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Cooperation Between Higher Education Institutions, Business and Government as a Form of Economic Interaction of Key Stakeholders in Creating an Innovative Economy

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ABSTRACT

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The article examines the processes and strategic consequences of cooperative interaction between higher education institutions, the business environment and government institutions within the economy of Ukraine. The purpose of the study is to form strategic directions of innovation cooperation to identify ways to strengthen the national innovation system and increase the country's competitiveness. The methodological basis of the study is formed by the integration of systemic, institutional and comparative approaches, which allowed for a comprehensive study of the relationships between education, science and innovation. The methods of structural-logical analysis, content analysis of regulatory legal acts of Ukraine and generalization were applied to formulate conceptual provisions on the strategic interaction of stakeholders. The obtained scientific results showed that the concept of the "knowledge triangle" defines the synergistic interaction of higher education institutions as generators of knowledge, business as a mechanism of commercialization and government as an institutional coordinator, forming the basis of the national innovation ecosystem. Key models of cooperation are identified – triple helix, academic-industrial partnerships, innovation clusters, technology parks and regional hubs, which ensure technology transfer and the development of high-tech entrepreneurship. Strategic development directions, innovative decentralization, transformation of universities into entrepreneurial ones, expansion of public-private partnerships and digital platforms for joint research are substantiated. The practical value of the study lies in the possibility of using the proposed models and algorithms to develop regional innovation strategies, improve the regulatory framework and create effective mechanisms for commercializing scientific results. The results can be implemented by government bodies, higher education institutions and business structures to strengthen regional ecosystems and increase the economic efficiency of cooperation. Prospects for further research are associated with an empirical assessment of the effectiveness of the implementation of Smart Specialization in individual regions of Ukraine and monitoring the impact of entrepreneurial universities on the growth of the number of spin-offs.

KEYWORDS

innovation ecosystem, cooperation, smart specialization, entrepreneurial universities, innovative decentralization, technology transfer, public-private partnership, economic interaction.








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СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

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Кооперація закладів вищої освіти, бізнесу та влади як форма економічної взаємодії ключових стейкхолдерів у створенні інноваційної економіки

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СТАТТЯ

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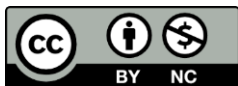
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Стаття досліджує процеси і стратегічні наслідки кооперативної взаємодії між закладами вищої освіти, бізнес-середовищем та владними інституціями в межах економіки України. Мета дослідження полягає формуванні стратегічних напрямів інноваційної кооперації з метою виявлення шляхів посилення національної інноваційної системи та підвищення конкурентоспроможності країни. Методологічна база дослідження сформована інтеграцією системного, інституційного та компаративного підходів, що дозволило комплексно вивчити взаємозв'язки між освітою, наукою та інноваціями. Застосовано методи структурно-логічного аналізу, контент-аналізу нормативно-правових актів України та узагальнення для формулювання концептуальних положень щодо стратегічної взаємодії стейкхолдерів. Отримані наукові результати показали, що концепція «трикутника знань» визначає синергетичну взаємодію ЗВО як генераторів знань, бізнесу як механізму комерціалізації та влади як інституційного координатора, формуючи основу національної інноваційної екосистеми. Виокремлено ключові моделі кооперації – потрійну спіраль, академічно-індустріальні партнерства, інноваційні кластери, технопарки та регіональні хаби, які забезпечують трансфер технологій і розвиток високотехнологічного підприємництва. Обґрунтовано стратегічні напрями розвитку, інноваційну децентралізацію, трансформацію університетів у підприємницькі, розширення державно-приватного партнерства та цифрові платформи спільних досліджень. Практична цінність дослідження полягає в можливості використання запропонованих моделей і алгоритмів для розробки регіональних інноваційних стратегій, удосконалення нормативно-правової бази та створення ефективних механізмів комерціалізації наукових результатів. Результати можуть бути імплементовані органами влади, ЗВО та бізнес-структурами для посилення регіональних екосистем і підвищення економічної ефективності кооперації. Перспективи подальших досліджень пов'язані з емпіричною оцінкою ефективності впровадження Smart Specialisation в окремих регіонах України та моніторингом впливу підприємницьких університетів на зростання кількості спін-офів.

КЛЮЧОВІ СЛОВА

інноваційна екосистема, кооперація, смарт-спеціалізація, підприємницькі університети, інноваційна децентралізація, трансфер технологій, державно-приватне партнерство, економічна взаємодія.

1. Introduction

The development of Ukraine's innovative economy in the context of war and post-war transformations is of decisive strategic importance, since it is innovation activity that is able to ensure the structural reconfiguration of the national economy, increase its resistance to exogenous shocks and form the basis for long-term economic progress during the reconstruction period. Transformational phenomena determined by the large-scale destruction of infrastructure facilities, modification of global production networks, accelerated digital transformation and growing demand for high-tech solutions necessitate the construction of a new paradigm of economic development based on intellectual resources, knowledge capital and the capacity of society to generate and commercially implement innovations. Under such circumstances, the modernization of the institutional architecture, which regulates the relationships of key actors in the innovation process, becomes especially relevant because the effectiveness of this interaction directly correlates with the pace of state recovery and its incorporation into global technological spaces.

The need to intensify cooperation between higher education institutions, the private sector and government agencies is a prerequisite for the formation of an effective innovation ecosystem, since these three categories of subjects provide a full-fledged cycle of knowledge transformation – from its production to implementation in production processes and scaling at the national and international levels.

2. Literature Review

A systematic review of the scientific discourse demonstrates that the issue of cooperation between university institutions, the private sector and public bodies occupies a central place in the study of innovation dynamics. In the scientific works of Podolchak N. et al. [9], Ponomarenko V. et al. [10], it is emphasized that the interaction of the subjects of the innovation ecosystem determines the production of new knowledge, technological progress and strengthening of the economic capacity of territorial entities. Scientists state that universities are increasingly acquiring the status of centers for generating innovations, while the business environment functions as a leading tool for commercialization and practical implementation of scientific achievements, and management structures form an institutional environment for strategic coordination.

Research by Bebko S. [2], Lazarenko Y. [11], Makedon V. et al. [15] focus on the triple helix model, which conceptualizes innovative development through the prism of the interaction of three institutional actors – universities, the industrial sector and the state. Alternative scientific research Orzhel O. and Chankotadze Y. [17], Skyba Y. [21], investigate the functional role of regional innovative cluster formations and research centers formed around higher education institutes and technological corporations. Scientists, such as Krupka M. et al. [12], Yashchyshyna I. [23] emphasize the importance of the concept of reasonable specialization and its impact on the formation of competitive advantages of territories, as well as highlight the key role of entrepreneurial universities in the transformation of the higher education system. In general, a critical analysis of the scientific literature confirms the thesis that the synergistic interaction of educational, scientific, and business spheres is a critical factor in Ukraine's innovative progress in the context of global competition.

3. Problem Statement

The purpose of the article is to substantiate the normative, organizational and institutional foundations for ensuring cooperation in the format of "HEI-business-power" for Ukraine.

4. Methods and Materials

The methodological basis of the study is designed based on the integrated application of systemic, institutional, and comparative approaches, which enables the examination of the multifaceted relationship between higher education institutions, the private sector, and government agencies in the context of building a national innovation ecosystem. The methods of structural and logical analysis for

the identification of intra-system and intersectoral relationships in the three-tier model “education – science – innovation”, as well as the method of generalization to formulate conceptual provisions for strategic cooperation, have been implemented. The involvement of content analysis of legislative and regulatory acts made it possible to establish regulatory characteristics of the functioning of the innovation system; at the same time, a comparative analysis of international partnership models contributed to the identification of relevant practices suitable for implementation in the Ukrainian context.

5. Results and Discussion

The concept of the “knowledge triangle”, which integrates education, science and innovation into a single dynamic system for creating and disseminating new knowledge, is defined by us as a fundamental reference point for countries seeking to gain a sustainable position in the global economy. It is in Ukrainian realities that it acquires special significance, as it determines the logic of interaction between key stakeholders capable of ensuring national competitiveness through the systemic transformation of knowledge production modes, their practical application and dissemination in the context of continuous technological changes. The above concept assumes that each of the three elements – education, science and innovation, cannot function autonomously, but can be in a constant mutual exchange of resources, results and competencies, at the same time forming a synergistic model in which the development of one segment determines the intensity of development of the rest. Moreover, this dependence is especially noticeable in national innovation systems, where the uneven development of at least one component leads to chain dysfunctions in the entire system.

Within the framework of this concept, higher education institutions form the intellectual core of society, because they create new knowledge, produce scientific results, provide training of specialists with research and innovation competencies, and fulfill an important social mission – support for the cultural, technological and economic development of the country. This part is provided through the modernization of educational programs, the integration of the latest scientific results into the educational process and active participation in the formation of regional innovation ecosystems. Business in this triangle plays a critical role as a “mechanism for the materialization of knowledge”, since it is enterprises/companies that have the opportunity and technological base to transform scientific developments into products, services and technologies that form the innovative potential of the national economy. The entrepreneurial sector is a source of demand for applied scientific results and competencies, only it forms technological challenges with which HEIs and scientific institutions must cooperate and adapt their research areas [6]. Business provides commercialization processes that determine the viability of innovations, because without an effective mechanism of market implementation, even the most promising scientific discoveries remain unrealized, which is especially important for Ukraine, where the indicators of commercialization of research are still low compared to the world’s leading innovative economies within the framework of economic interaction.

Accordingly, the state plays the role of an institutional coordinator capable of harmonizing the interests of universities, business and society through the development of policies, regulations, support programs and financial instruments that stimulate cooperation, development of R&D infrastructure, modernization of the educational sector and integration of Ukrainian innovative institutions into the global scientific space. The Law of Ukraine “On Innovation Activity” is a basic document that prescribes the legal foundations of the innovation system of the state, defines the concept of innovation, innovative product, innovation project, its life cycle, mechanisms of state support and economic stimulation, and also creates a regulatory basis for organizing interaction between subjects of innovation activity, among which higher education institutions and scientific institutions occupy an important place [7]. The Law not only enshrines the principles of state policy in the field of innovation, but also promotes the integration of science and production, as it establishes legal mechanisms for financing innovation projects, provides an opportunity to create special innovation structures and defines forms of state support, including tax incentives, investment grants, subsidies and targeted lending [14]. The law also forms legal conditions for the development of partnerships between business, higher education institutions and public authorities, as it provides for joint financing of projects, pooling of material and intellectual resources, integration of educational programs and research infrastructure. In addition, the processes of stimulating the commercialization of scientific research results, as well as the development

of knowledge-intensive entrepreneurship, which is an important element of the national innovative economy, are provided.

The Law of Ukraine “On Scientific and Scientific-Technical Activities” complements innovation legislation, as it regulates the status of science in Ukraine, determines the principles of organization of scientific activity, establishes the rights and obligations of scientists, sets the rules for the functioning of scientific institutions, and also forms an institutional mechanism of state policy in the field of science and technology. Within the framework of the law, the role of higher education institutions is defined as leading subjects of scientific activity, capable of ensuring the generation of new knowledge, the development of scientific schools, the training of researchers and scientific and pedagogical personnel, as well as creating conditions for the integration of science with production through joint research and projects [8]. The Law enshrines the principle of autonomy of scientific entities, defines the system of financing science (basic, competitive, grant), establishes mechanisms for the integration of Ukrainian science into the European Research Area and sets the legal framework for the creation of innovative structures based on universities, which contributes to the development of the technology transfer system, commercialization of research results and the formation of partnerships with business.

Another basis of regulatory and legal support is the Law of Ukraine “On Higher Education”, which contains provisions on the legal, organizational and financial principles of the functioning of universities, establishes the principles of autonomy, academic freedom, institutional responsibility and guarantees of the quality of education, and also determines the place of universities in the national innovation system. The Law forms the basis for the creation of scientific collaborations based on higher education institutions, regulates the issues of joint use of property, joint research, conclusion of partnership agreements with enterprises, and also defines the mechanisms of dual education that contribute to the integration of business into personnel training and modernization of educational programs. This law also outlines the rights of higher education institutions to create startups, economic structures and innovative enterprises, which determines the principles for them to participate in the commercialization of research results and be active participants in economic activity in innovation sectors [18].

The Strategy for Innovative Development of Ukraine complements these provisions, as it details the mechanisms for the functioning of the innovation system, defines the institutional architecture of innovation support, from incentives for scientific research to the development of startup infrastructure, and forms a list of policy instruments that will be aimed at the development of innovation activities, including financial incentives, regulatory support for innovation clusters, public administration reform in the field of science and technology, as well as development of the legal system of intellectual property protection. The strategy provides for strengthening the role of universities as centers of innovative development, creating a network of regional innovation platforms, supporting academic and industrial partnerships, and developing joint research projects based on business needs (Fig. 1).

The mechanisms and models of cooperation of these participants form a complex multi-level system of interaction, which is based on the permanent exchange of knowledge, resources and management decisions. For these reasons, academic-industrial partnerships are an element of this system, as they provide not only technology transfer, but also the formation of an environment for innovative creativity, commercialization of research and development of high-tech entrepreneurship. Joint research projects developed in the format of a partnership between universities and enterprises can combine academic potential with applied production needs, and cooperation often takes place in areas where the country feels the greatest need for innovation: materials science, mechanical engineering, biotechnology, IT sector, energy and agro-industrial complex, etc. University scientists offer methodological depth, access to laboratory facilities and basic research, while business provides opportunities for practical validation, prototype testing, scaling of technological solutions, and market entry, which turns such projects into an effective mechanism for accelerated innovation dynamics [2].

Such partnerships become quite effective in the format of innovation laboratories and R&D centers, which are created at higher education institutions with the participation of industrial partners and act as platforms for experimental research, development of high-tech products and applied testing necessary for the transformation of scientific hypotheses into commercial innovation. In Ukrainian realities, such centers are not only platforms for scientific developments, but also centers for the formation of a culture of innovative thinking and entrepreneurial competencies among students and

young scientists, which makes it possible to build a natural chain “education, → research, → startup → production” [1].

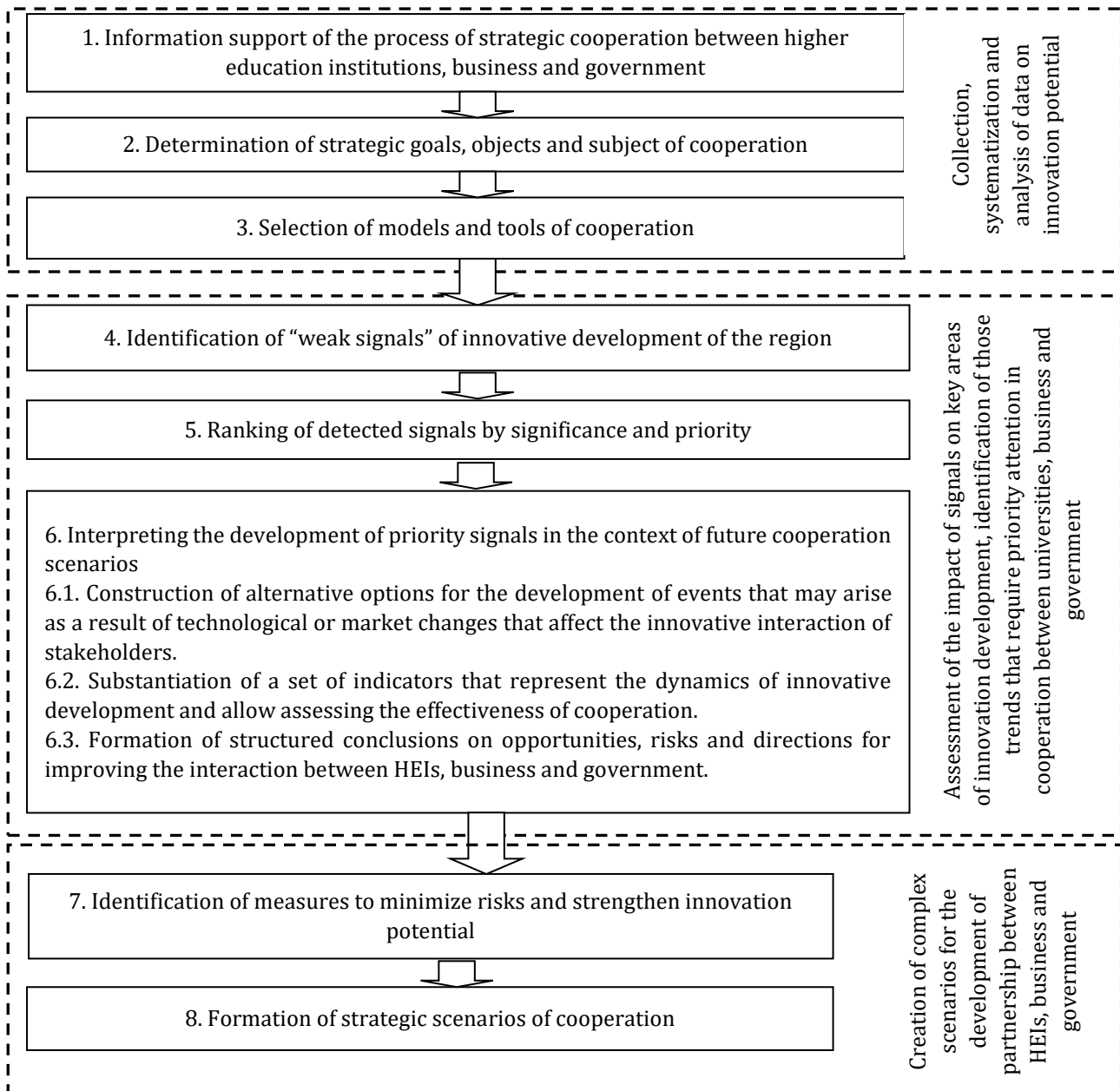


Figure 1. Level Processes of Strategic Cooperation of Higher Education Institutions, Business and Government in the Context of the Formation of an Innovation Ecosystem

Source: Developed by the authors.

Quite indicative for Ukraine are the examples of duets “university → industrial enterprise”, where the practice of cooperation is based on the long-term interests of both parties. Thus, the partnership between the higher education institution “KPI. Igor Sikorsky” and aviation and defense enterprises is aimed at joint research in the fields of aerospace technology, unmanned systems, composite materials and digital technologies, which allows combining academic basic research with applied engineering developments and the creation of serial technological solutions. Lviv Polytechnic actively cooperates with IT companies and industrial enterprises in the fields of automation, robotics and electronics, creating joint educational programs where students work on real production tasks. Kharkiv National University of Radio Electronics already has partnerships with companies in the telecommunications sector, combining training, research and practical developments in the field of communication technologies, artificial intelligence and cybersecurity [9].

In addition to academic-industrial partnerships, another plane of cooperation is being built – regional innovation ecosystems. They are formed through a set of tools to support innovation activities, coordinated by both state institutions and local communities. Industrial parks and technology parks are able to take on the role of ensuring the development of these ecosystems, as they create infrastructural conditions for the location of high-tech enterprises, conducting experimental research, organizing production lines and attracting investments to the region. An industrial park does not function only as an area with certain technical capabilities, instead it turns into an environment where enterprises interact with universities, research centers, investors and authorities, which provides a multiplier effect on the development of the local economy. Techno parks, in turn, have a greater innovation orientation, because they concentrate scientific laboratories, startup incubators, technology transfer centers and business offices, which allows you to carry out a full cycle of innovations – from an idea to a commercial product.

Techno hubs, in particular in the fields of digital technologies, biomedicine, aggrotech or robotics, form local networks of innovative actors, where universities, enterprises and local administrations work to solve common regional problems, including increasing the technological capacity of enterprises, developing human resources and creating new jobs in high-tech industries. An example is the initiative to develop innovation spaces in Lviv, Kyiv, Kharkiv, or Dnipro, where techno hubs act as centers of urban innovation policy and platforms for cooperation between startups, universities, and real business [19, p. 127–128].

The coordinating function in regional innovation ecosystems is performed by local governments, as they create regulatory, infrastructure and financial conditions for the development of entrepreneurship, attracting investments, implementing innovative solutions in the field of urban governance, as well as initiating cooperation programs with universities related to the development of Smart City, digitalization of utilities, energy efficiency, environmental monitoring and mobility. Local communities become active customers of innovations, contributing to the creation of local markets for high-tech products and creating a favorable environment for cooperation between the academic sector and business, as well as ensuring the long-term sustainability of innovation ecosystems, since support from the authorities reduces risks for investors and stimulates the development of enterprises [3, p. 15].

Clusters that unite enterprises, higher education institutions and research institutions on an industry or technological basis also play a system-forming role, as they optimize information exchange processes, accelerate knowledge transfer, and jointly solve the problems of technological gaps. In Ukraine, IT clusters are developing quite dynamically, which form an environment of high cooperation between higher education institutions, development companies and local authorities, which stimulates the creation of innovative infrastructure, the implementation of educational programs with a practical component, and the launch of startups (Table 1) [20]

Table 1. Models of Innovative Interaction of Higher Education Institutions, Business Environment and Government

Triple Helix	Constant exchange of knowledge, resources and personnel	Strategic planning and grant funding	Ordering applied research, co-financing	Knowledge generation, training, technology transfer
Academic-industrial partnerships	Long-term contracts for joint research and development	Tax Benefits and Government Support Programs	Investing in R&D, providing production sites	Scientific leadership, laboratory facilities, student engagement
Innovation clusters	Territorial concentration of actors of the same or related industries	Formation of the regulatory framework of the cluster, infrastructure subsidies	Joint investment in shared infrastructure	Scientific and methodological center, training of specialists for the needs of the cluster
Technoparks and science parks	Physical infrastructure at or near the HEI	Preferential tax regime for residents, co-financing of construction	Lease of premises, creation of subsidiaries	Park management, startup incubation, technology transfer
Regional Innovation Hubs	Multifunctional platforms for startups, laboratories and business incubators	Municipal Funding and Regulatory Easing	Mentoring, venture investment, pilot projects	Coordination of educational and scientific activities, interdisciplinary laboratories

Source: Systematized by the authors according to the data given in [4; 16].

The formation of perspective and strategic directions for the development of the subject economy may involve a deeper restructuring of the logic of interaction between key stakeholders of the innovation economy. Because it is their concerted actions that create the prerequisites for the development of high-tech sectors, attracting investments, increasing labor productivity, strengthening scientific potential and forming the state's competitive position in global markets, scaling innovations and creating stable mechanisms of economic growth (Fig. 2).

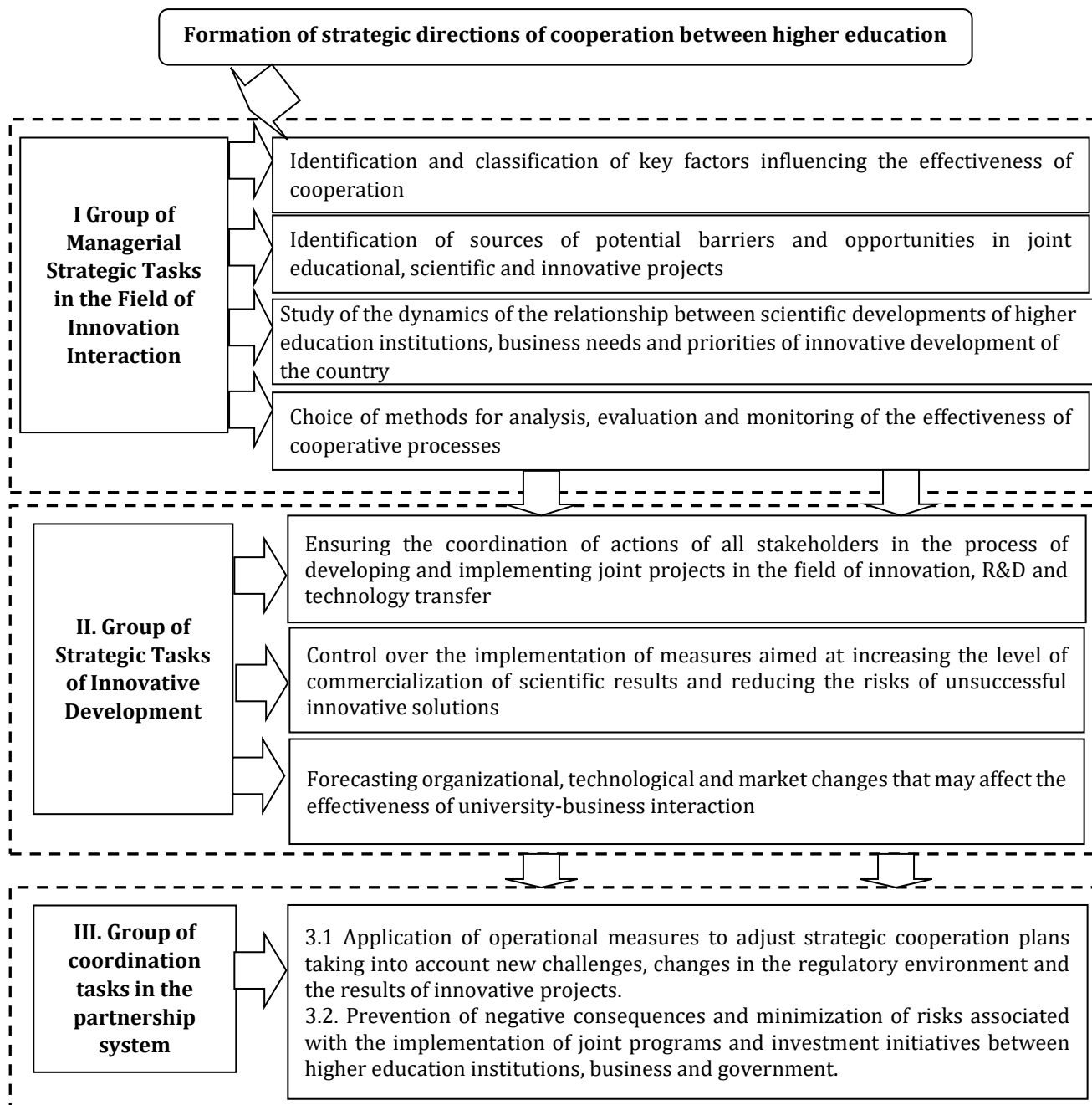


Figure 2. Structural model of formation of strategic tasks of interaction between HEIs, business structures and public authorities

Source: Developed by the authors.

In this vein, the implementation of the Smart Specialization (S3) concept, which enables the regions of Ukraine to identify their own technological and economic niches, is gaining weight. Within their framework, they can achieve the greatest innovative efficiency, which reorients fragmented innovation initiatives to systematically organized strategic platforms that are aimed at solving specific regional problems and using local advantages. Smart Specialization involves the involvement of a wide range of stakeholders: representatives of business, universities, technology parks, incubators, professional communities and government agencies, in the process of entrepreneurial discovery, within

which participants collectively identify technological areas that can ensure the growth of the region. In Ukrainian conditions, S3 is already proving itself as a tool that is really able to direct regional policy to those industry dominants where there is a real potential for a high-tech breakthrough: from agrobiotechnology in the central regions to aerospace and engineering technologies in the east, from IT and medical innovations in the west to logistics and innovation clusters in the southern regions [5, p. 10; 11].

Innovation decentralization as a strategic direction complements Smart Specialization, as it strengthens the capacity of local communities to independently form innovative strategies, manage resources and implement development policies in accordance with identified competitive niches, which creates a new level of autonomy for regions in terms of stimulating the innovation environment. Decentralization contributes to the emergence of local institutions – from public development funds to local technology parks, which will be able to promptly respond to the needs of enterprises and universities, create programs to support startups, and develop technological infrastructure. The expansion of the powers of local self-government bodies in innovation policy allows developing those areas that are most relevant to the local labor market and the economic structure of the community, creating conditions for greater involvement of universities in regional planning and implementation of innovation initiatives [12].

Against this background, the transformation of HEIs into “entrepreneurial universities” is of key importance, since it is the entrepreneurial university that becomes an institution capable of integrating academic, research and entrepreneurial functions into a single system that produces new technologies, promotes the commercialization of knowledge, forms startups, supports innovative entrepreneurship and creates human resources for strategically important sectors of the economy. An entrepreneurial university is not only a structure that creates startups or has a business incubator, but is an institution of a new type, based on the ability to create innovations through interaction with business and the state, as well as the ability to transform educational programs in such a way that they correspond to the dynamics of technological markets and global trends in the field of digitalization [22].

The creation of university hubs that bring together laboratories, research centers, business incubators, technology transfer centers and educational platforms allows for a continuous cycle of innovation activities, in which ideas arising from the educational or scientific process can be quickly transformed into prototypes, research projects or startups, and then scaled with the participation of business partners. These types of hubs play the role of multifunctional innovation centers in which students, teachers, entrepreneurs, investors and government officials interact in a common space, which contributes to the formation of a culture of interdisciplinarity, the development of technological entrepreneurship and the creation of an environment in which innovations become not an accidental product of individual efforts, but a natural result of systematic cooperation. University hubs also allow for the creation of network innovation platforms between different regions of Ukraine, deepening the integration of educational and scientific institutions into joint innovation projects, which strengthens the nationwide innovation system.

Cooperation incentives are a condition for supporting these processes, as they create economic incentives for enterprises and universities to be more actively involved in innovation activities, invest in high-tech projects, develop R&D infrastructure and participate in joint research (Table 2).

Public-private partnership (PPP) mechanisms are the next element of stimulating cooperation, as they allow combining the resources of the state, universities and business to implement large innovative projects, create infrastructure and implement technological solutions that require significant investments. PPPs can be used to create laboratory complexes, technology parks, centers for the collective use of scientific equipment, innovative campuses and research factories that provide universities and enterprises with access to infrastructure that they could not build on their own. Within the framework of PPP, joint educational and scientific programs can be implemented that train specialists for specific sectors of the economy, as well as dual education projects that help students acquire practical skills directly at enterprises [3, p. 15].

State grants and competitions for joint projects complement these tools, as they allow you to support exactly those areas in which the synergy between science, education and business can provide the maximum socio-economic effect. Grant support is aimed at stimulating interdisciplinary research, developing R&D teams, supporting startups, modernizing scientific laboratories, introducing technologies into production and creating innovative products that increase the competitiveness of

Ukrainian companies. In addition, competitions for joint projects allow universities to expand cooperation with enterprises and regional authorities, creating conditions for the formation of long-term partnerships.

Table 2. Prospects and Strategic Directions for the Development of Cooperation Between HEIs, Business Entities and Government Institutions

Strategic direction	Key Implementation Tool	Main stakeholders-initiators	Projected economic effect	Priority time horizon
Smart Specialisation (S3)	Entrepreneurial opening of priority niches in the region	Regional councils, higher education institutions, business associations	Concentration of resources on 3–5 strong sectors of the region	2025–2030
Transformation into entrepreneurial universities	Creation of technology transfer centers and startup studios	Ministry of Education and Science, Rectorate of Higher Education Institutions, Venture Funds	Growth in the number of university spin-offs by 150–200% by 2030	2025–2028
Innovative decentralization	Transfer of powers of local self-government bodies regarding innovation funds and benefits	Amalgamated territorial communities, regional state administrations	Increase in regional GDP at the expense of high-tech sectors by 8–12%	2026–2032
Development of public-private partnerships in large infrastructure	PPP for the construction of research campuses and laboratory complexes	Cabinet of Ministers, EBRD/EIB, large corporations	Creation of 15–20 new large R&D facilities by 2035	2027–2035
Digital platforms for collaborative research and transfer	Unified national application platform for joint projects and IP marketplace	Ministry of Digital Transformation, Ministry of Education and Science, IT companies	Reduction of time from idea to prototype by 40–60%, increase in patenting by 100%	2025–2029

Source: Developed by the authors.

Together, these areas determine the strategic path of development of the Ukrainian innovation ecosystem, in which universities, business and government form an integrated system capable of generating, scaling and commercializing innovations, ensuring the development of high-tech industries and strengthening Ukraine’s competitive position in the context of global economic competition.

6. Conclusions

The analysis shows that the effectiveness of the national innovation system is determined by the level of coordination of interaction between higher education institutions, the private sector and state structures. It has been established that the three-tier model “education – science – innovation” forms the foundation for sustainable economic progress, the formation of technological independence and the strengthening of the state’s competitive position at the global level. The analysis of the legislative framework of Ukraine demonstrates the existence of a legal basis for the implementation of knowledge and technologies in production processes, at the same time the need to strengthen institutional coordination between stakeholders through the improvement of financial mechanisms, creation of incentives for the commercialization of scientific results and the development of innovation infrastructure has been identified.

The results of the study confirm that academic and industrial alliances, innovative cluster formations, technology parks, regional centers and other configurations of cooperation function as defining structural elements that contribute to technology transfer, the formation of high-tech entrepreneurship, the activation of innovative activities of the business environment and the growth of human capital. It has been established that universities acquire the status of central institutions of the innovation ecosystem, implementing the functions of knowledge production, training qualified personnel, initiating startup projects and providing scientific and technological support to sectors of the economy that need technological updating. It is argued that the synergy of resources of higher education institutions, entrepreneurial structures and government institutions makes it possible to form new value chains, intensify the commercialization of scientific developments and increase the productivity of economic processes.

It has been determined that the strategic vectors of cooperation development – the concept of smart specialization, innovative decentralization, transformation of universities into entrepreneurial structures, development of public-private partnership and introduction of digital platforms for collective research – form an updated architectonic model of innovative development of Ukraine, aimed at concentrating resources, diversifying technological specializations and increasing the effectiveness of regional innovation ecosystems. It is substantiated that the implementation of these areas provides not only stimulation of research activity, but also the creation of stable mechanisms of commercialization, mobilization of investment resources and the formation of technologically capable territories.

References

1. Androshchuk, I. O., Horpynchenko, M. V., & Shchelnik, O. V. (2024). Vprovadzhennia prohresyvnnykh pidkhodiv do upravlinnia yakistiu u ZVO: naikrashchi praktyky inozemnykh krain [Implementation of the progressive approaches to quality management in HEIs: best practices of foreign countries]. *Efektivna ekonomika – Effective Economy*, (8). <http://doi.org/10.32702/2307-2105.2024.8.61> (in Ukrainian)
2. Bebko, S. V. (2022). Kontseptualni oriientyry stvorennia synerhetychnoho efektu konsolidatsii ta dyversyfikatsii resursiv pry realizatsii mekhanizmu upravlinnia kooperatsiieiu zakladiv vyshchoi osvity [Conceptual guidelines for creating a synergistic effect of resource consolidation and diversification in implementing the cooperation management mechanism of higher education institutions]. *Zhurnal stratehichnykh ekonomichnykh doslidzhen – Journal of Strategic Economic Studies*, (2), 8–21. <https://doi.org/10.30857/2786-5398.2022.2.1> (in Ukrainian)
3. Bilovitska, Yu. A. (2022). Mekhanizmy spivpratsi derzhavy ta biznesu v umovakh realizatsii derzhavnoi polityky staloho rozvytku “zelenoi” ekonomiky v Ukraini [Mechanisms of cooperation between the state and business under the implementation of the public policy of sustainable development of the “green” economy in Ukraine]. *Publichne upravlinnia ta mytne administruvannia – Public Administration and Customs Administration*, (Special Issue), 10–17. <https://doi.org/10.32782/2310-9653-2022-spec.2> (in Ukrainian)
4. Dmytryk, O. O., & Tokarieva, K. O. (Eds.). (2022). Hospodarska diialnist ta novitni tekhnolohii: aktualni problemy rehuliuвання v umovakh voiennoho stanu [Economic activities and modern technologies: current regulatory issues under martial law]. Kharkiv: NDI pravovoho zabezpechennia innovatsiinoho rozvytku NAPrN Ukrainy. (in Ukrainian)
5. Demchyshak, N. B., & Khylychenko, M. O. (2021). Startup-ekosystema: instytutysiini ta finansovi aspekty stymuliuвання rozvytku v Ukraini [Startup ecosystem: institutional and financial aspects of development stimulation in Ukraine]. *Investytsii: praktyka ta dosvid – Investments: Practice and Experience*, (13–14), 5–13. <https://doi.org/10.32702/2306-6814.2021.13-14.5> (in Ukrainian)
6. Zakon Ukrainy “Pro vyshchu osvitu” [Law of Ukraine “On Higher Education”] of July 1, 2014, No. 1556-VII. <https://zakon.rada.gov.ua/go/1556-18> (in Ukrainian)
7. Zakon Ukrainy “Pro innovatsiinu diialnist” [Law of Ukraine “On Innovation Activity”] of July 4, 2002, No. 40-IV. <https://zakon.rada.gov.ua/go/40-15> (in Ukrainian)
8. Zakon Ukrainy “Pro naukovu i naukovo-tekhnichnu diialnist” [Law of Ukraine “On Scientific and Scientific-Technical Activity”] of November 26, 2015, No. 848-VIII. <https://zakon.rada.gov.ua/go/848-19> (in Ukrainian)
9. Podolchak, N. Yu., Sokil, O. H., Nebesnyi, R. V., et al. (2023). *Innovatsiinyi rozvytok ZVO: rol R&D ta partnerstva z biznesom* [Innovative development of HEIs: the role of R&D and cooperation with business]. Lviv: Rastr-7. (in Ukrainian)
10. Ponomarenko, V. S., Maliarets, L. M., Vnukova, N. M., et al. (2024). *Innovatsiinyi rozvytok diialnosti subiektiv hospodariuvannia v umovakh voiennoho ta povojennoho stanu: teoriia, praktyka, analytika* [Innovative development of business entities under wartime and postwar conditions: theory, practice, analytics]. Kharkiv: KhNEU im. S. Kuznetsia. (in Ukrainian)
11. Lazarenko, Yu. O. (2024). Ekosystema innovatsii v Ukraini: suchasnyi stan ta stratehichni napriamy rozbudovy v umovakh voiennoho chasu [Innovation ecosystem in Ukraine: current state and strategic development directions under wartime]. In V. V. Khrapkina & K. V. Pichyk (Eds.), *Upravlinnia innovatsiynym rozvytkom sotsialno-ekonomichnykh system* (pp. 21–34). Kyiv: Kyiv-Mohyla Academy Publishing House. (in Ukrainian)
12. Levchenko, O. M., Tkachuk, O. V., & Tsarenko, I. O. (2017). Innovatsiino-intehrovani struktury v suchasni ekonomitsi: yikh klasyfikatsiia [Innovation-integrated structures in the modern economy: their classification]. *Efektivna ekonomika – Effective Economy*, (10). <http://www.economy.nayka.com.ua/?op=1&z=5791> (in Ukrainian)

13. Krupka, M., Demchyshak, N., & Shchurevych, O. (2023). Stymuliuvannia spivpratsi zakladiv osvity, nauky ta biznesu v umovakh tsyfrovizatsii i pisliavoiennoho vidnovlennia Ukrainy [Stimulating cooperation between education, science and business in the context of digitalization and Ukraine's postwar recovery]. *Svit finansiv – World of Finance*, (1), 57–70. <https://doi.org/10.35774/sf2023.01.057> (in Ukrainian)
14. Makedon, V., Myachin, V., Sokol, P., & Hordiichuk, S. (2025). Synchronization of marketing strategies with company restructuring. *Eastern-European Journal of Enterprise Technologies*, 2(13(134)), 71–81. <https://doi.org/10.15587/1729-4061.2025.326377>
15. Makedon, V., Myachin, V., Aloshyna, T., Cherniavska, I., Karavan, N. (2025). Improving the Readiness of Enterprises to Develop Sustainable Innovation Strategies through Fuzzy Logic Models. *Economic Studies – Ikonicheski Izsledvania*, 34(5), 165–179. https://archive.econ-studies.iki.bas.bg/2025/2025_05/2025_05_09.pdf
16. Makedon, V., Myachin, V., Kuriacha, N., Chaika, Yu., & Koptilyi, D. (2025). Development of strategic management of a corporation through the implementation of scenario analysis. *Scientific Bulletin of Mukachevo State University. Series “Economics”*, 12(2), 135–146. <https://doi.org/10.52566/msu-econ2.2025.135>
17. Orzhel, O., & Chankotadze, Ya. (2024). Vzaiemodiia zakladiv vyshchoi osvity ta hromadskykh orhanizatsii v umovakh zmin: dosvid SNU im. V. Dalia [Interaction of higher education institutions and civil society organizations under conditions of change: The experience of Dal University]. *Universytety i liderstvo – Universities and Leadership*, (17), 110–128. <https://doi.org/10.31874/2520-6702-2024-17-110-128>
18. Pastushenko, O. O. (2024). Naukovi parky v innovatsiinii infrastrukturi ZVO: umovy funktsionuvannia ta normatyvnoho rehuliuвання [Science parks in higher education innovation infrastructure: operational conditions and regulatory framework]. *Ekonomika ta suspilstvo – Economy and Society*, (62). <https://doi.org/10.32782/2524-0072/2024-62-43> (in Ukrainian)
19. Sahaidak, M. P., & Simshah, I. O. (2025). Rol stratehichnoho partnerstva u formuvanni ta rozvytku osvitnoi ekosystemy Ukrainy [The role of strategic partnership in forming and developing Ukraine's educational ecosystem]. *Vcheni zapysky KNEU – Scientific Notes of KNEU*, (38), 120–134. https://doi.org/10.33111/vz_kneu.38.25.01.10.068.074 (in Ukrainian)
20. Tarasenko, S. I., & Demchenko, M. Ye. (2017). Partnerstvo universytetiv ta biznesu: formy ta perspektyvy rozvytku v umovakh pidvyshchennia innovatsiinosti ekonomiky [University–business partnership: forms and prospects in increasing innovation orientation of the economy]. *Ekonomika i suspilstvo – Economy and Society*, (13), 302–308. https://economyandsociety.in.ua/journals/13_ukr/49.pdf (in Ukrainian)
21. Skyba, Yu., Zhabenko, O., Kovtunets, V., Otych, O., Chervona, L., & Yaroshenko, O. (2024). Teoretychni osnovy i mekhanizmy vzaiemodii vyshchoi osvity ta rynku pratsi v umovakh voiennoho stanu ta pisliavoiennoho vidnovlennia Ukrainy [Theoretical bases and mechanisms of interaction between higher education and the labor market under martial law and postwar recovery]. Kyiv: Institute of Higher Education of NAES of Ukraine. <https://doi.org/10.31874/978-617-7486-43-4-2024> (in Ukrainian)
22. Fokina-Mezentseva, K. V., & Baida, I. (2019). Zarubizhnyi dosvid spivrobotnytstva ZVO z derzhavoiu ta biznesom [Foreign experience of HEIs' cooperation with the state and business]. In *Proceedings of the International Scientific-Practical Conference “Problems of Integration of Education, Science and Business in Globalization Conditions”* (pp. 23–24). Kyiv: KNUVD. <https://er.knutd.edu.ua/handle/123456789/14429> (in Ukrainian)
23. Yashchyshyna, I. V. (2024). Naukovo-doslidna spivpratsia universytetiv ta biznesu: optymizatsiia shliakhiv poshuku partneriv [Research cooperation between universities and business: optimizing partner search pathways]. *Ekonomichniy prostir – Economic Space*, (195), 148–153. <https://doi.org/10.30838/EP.195.148-153> (in Ukrainian)