a focus on lean innovation; emphasis on environmental sustainability and the commercialization of developments; flexibility of business processes; autonomy of participants and adherence to voluntary cooperation principles. The article substantiates the key improvement strategies that enterprises should implement to achieve synergistic effects and sustainable development goals within the enterprise ecosystem.*

Keywords: *ecosystem, sustainable development, partnership, ecosystem life cycle, synergistic effect.*

INTRODUCTION

The transformation of national economies in the context of the growing Fifth Industrial Revolution is accompanied by multi-vector, large-scale changes across all sectors. At its core, this involves structuring the global economy, advancing sustainable development initiatives, fostering circular business models, and establishing ecosystems that are inherently shaped by innovative changes in global economic processes. In the context of intensifying international competition, business entities that effectively develop and implement innovative projects, leveraging their resource capabilities productively and maximizing their scientific and technological potential, will gain a competitive advantage.

To realize these advantages, it is imperative to establish an appropriate information and technology framework and develop a new management model – an ecosystem – designed to facilitate the digital transformation of enterprises, foster innovation, promote the intellectual

and professional growth of employees, and modernize business processes in accordance with evolving market conditions. This highlights the imperative to tackle challenges associated with the exploration of organizational and management models – ecosystems that provide optimal methods and efficient tools to promote innovation and economic growth, all anchored in the principles of sustainable development.

The challenges posed by the accelerated process of globalization and transnationalization, coupled with the unpredictable nature of the global economy amidst prolonged crises, necessitate that business entities realign their economic, technological, innovative, and environmental development strategies. The growing role of the ecosystem is a polymorphic phenomenon today and an important element of management in a turbulent business environment.

The issues of environmental protection and the rational use of natural resources, crucial for societal well-being, industrial development, and public health, are intricately intertwined with the modern concept of VUCA – Volatile, Uncertain, Complex, and Ambiguous. VUCA represents a turbulent and volatile business environment where stability cannot be guaranteed. Simultaneously, the significance of the enterprise ecosystem is on the rise, necessitating the consideration of changes in both internal and external environments, and the assurance of control amidst escalating complexity and inherent instability. At the present stage, long-term economic development is only achievable through the establishment of a new ecosystem for resource utilization, aimed at fostering the growth of various economic activities. Moreover, the theoretical underpinning of the enterprise ecosystem constitutes an integral aspect of the concept of sustainable development.

The evolution of the ecosystem concept

The dynamic shifts in competitive forces towards innovation, the rapid adoption of new technologies, and a receptiveness to change have transformed the primary objective of prevailing enterprise strategies. Now, it's not only about attaining competitive leadership but also about fostering effective cooperation to ensure sustainable development of each partner and society as a whole. Ecosystem is one of the organizational forms for entrepreneurship that facilitates the coordination of interactions between business entities, guiding them from dynamic competition towards productive partnerships.

The concept of ecosystem represents a post-neoclassical approach in economic science, as evidenced by its distinct features: the advancement of synergetics concepts, the widespread adoption of co-evolution principles, and the utilization of interdisciplinary integrated approaches within the realm of entrepreneurship.

Understanding the fundamentals of utilizing ecosystems in economic theory requires an examination of the historical origin of the prefix "eco". The earliest recorded use of the prefix "eco" dates back to the writings of Hesiod in the 8th to 7th centuries BC (Alvedalen & Boschma, 2017). Hesiod described an autonomous household, the "oikos" (οἶκος), which is the basic economic unit of a state and encompasses various activities, products and citizens. The terms "ecology" and "economy" are derived from the concept of "oikos".

There are different scientific views on the formation of the concept of ecosystem and its relationship with the economy. Rothschild (1991) in his work "Bionomics: Economy As Ecosystem" considers the economy to be an analogue of a biological ecosystem. The author

emphasised the nature of cooperation between economic agents, their innovativeness and relations with the external environment.

According to Muegge and Mezen (2017), the greatest influence on the emergence and development of the concept of ecosystems in the economy was made by such areas of economic theory as organisational ecology, neo-institutional theory, and the concept of dynamic capabilities of the enterprise. Additionally, these theories are part of the strategic management concept, which considers ecosystem as a competitive advantage of the enterprise in value creation.

Examining ecosystem through the lens of entrepreneurship allows us to trace its evolutionary development, which can be attributed to theories such as the cluster theory of economic development (Bergman & Feser, 1999), the concept of regional innovation systems (Cooke, 1996), and the theory of entrepreneurial networks (Hite & Hesterly, 2001).

The pioneer of the concept of ecosystems in the realm of entrepreneurship is the British economist Valdes (1988), who first introduced this concept to the scientific community in 1988. In his article "Entrepreneurial Ecosystem: Towards a Theory of New Business Formation", he asserts that ecosystem structure in the process of new business formation contains two dynamic elements: the entrepreneur and the entrepreneurial environment.

In the book "The Emergence of a New Corporate Form", Moore (1998) emphasizes that "Entrepreneurial ecosystems, much like successful species in nature, emerge from essential resources. Ecosystems condense from capital, customer interests, and the talent generated by innovation, mirroring how successful species thrive from sunlight, water, and nutrients in the soil" (Moore, 1998, p. 170).

Noteworthy is the opinion of Spilling (1996), who, in his works on regional entrepreneurship, states that entrepreneurial ecosystem consists of various actors, roles, and environmental factors that interact with each other.

A similar perspective is shared by Cohen (2006), who observes that "Entrepreneurial ecosystems are a diverse set of interdependent actors within a geographical region that influence the formation and trajectory of the entire group of actors and, possibly, the economy as a whole" (Cohen, 2006, p. 4).

Isenberg's (2010) interpretation of the ecosystem holds practical significance. The scientist believes that entrepreneurial ecosystem consists of a set of individual elements, such as leadership, culture, capital markets, and customers, which are interconnected.

Mason and Brown (2015) define the concept of ecosystem through the lens of partnership. The authors argue that "Ecosystem is a set of interrelated business entities, organizations, institutions, and processes, formally and informally united for interconnection" (Mason & Brown, 2015, p. 53).

A similar opinion is shared by Adner (2017), who defines ecosystem as follows: "A set of networks of suppliers, distributors, outsourcing companies, producers of related goods or services, technologies, providers, and other organizations that influence and are influenced by a company by creating and delivering their own offerings" (Adner, 2015, p. 48).

The innovative aspect of ecosystems is emphasized by Autio and Thomas (2014). The scientists note that "ecosystem is a network of interdependent organizations linked to a central

firm or platform, including a producer and external partners, which together create new value through innovations" (Autio & Thomas, 2014, p. 90).

The technological orientation in defining ecosystems is evident in the scholarly work of Adomavicius, Boxstedt, and Kaufman (2007). These scientists argue that ecosystem comprises a collection of interdependent technologies and technological advancements that influence evolutionary processes.

Thus, an analysis of publications dedicated to ecosystem research reveals that scientists possess a deep understanding of existing challenges. Furthermore, it demonstrates the gradual formation of theoretical, methodological, and methodical approaches aimed at addressing these issues. From the generalization of views on the essence of ecosystem, five scientific areas of ecosystem interpretation through the prism of sustainable development emerge. These include the rational use of resources, environmental protection, economic growth, improvement of social protection, and consideration of the interests of present and future generations.

The essence and the main stages of ecosystem development

The ecosystem concept enables to reevaluate agglomeration interaction across several dimensions: regional (national, sectoral, municipal ecosystems), sectoral (industrial, media, financial, etc.), and functional (entrepreneurial, innovative, digital). The goal of ecosystem is to achieve coordinated development among its stakeholders by integrating requirements, rights, and responsibilities. Consequently, coevolution becomes a dynamic component of the business ecosystem, representing the overarching goal of its evolution. Coevolution entails the attainment of new system properties, the realization of social and economic effects, and both quantitative and qualitative changes in the processes of cooperation and competition.

It is worth noting that, unlike clusters and network groups, the initiation of ecosystem association does not solely belong to one participant. Cooperation within the ecosystem is driven by self-organization, where each member benefits from the others. Self-organization underpins the principles of cooperation and partnership, serving as the foundation for relations among ecosystem participants and distinguishing ecosystem from other organizational models. A comparative analysis of organisational models is presented in Table 1.

Table 1

Comparative characteristics of organisational models

Comparison criteria		Cluster	Network organisation	Ecosystem
1.	The purpose of the formation	Increasing the competitiveness of an industry or region	The utilization of features, resources, and specific advantages for the collaborative implementation of entrepreneurial projects.	Initiating and implementing business innovations or a unique product
2.	Boundaries of the association	Geographic or sectoral	The value chain of a particular product or service	Cross-sectoral, cross-territorial

3.	Criteria for mergers	By stages of the production process	Along the chain of creation and sale of products or services	By stages of the life cycle of a new product or new technology
4.	Relationships between participants	Internal competition	Consolidation of goals	Cooperation and partnerships
5.	Opportunity to become a member	Restrictions and requirements for participants	Specific rules for entering the system	High degree of openness
6.	Management	Existence of governing bodies at the state or regional level	The management body belongs to the initiator of the network association	Self-organisation

Source: Wurth et al., 2021

Based on the information in Table 1, it can be argued that the differences between these models are not fundamental, but reflect the goals and challenges of certain stages of economic development. It is worth noting that, unlike other organisational and economic models of development, ecosystems have three important advantages: they provide access to multi-vector opportunities for innovative growth, facilitate rapid scaling, and are flexible and models.

So, it can be concluded that in our opinion, ecosystem is an integrated adaptive system that includes a complementary set of active subjects, types of activities, cooperative relations, internal and external environment factors (social, economic, infrastructural, and institutional) that provide for the efficient use of human, material, and intellectual resources for the purpose of sustainable development.

The scope of the study

In line with the theoretical framework previously outlined, which emphasizes the conceptual foundation of ecosystems, the subsequent sections of the article will present fundamental findings, concentrating on the following objectives:

- to justify the growing interest and relevance of research in the field of entrepreneurial ecosystems;
- to outline the relationship between the enterprise ecosystem and the innovation ecosystem;
- to determine the main stages of ecosystem development
- to substantiate key development vectors that enterprises need to implement in order to ensure the leadership position of the entrepreneurial ecosystem;
- to develop the synergistic model of enterprise ecosystem within the framework of sustainable development.

The proposed synergistic model includes fostering collaboration, innovation, and mutual benefit among ecosystem participants, as well as implementing sustainable practices

and policies that promote the triple bottom line of economic prosperity, environmental stewardship, and social equity.

METHODOLOGY

This article is based on secondary sources of data, which were obtained from published books, journals, and research papers. The study adopts a qualitative research approach.

RESULTS

The increasing interest and relevance of research in the field of creating and ensuring effective enterprise ecosystems can be attributed to objective reasons. Firstly, through the remarkable results achieved by ecosystems. For instance, 7 out of the 10 largest companies in the world employ the concept of ecosystems. According to the BCG Henderson Institute's 2022 analysis, companies operating on the principles of the ecosystem include Alphabet, Amazon, Apple, Facebook, Microsoft, Alibaba, and Tencent (Jafarov & Szakos, 2022).).

The second reason for the creation and development of entrepreneurial ecosystems is the transformation of traditionally structured industry markets. According to research conducted by "Accenture" analysts, it's noteworthy that ecosystems serve as a catalyst for reshaping various industries, leading to "tectonic shifts" among them. Seventy-six percent of surveyed business leaders agree that over the next 5 years, business models will undergo re-engineering due to the impact of ecosystems (Velt et al., 2020).

Thirdly, the enterprise ecosystem model also appeals to companies that are not necessarily aiming for leadership positions in global rankings. Their goal is to achieve and sustain a high level of competitiveness. In the face of turbulent changes, many companies struggle to operate independently. They require collaboration with partners, involving the sharing of unique technologies, databases, customer information, key competencies, and mechanisms for commercializing innovations. The formation of enterprise ecosystem enables increased flexibility and reduces the time required for making relevant management decisions, obtaining necessary infrastructure support, distributing risks, and converting the knowledge and skills of human resources into new technologies.

Entrepreneurial ecosystem is an adaptive form of partnership among actors from various sectors of the economy. It integrates the outcomes of interdisciplinary research and development to collaboratively address complex problems, primarily of a practical nature.

A key condition for the formation and successful implementation of entrepreneurial ecosystem projects is the presence of a project initiator who is deeply committed to its success, along with a favourable environment that offers free market access, financial and other forms of support, as well as knowledge and information. Thanks to the systemic functions of entrepreneurial ecosystem, the potential for development among actors increases, leading to the emergence of new forms of multi-vector cooperation within the context of economic transnationalization. On the other hand, the likelihood of entrepreneurial ecosystem's survival also increases as its participants' social, economic and environmental efficiency grows.

The term "enterprise ecosystem" is most closely related to the term "innovation ecosystem". The conceptual foundations of enterprise ecosystems are presented in studies of regional innovation systems, which emphasize the interconnection of formal and informal institutions and innovative developments.

A number of researchers, such as Echterhoff, and Amshoff (2013), Poetz, and Prügl (2019), have studied the impact of inter-sectoral interaction within industries on the results of innovation activities. As noted by authors N. Echterhoff and B. Amshoff (2013), there is a need to explore new ways of leveraging production potential to innovate. Creating dynamic entrepreneurial ecosystems based on innovation is one way to address this problem.

At various times, researchers have emphasized the necessity of eliminating inter-sectoral barriers to stimulate the innovation process (Spigel, 2020). This involves combining unique knowledge and resources from different industries, as well as facilitating free technology transfer. This thesis is corroborated by Farhadi's (2019) published book, "Cross-Industry Ecosystems", in which the author elaborates on the theoretical and methodological foundations of the new concept. Farhadi (2019) emphasizes the complexity and necessity of inter-sectoral economic growth.

Synthesizing the essence of the enterprise ecosystem, it can be defined as a localized spatial complex comprising hierarchical structures, business processes, and infrastructure facilities that interact to create the necessary conditions and a conducive environment for generating new resource combinations and facilitating knowledge transfer to commercialize innovations. Today, the formation and development of entrepreneurial ecosystems are prioritized, driven by the necessity to consider the interdisciplinary nature of modern innovations, the practical value of multidisciplinary competences, and the importance of inter-sectoral collaboration.

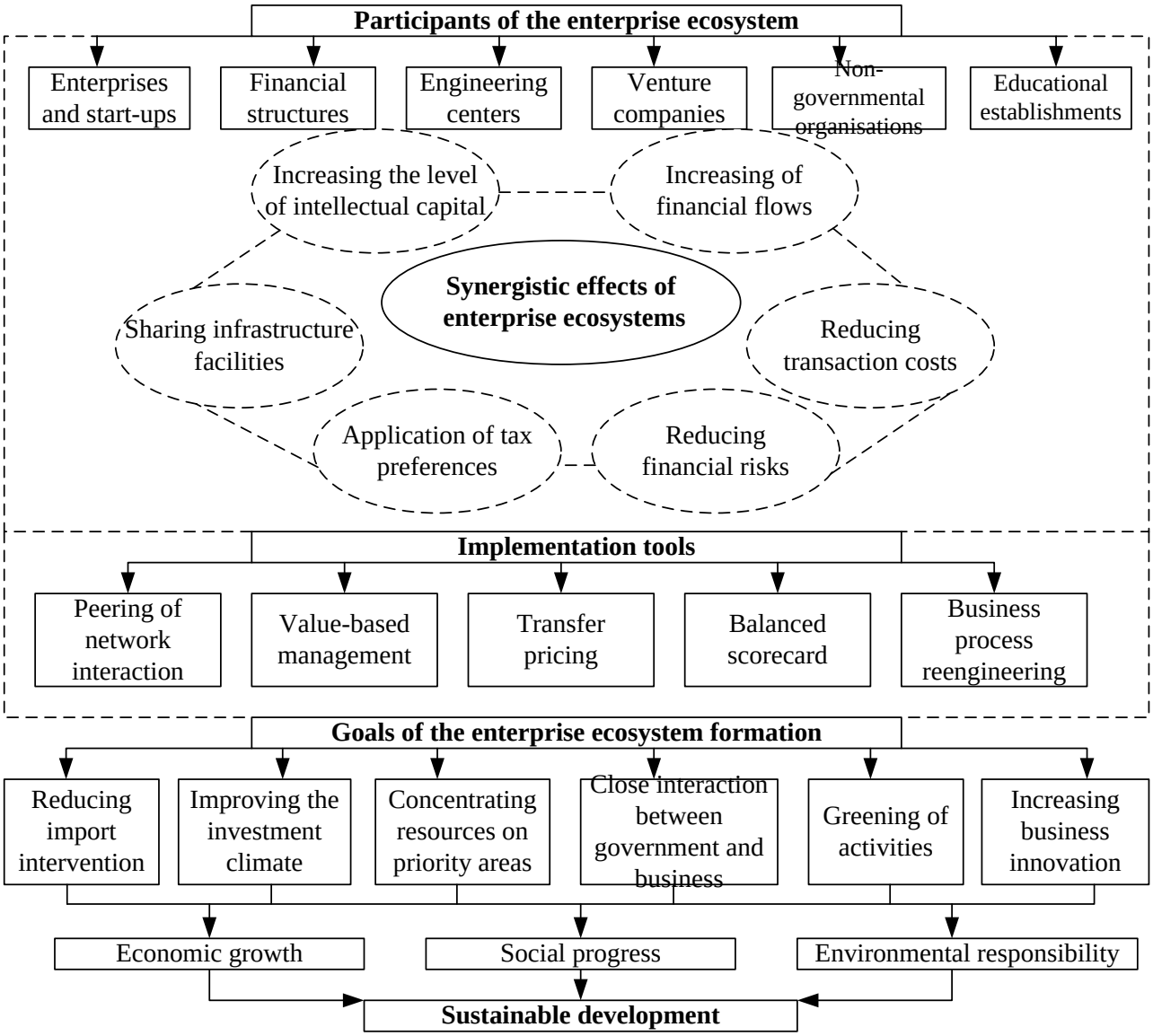
It is worth noting that entrepreneurial ecosystems do not have territorial boundaries - cooperation is carried out by participants from different territories and industries. Enterprise ecosystems do not have a defined timeframe - the interaction of specific participants is carried out in accordance with the requirements of innovative engineering projects. The consolidating factors of the enterprise ecosystem are key competencies, unique knowledge, the latest technologies and relevant information. The environment formed based on the principles of the ecosystem model enables each participant to effectively achieve their digitization goals, initiating, developing, and implementing innovative technologies and business processes, thereby achieving a powerful synergistic effect.

The trend of ecosystem integration contributes to the formation of an environment for the active development of centers of social and economic growth and ecological balance, fostering synergies through cooperation between enterprises and organizations in the value creation process.

The theoretical and practical aspects of forming enterprise ecosystem within the framework of sustainable development are summarized in the developed synergistic model (Figure 1).

Figure 1

The synergistic model of the enterprise ecosystem within the framework of sustainable development



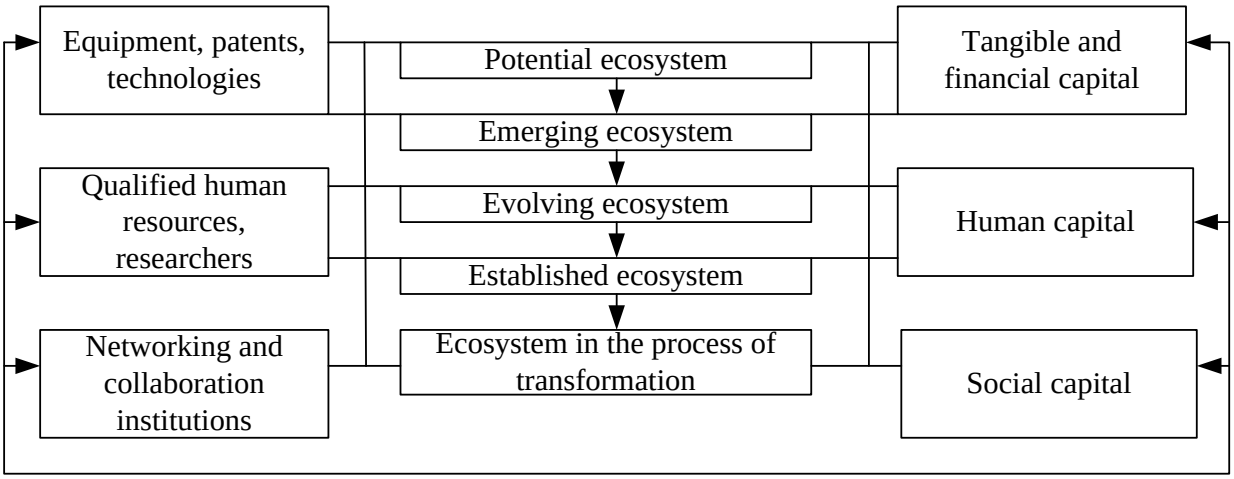
Source: created by the author

The presented model illustrates the transition from rigid management to flexible network structures, highlighting opportunities for integrating sustainable practices into business processes, diversifying activities, and outlining strategies for the balanced utilization of resources and productive collaboration among ecosystem participants. These efforts aim to leverage the competitive advantages of participants and achieve synergistic outcomes within the framework of sustainable development.

Each ecosystem goes through certain stages in its development, which differ depending on the participants, the specifics of cooperation and intra-network connections. However, we can identify a general model of ecosystem development consisting of the following stages (Figure 2).

Figure 2

The main stages of ecosystem development



Source: created by the author

It is advisable to consider the main stages of the ecosystem life cycle in more detail.

The first stage, a potential ecosystem, begins as a local concentration of enterprises in related and interdependent industries. There are agglomeration effects, but no integration mechanisms. The concentration of enterprises in one area causes competition and, at the same time, stimulates the development of technologically related enterprises. At the same time, if there are technological and organizational linkages between integrated industries that can become sources of productivity and competitiveness, enterprises are looking for ways to implement and commercialize them. This moment can be the impetus for the development of the ecosystem.

The second stage is an emerging ecosystem. Competition between producers in the basic industry is reaching a noticeable level, and its pressure is forcing them to look for new forms and strategies of competition. The search is driven by innovations in the end-user value chain. Dynamic competition within the system results in increased specialization in line with the needs of the underlying industry, improved quality of raw materials, improved equipment and specialized services, and the development of employee competence. An important result is the beginning of close personal contacts between entrepreneurs participating in the ecosystem.

The third stage is an evolving ecosystem. It is characterised by a high level of competition between manufacturers of the final product, developed markets for raw materials, equipment and skilled workers. New formal and informal cooperation institutions, non-governmental organizations, and websites related to participating companies and the industry are emerging. The third stage may be driven by the emergence of new ecosystem participants, as the complex of interconnected ecosystem enterprises is assessed as attractive for investment. An innovation and source of development may be the involvement of enterprises from new industries that are part of a vertical integration chain or have horizontal links.

The fourth stage is an established ecosystem. At this stage, the collaborative effects should be pronounced. The ecosystem is highly competitive, innovative and environmentally friendly. A high degree of vertical and horizontal integration has been achieved; markets for end products, raw materials, equipment, and human resources are highly developed; and

effective information exchange mechanisms are in place. Stimulating factors of development are a high level of competition and cooperation within the ecosystem, maximization of economic, social, cultural, qualification ties and protection of environmental interests.

The fifth stage is a transforming ecosystem. It is characterized by a change in the form and properties of the ecosystem in response to environmental challenges. In order to function successfully in the new environment, the ecosystem should develop and perform new technical, product, information and management solutions, improve environmental standards, and implement improved social and economic principles of ecosystem functioning.

It should be added that the dominant idea initiating the formation of an ecosystem can often be the production and implementation of an innovative project, the creation of a new product or technology, the development of digital platforms, etc. At the same time, one company can participate in several ecosystems simultaneously, implementing various projects, being, for example, a customer, a supplier of unique resources or a contractor of various projects

Based on a preliminary analysis of the theoretical aspects of ecosystem theory, we propose key development vectors that enterprises need to implement in order to achieve sustainable development goals, synergistic effects, intensify innovative growth, and ensure the leadership position of entrepreneurial ecosystem in economic, social, and environmental aspects:

- creation of a unified enterprise information environment and information management system. The utilization of algorithms and software to generate, transform, interpret information, and predict the development of business processes is essential for enhancing the efficiency of enterprise ecosystems in the digital age;
- formation of innovative business processes. Special spaces such as accelerators, corporate innovation centers, and laboratories are being created and actively function to model the business processes of modern ecosystems. They serve as the foundation and key drivers of the new digital economy;
- implementation of digital reverse engineering requires a set of technologies, hardware, and software tools. These tools are necessary for obtaining a digital model of a finished product, enabling further improvement or modernization;
- ensuring energy efficiency within the ecosystem of enterprises involves certifying them according to LEED and BREEAM standards, which in turn leads to reduced operating costs;
- establishing cross-industry cooperation, interacting with partners in professional associations and consortia, and collaborating with other ecosystems to organise social, economic and technological partnerships;
- implementation of a customer-centric approach to management. The collection, analysis, and intensive utilization of customer knowledge, coupled with a strong customer focus, serve as critical tools for creating competitive advantages within the enterprise ecosystem;
- developing HR partnership system is essential for maximizing the productive potential of human resources in addressing key tasks, implementing business functions, and optimizing production processes through effective cooperation and efficient communication;

- introducing the concept of lean manufacturing serves as a tool to optimize business processes, aiming to eliminate various losses in the functioning of the enterprise ecosystem.

The purpose of implementing the proposed vectors is to ensure the continuous development and flexibility of participants within the enterprise ecosystem. This involves preparing them for ongoing adaptation to turbulent environmental conditions and accelerated technology diffusion. It also entails implementing new technological architecture solutions, fostering organizational learning, and creating a decision-making system that utilizes data from the product life cycle, supply chain, and all business processes.

CONCLUSIONS

Thus, to summarize the above, we can conclude that in recent years, the most effective functioning of enterprises has been ensured by ecosystem-based optimization, and the concept of ecosystems has gained both scientific and practical recognition. As emphasized by Wurth, Stam, and Spigel (2021), the most effective use of the capabilities of the enterprise ecosystem is possible only with a comprehensive program. This program should include the creation of active partnerships, intensification of the digital transformation of business entities, involvement of the research community, allocation of resources, and favourable tax regulation to create investment incentives. At the same time, the priority task is to establish a productive integration between the participants of enterprise ecosystem. This involves identifying priority areas of development to ensure a synergistic effect.

Moreover, enterprise ecosystem plays a vital role in fostering an ethic of sustainable development, which encompasses developing a conscientious attitude toward the environment as the foundation of life. This includes observing the laws of its development, as well as adhering to restrictions and prohibitions. Additionally, it entails cultivating an ethic of efficient management, rational consumption, and a healthy lifestyle.

The article examines various theoretical approaches to defining the concept of an “ecosystem”, upon which the author presents their interpretation. It is argued that the ecosystem offers optimal pathways and effective tools for fostering innovative economic growth based on the principles of sustainable development.

The article presents a synergistic model of the entrepreneurial ecosystem. The key features of this model include: cross-industry interaction, which maximizes synergistic effects more effectively than corporate ties; diversification of activities with a focus on creating frugal innovations; environmentalization of activities alongside the commercialization of developments; mobility and flexibility of business processes; and autonomy of participants with a commitment to voluntary cooperation principles."

It should be emphasized that the priority of ecosystem sustainable development implies a shift in focus from economic to ecological and social concerns, as well as from material to spiritual and informational values. Besides, it involves harmonizing society’s interaction with the environment. That is why there is an urgent need to form a new ecosystem model of economic development. This model should be based on the dominance of elements such as partnership between business structures and the state, broad and diversified support for the innovation activity of enterprises, and greening of activities with efficient resource consumption.

The prospects for further research lie in developing recommendations for the formation and functioning of enterprise ecosystems in specific regions and industries. The unique characteristics of each territory and business processes necessitate an individualized approach to establishing new ecosystems

REFERENCES

1. Adner, R. (2017). Ecosystem as Structure: an Actionable Construct for Strategy. *Journal of Management*, *43*(1), 39-58. https://doi.org/10.1177/0149206316678451
2. Adomavicius, G., Bockstedt, J., Gupta, A., & Kauffman, R.J. (2007). Technology Roles and Paths of Influence in an Ecosystem Model of Technology Evolution, *Information Technology and Management*, *8*(2), 185-202. https://doi.org/10.1007/s10799-007-0012-z
3. Alvedalen, J., & Boschma, R. (2017). A Critical Review of Entrepreneurial Ecosystems Research: Towards a Future Research Agenda. *European Planning Studies*, *25*(6), 887-903. https://doi.org/ 10.1080/09654313.2017.1299694
4. Autio, E., & Thomas, L.D.W. (2014), *Innovation Ecosystems: Implications for Innovation Management*. Oxford: Oxford University Press.
5. Bergman, E.M., & Feser, E.J. (1999). Industrial and Regional Clusters: Concepts and Comparative Applications. Reprint. Edited by Scott Loveridge and Randall Jackson. WVU Research Repository, 2020. https://researchrepository.wvu.edu/cgi/viewcontent.cgi?article=1004&context=rri-web-book
6. Cohen, B. (2006). Sustainable Valley Entrepreneurial Ecosystem. *Business Strategy and the Environment*, 15(1), 1-14. https://doi.org/10.1002/bse.428
7. Cooke, P. (1996). The New Wave of Regional Innovation Networks: Analysis, Characteristics and Strategy. *Small Business Economics*, *2*, 159-171. https://doi.org/ 10.1007/BF00394424.
8. Echterhoff, N., Amshoff, B., & Gausemeier, J. (2013). Cross-Industry Innovations – Systematic Identification and Adaption. *International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering*, *7*(4), 606-616. https://zenodo.org/records/1083853
9. Farhadi, N. (2019). *Cross-Industry Ecosystems: Grundlagen, Archetypen, Modelle und Strategische Ansätze*. Verlag: Springer Fachmedien Wiesbaden GmbH.
10. Hite, J.M., & Hesterly, W.S. (2001). The evolution of Firm Networks: From Emergence to Early Growth of the Firm. *Strategic Management Journal*, *3*, 275-286. https://doi.org/ 10.1002/smj.156.
11. Isenberg, D.J. (2010). How to Start an Entrepreneurial Revolution. *Harvard Business Review*, *12*, 40-50. https://hbr.org/2010/07/how-to-start-an-entrepreneuria
12. Jafarov, N., & Szakos, J. (2022). Review of entrepreneurial ecosystem models. *ASERC Journal of Socio-Economic Studies*, 5(1), 3-16. DOI:10.30546/2663-7251.2022.5.1.3
13. Mason, C., & Brown, R. (2015). *Entrepreneurial Ecosystems and Growth Oriented Entrepreneurship*. Final Report to OECD. Paris: OECD.
14. Moore, J.F. (1998). The Rise of a New Corporate Form", *Washington Quarterly*, *21*(1), 167-181. https://doi. org/ 10.1080/01636609809550301
15. Muegge, S. M., & Mezen, M. (2017). Business ecosystems and new venture business models: an exploratory study of participation in the Lead to win job-creation engine.

International Journal of Technology Management, *75*(1-4), 157-192. https://doi.org/ 10.1504/IJTM.2017.085700.

16. Poetz, M.K., & Prügl, R. (2019). Crossing Domain-Specific Boundaries in Search of Innovation – Exploring the Potential of Pyramiding. *Journal of Product Innovation Management*, *27*(6), pp. 897-914. DOI:10.1111/j.1540-5885.2010.00759.x

17. Rothschild, M. (1991). *Bionomics: Economy as Ecosystem*. New York: Henry Holt and Company Inc.

18. Smolović, S., Živanović, S., Abramović, N., Živanović M. (2023). Management of Sustainable Development and Environmental Protection. *Agora International Journal of Economical Sciences*, *17*(2), 142-157. https://doi.org/10.15837/aijes.v17i2.6452

19. Spigel, B. (2020). *Entrepreneurial Ecosystems: Theory, Practice and Futures*. Edward Elgar Publishing.

20. Spilling, O.R. (1996). The Entrepreneurial System: on Entrepreneurship in the Context of a Mega-event", *Journal of Business Research*, *36*(1), 91-103. https://ideas.repec.org/a/eee/jbrese/v36y1996i1p91-103.html

21. Valdez, J. (1988). *The Entrepreneurial Ecosystem: Toward a Theory of New Business Formation*. San Antonio: University of Texas.

22. Velt, H., Torkkeli, L., & Laine, I. (2020). Entrepreneurial ecosystem research: Bibliometric mapping of the domain. Journal of Business Ecosystems (JBE), *1*(2), 1-31. https://doi.org/ 10.4018/JBE.20200701.

23. Wurth, B., Stam, E., & Spigel, B. (2021). Toward an Entrepreneurial Ecosystem Research Program. *Entrepreneurship Theory and Practice*, *46*(3), 729-778. https://doi.org/10.1177/1042258721998948.