

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

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N. V. Tkalenko, Doctor of Economic Sciences,
Professor,
N. I. Kholiavko, Candidate of Economic Sciences,
Associate Professor,
K. V. Hnedina, Candidate of Economic Sciences,
Associate Professor

Н. В. Ткаленко, д. е. н.,
професор,
Н. І. Холявко, к. е. н.,
доцент,
К. В. Гнедіна, к. е. н.,
доцент

**VECTORS OF HIGHER EDUCATION SECTOR
TRANSFORMATION IN CONDITIONS OF THE
INFORMATION ECONOMY FORMATION****ВЕКТОРИ ТРАНСФОРМАЦІЇ СЕКТОРУ ВИЩОЇ
ОСВІТИ В УМОВАХ ФОРМУВАННЯ
ІНФОРМАЦІЙНОЇ ЕКОНОМІКИ**

Urgency of the research. Dynamic transformations of economic systems in the 21st century are intensified by the processes of active development of information and communication technologies. Under such circumstances, the level of global competitiveness of the national economy is largely determined by the capacity of economic subjects of the country to generate and implement operationally innovative technologies in business processes.

Target setting. Transition to the information economy, based on generation, processing and use of knowledge-based information, involves maximum utilization of the existing potential and reserves of all economic subjects. A special role is played by the sector of the higher education presented by the higher educational institutions.

Actual scientific researches and issues analysis. The problems of information society development and information economy formation are the research subject of domestic and foreign scientists: O. Alimov, V. Andrushchenko, D. Bell, B. Danylyshyn, M. Castells, M. Zgurovsky, J. Masuda, I. Malik, O. Toffler, A. Chukhno, O. Shevchuk, S. Shkarlet, etc.

Uninvestigated parts of general matters defining. The research question of determining the role and priority directions of increasing the impact of the higher education sector on the processes of information economy formation need in-depth study.

The research objective. The aim of the article is to identify the main vectors of the dual-power interaction of the higher education sector and the national economy in the current conditions of transition to the development on the basis of information, innovation and knowledge of the complexity.

The statement of basic materials. The article identifies the role of the higher education sector in the processes of information economy formation. The authors identify the directions of mutual influence of the subjects of higher education sectors and business enterprise sector at the information age. The prospects of transformation of Ukrainian higher educational institutions activities in the context of informational economy formation are substantiated.

Conclusions. The study leads to the conclusions about the existence of correlations between the rates of information economy development and the degree of interaction between business enterprise sector and higher education sector in the spheres of educational and research activities.

Keywords: information economy; higher education sector; information and communication technologies; higher educational institution.

Актуальність теми дослідження. Динамічні трансформації економічних систем у ХХІ столітті посилюються процесами активного розвитку ІКТ. За таких обставин рівень глобальної конкурентоспроможності національної економіки значною мірою визначається спроможністю економічних суб'єктів країни до генерації й імплементації інноваційних технологій у бізнес-процеси.

Постановка проблеми. Перехід до економіки інформаційного типу, що ґрунтується на генерації, обробці та використанні базованої на знаннях інформації, передбачає максимальне задіяння наявного потенціалу та резервів усіх економічних суб'єктів. Особливу роль при цьому відіграє сектор вищої освіти, представлений вищими навчальними закладами.

Аналіз останніх досліджень і публікацій. Проблеми розвитку інформаційного суспільства і становлення інформаційної економіки є об'єктом дослідження вітчизняних та іноземних вчених, зокрема: О. Алімова, В. Андрущенко, Д. Белла, Б. Данилишина, М. Кастельса, М. Зеуровського, Й. Масуда, І. Малик, О. Тоффлера, А. Чухно, О. Шевчука, С. Шкарлета та ін.

Виділення недосліджених частин загальної проблеми. Питання визначення ролі та пріоритетних напрямів активізації впливу сектору вищої освіти на процеси формування інформаційної економіки потребують поглибленого наукового опрацювання і дослідження.

Постановка завдання. Метою статті є ідентифікація основних векторів дуонаправленого взаємовпливу сектору вищої освіти та національної економіки в сучасних умовах переходу на розвиток на засадах інформаційності, інноваційності та знаннємісткості.

Виклад основного матеріалу. У статті ідентифіковано місце сектору вищої освіти у процесах формування інформаційної економіки. Авторами досліджено напрями взаємовпливу суб'єктів секторів вищої освіти та бізнесу в інформаційну епоху. Обґрунтовано перспективи трансформації діяльності ВНЗ України в контексті становлення економіки інформаційного типу.

Висновки. Проведене дослідження дозволяє дійти висновків про наявність кореляцій між темпами розвитку інформаційної економіки та ступенем взаємодії секторів бізнесу й вищої освіти у сферах підготовки кадрів та науково-дослідної діяльності.

Ключові слова: інформаційна економіка; сектор вищої освіти; інформаційно-комунікаційні технології; ВНЗ.

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Urgency of the research. Dynamic transformations of economic systems in the 21st century are intensified by the processes of active development of information and communication technologies. Nowadays, knowledge, information and technologies are full-fledged elements of the productive forces, penetrating management and functioning of business enterprise, government, higher education, and private non-profit sectors of the economy. Under such circumstances, the level of global competitiveness of the national economy is largely determined by the capacity of economic subjects of the country to generate and implement operationally innovative technologies in business processes.

Target setting. Transition to the information economy, based on generation, processing and use of knowledge-based information, involves maximum utilization of the existing potential and reserves of all economic subjects. Herewith, a special role is played by the sector of the higher education presented by the higher educational institutions as organizations in which a powerful intellectual potential is concentrated that is able to provide scientific, technical and innovative development of the national economy.

Actual scientific researches and issues analysis. The most close semantic-logical connections, the notion "information economy" has with the terms "knowledge economy", "knowledge based economy", "post-industrial economy", "information society", "network economy", "digital economy", "electronic economy", "neoindustrial society", "new economy", "Internet economy", etc. Problems of the information society development and the information economy formation are the objects of research of domestic and foreign scientists, in particular: O. Alimov, V. Andrushchenko, D. Bell, B. Danilishyn, M. Castells, M. Zgurovsky, Y. Masuda, I. Malyk, O. Toffler, A. Chukhno, O. Shevchuk, S. Shkarlet and others.

Uninvestigated parts of general matters defining. Despite the existence of a solid scientific record of the domestic and foreign researchers, the issue of determining the role and priority directions of enhancing the impact of the higher education sector on the processes of formation of the information economy requires in-depth scientific processing and research.

The research objective. The purpose of the article is to identify the main vectors of the dual-power interaction of the higher education sector and the national economy in the current conditions of transition to the development on the basis of information, innovation and knowledge of the complexity.

The statement of basic materials. Information and knowledge in the conditions of transformational social and economic changes become the valuable goods, an element of productive forces, an additional factor of production, the main resource, a powerful competitive advantage and currency [5; 7; 9]. Subjects of the higher education sector – the higher educational institutions – as generators, replicators and implementers of innovative knowledge (which are the basis of the modern information technologies), become central actors of the economic system. Intensification of the processes of the information economy formation in Ukraine needs to increase the universities' level of dynamism, flexibility and adaptability of the. In other words, the vectors of dual-directed interaction between the higher education sector and the information economy need to be taken into account.

At the current stage of the development of the national university education and academic science, there are tendencies that have a limiting effect of the information economy formation: their separation from the real sector of the economy; relatively slow transfer pace of knowledge and technology; slow pace of commercialization of the research and innovation activities in the business enterprise sector; excessive bureaucratization of the system, which slows down the processes of making managerial decisions; outdated material and technical base of a number of educational institutions of Ukraine; barriers at the current stage of expanding of the universities financial autonomy; insufficient diversification of funding sources, etc.

The results of previous investigation of the higher education system in Ukraine indicates, that despite the high level of education enrolment the level of the quality of education is insufficient, that is caused by the influence of the range of factors on macro- and micro levels. Insufficient quality level of

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the education slows the economic growth, causes the rising unemployment and reducing of the quality life level [1]. According to the actual economic challenges it is urgent to modernize the educational, research, innovation and financial-economic activities of the higher educational institutions as drivers of the information economy development. First of all, it is about ensuring the compatibility of the higher education sector with the components of the so-called framework 8 "C", for which we can define the following priority directions [2] – Tab. 1

Table 1

The 8 "C" Framework In Analyzing The Higher Education Sector's Role In Information Economy Formation

№	Component	Grounding
1 C	Connectivity	access expansion to modern information and communication technologies by operative updating of computer equipment, software; wide access of students, teachers and researchers to the Internet (2016: Ukraine is ranked the 76th position in the world by the level of individual usage of information technology; the 63th position – business usage; the 114th position - government usage [4]); implementation of the specialized training courses and programs on modern information and communication technologies into the educational process
2 C	Content	wide access of students, researchers and University teachers to high-quality professional content (for example, to articles in modern leading world scientific-metric bases: Web of Science, Scopus, Index Copernicus, Astrophysics, PubMed, Mathematics, Springer, GeoRef, etc.)
3 C	Community	development of high-powered online platforms by the leading technological universities in order to transform the country into one of the world's hubs of global communications (Ukraine ranked the mediocre position in 2016 on parameters: "Availability of the latest technologies" (the 96th position out of 139 countries), "Internet bandwidth" (the 63rd), "Secure Internet servers" (the 68th position) [4])
4 C	Commerce	educational institutions should orient their activities at: a) preparing a new generation of entrepreneurs (able to create and manage the virtual enterprises) and staff (competitive in the conditions of the information economy) – potential of the national system is due to the fact that, according to the criterion "The Higher Education and Training", Ukraine is the 33rd largest country in the world in 2016 [3]; b) development of universities' entrepreneurial functions
5 C	Capacity	creation of the effective motivators in the higher education sector for the development of scientific creativity, and innovation activeness to encourage the creation, transfer, commercialization and export of information; the higher education sector is the core of development of human resources as a driving force for information economy formation. In 2016, the capacity of Ukraine to retain talent was estimated by the World Economic Forum at 2.5 points, making it the 127th in the world; and the capacity to attract talent - the 93rd position [3]
6 C	Culture	the key role of universities is mainly to form the innovative consciousness in the society (susceptibility of innovations, readiness for implementation of the information and communication technologies and their active usage in the life and professional activity. Ukraine is ranked the 63rd in the world by the number of households with personal computers; the 72th - by the level of their Internet access; the 78th - by the degree of the use of virtual social networks [4]);
7 C	Cooperation	in the Ukrainian realities one of the functions of the higher education institutions is initiating effective communications between the representatives of the business enterprise, higher education, government, private non-profit sectors; partnerships development is possible on the basis of creating a favorable regulatory environment at the national level (according to the World Economic Forum, in 2016 Ukraine showed rather weak positions by the parameters "Political and regulatory environment" (the 113th place) and the "Effectiveness of law-making bodies" (the 120th place) [4])
8 C	Capital	this component is problematic for the domestic higher education institutions that have difficulties by attracting investment and need to intensify fundraising activities to diversify funding sources, filling university budgets, which is crucial in the context of the current trends by expansion of the financial autonomy of the higher education institutions [2]. In general, in Ukraine only 5.2% of the state funding is put on the financing research in the direction of "Information and Communication Technologies" - UAH 151.97 million in 2016 [8]

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Consequently, formation of the information economy puts forward a number of the requirements for the higher education sector, which requires much more profound transformations than simply implementing the information and communication technologies in the educational and research processes, and expanding the scope of distance education. The priorities of the functions transformation of the higher educational institutions in terms of their activities in the context of the formation of the information economy are described in Tab. 2.

Table 2

Priority directions of the functions transformation of the higher educational institutions in the context of the information economy formation

Function	Transformation direction	Grounding
Educational	<ul style="list-style-type: none"> – staff training for the needs of information economy (key competencies: ability to generate innovations; high adaptability to dynamic of the socio-economic changes; operative implementation of the modern information and communication technologies; ability to aggregate, analyze and effectively use information resources); – preparation of a new generation of the entrepreneurs (able to conduct business in the field of information and telecommunication technologies, information resources) 	<p>The information economy formation causes transformation of the approaches to the organization of the business activities, leads to the new business models emerge, which means changing of the requirements to the competent structure of both personnel and entrepreneurs. There are three groups of competencies, applicable in the conditions of the information economy: cognitive (literacy, logical, mathematical, analytical thinking; creativity; problem solving skills), social (emotional intelligence; readiness to get new experience; stress resistance; communication and leadership skills; teamwork skills), technical (computer skills; ability to search and process information in the Internet; knowledge of professional software and information technology; ability to adapt quickly to technological innovation) [6, p. 33].</p> <p>According to the World Economic Forum, in Ukraine 33.7% of the workforce is employed in knowledge-intensive jobs - it is 38th among 139 countries [4].</p>
Scientific-research and innovative	<ul style="list-style-type: none"> – harmonization of research projects of the higher educational institutions with the actual requests of the business sector; – transfer and commercialization of the research activities results in the real sector of the national economy; – inventions patenting; – initiation and realization of the joint innovative scientific and educational projects 	<p>The information economy formation causes the close cooperation of the business enterprise sector with organizations, which conduct researches in the field of development of information and communication technologies. Ensuring stable competitive positions of the economic agents makes it necessary to take into account the modern trends: according to the World Bank, in 2015, 1.1 billion of the planet population had high-speed access to the Internet with about 3.2 billion people who regularly use the Internet [6, p. 8]. In 2016, 49.3% of the population of Ukraine used the Internet - it is the 80th place among 138 countries of the world [3]. Every year, the number of people who have access to the information and communication technologies is expanding, which requires from the business enterprise sector to be quickly involved and able to present its products through the Internet, and also to introduce innovations actively, and increase the volume of the science-intensive products producing. Herewith, it feasible to implement cooperation of the enterprises with the universities including within functioning of the local innovation centers (technology parks, business incubators, technopolises at the higher educational institutions).</p>

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Continuation of Table 2

Financial-economic	–diversification of funding sources; –attraction of private investments; –grant funding from foreign and national funds; –development of fundraising activity; –foundation of endowment funds	Modernization of the educational process, improvement of the research activities, activation of the innovation development is impossible without timely updating of the material and technical base and introduction of the modern information and communication technologies, which requires significant investments. Expansion of the financial autonomy of the Ukrainian universities is particularly relevant to ensuring their financial sustainability; in the conditions of high competition on the educational services market, innovative leadership, activity in the implementation of modern information technology is an integral factor of the university competitiveness.
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Conclusions. The research allows us to conclude that there are correlations between the pace of the information economy development and the degree of interaction between the business enterprise sector and the higher education sector in the field of staff training (in terms of competence, professional, qualifications structures; lifelong learning; readiness to innovations; skills of modern entrepreneurs capable doing business in a dynamically changing environment) and research activity (conducting of joint research to generate new knowledge, technologies, information; implementation of innovative projects; transfer and commercialization of innovations). Mutual benefit of such partnership is substantiated: on the one hand, it means the ability of the higher educational institutions to become more actively integrated and to be able to respond adequately to the actual requests of the national economy real sector, as well as to ensure diversification of the funding sources by increasing the inflow of private investment. On the other hand, the cooperation with the higher education sector causes the increasing of the innovative activity of the business enterprise sector because of widening of the economic entities access of to the latest scientific developments, inventions, information, professional consultations, professional expert services, etc. Significant separation and distance of the university education and academic science from the real economy leads to the need for further scientific search of effective tools to minimize the adverse effects of exogenous and endogenous factors and barriers of the operational transition of the national economy on the development under the principles of information, innovation, and knowledge of the complexity.

References

1. Hnedina, K. (2016) The reformation of higher education system in Ukraine as a factor of innovative development of national economy. *Scientific bulletin of Polissia*, 4(8), 1, 106-117 [in English].
2. Madanmohan, R. (n.d.). The nature of the information society: a developing world perspective. www.itu.int/visions. Retrieved from <https://www.itu.int/osg/spu/visions/papers/developingpaper.pdf> [in English].
3. The Global Competitiveness Report 2016-2017. (n.d.). www.weforum.org. Retrieved from <https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1> [in English].
4. The Global Information Technology Report 2016. (July 6, 2016). www.weforum.org. Retrieved from <https://www.weforum.org/reports/the-global-information-technology-report-2016> [in English].
5. *Aktualni problemy formuvannia ta rozvytku informatsiinoi ekonomiky v Ukraini [Urgent Problems of Information Economy Formation and Development]*. (2017). Chernihiv [in Ukrainian].
6. Doklad o mirovom razvitii 2016. Tsifrovyye

Література

1. Hnedina, K. V. The reformation of higher education system in Ukraine as a factor of innovative development of national economy / K. V. Hnedina // Науковий вісник Полісся. – 2016. – № 4 (8), ч. 1. – С. 106-117.
2. Madanmohan, Rao. The nature of the information society: a developing world perspective [Electronic resource] / Madanmohan Rao. - Access mode: <http://www.itu.int/visions>
3. The Global Competitiveness Report 2016-2017. [Electronic resource]. - Access mode: <https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1>.
4. The Global Information Technology Report 2016. [Electronic resource]. - Access mode: <https://www.weforum.org/reports/the-global-information-technology-report-2016>.
5. Актуальні проблеми формування та розвитку інформаційної економіки в Україні : колективна монографія. – Чернівці : ЧНТУ, 2017. – 292 с.
6. Доклад о мировом развитии 2016. Цифровые дивиденды: обзор Всемирного банка [Электронный ресурс]. - Режим доступа:

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dividendy: obzor Vsemirnogo banka. [World Development Report 2016. Digital dividends: World Bank review]. (January 1, 2016). *worldbank.org*. Retrieved from <http://documents.worldbank.org/curated/en/224721467988878739> [in Russian].

7. Malik, I. (2013) Tendentsii rozvytku informatsiinoi ekonomiky v Ukraini [Tendencies of development of information economy in Ukraine]. *Visnyk Shkhidnoevropeiskoho universytetu ekonomiky i menedzhmentu – Bulletin of the East European University of Economics and Management, 1(14), 25-34* [in Ukrainian].

8. Realizatsiia priorytetnykh napriamiv rozvytku nauky i tekhniky ta otrymani rezultaty u 2016. [Realization of priority directions of science and technology development and results in 2016]. (2017). *mon.gov.ua*. Retrieved from [http://mon.gov.ua/content Diialnisty/Nauka/ad-vru-2017-prav-1.pdf](http://mon.gov.ua/content/Diialnisty/Nauka/ad-vru-2017-prav-1.pdf) [in Ukrainian].

9. Shkarlet, S., Kholiavko, N. (2015). Transformatsiia natsionalnoi ekonomichnoi systemy iz kohnityvno-informatsiinyu yakostiamy: endohennyi ta ekzohennyi resurs [Transformation of the National Economic System with Cognitive-Informational Qualities: Endogenous and Exogenous Resource]. *Biznes-inform – Business-Inform, 1, 59-66* [in Ukrainian].

<http://documents.worldbank.org/curated/en/224721467988878739>.

7. Малик, І. П. Тенденції розвитку інформаційної економіки в Україні / І. П. Малик // Вісник Східноєвропейського університету економіки і менеджменту. – 2013. – Вип. 1 (14). – С. 25-34.

8. Реалізація пріоритетних напрямів розвитку науки і техніки та отримані результати у 2016 р. [Електронний ресурс]. - Режим доступу: <http://mon.gov.ua/activity/nauka/informacijno-analitichni-materiali.html>.

9. Шкарлет, С. М. Трансформація національної економічної системи із когнітивно-інформаційними якостями: ендогенний та екзогенний ресурс / С. М. Шкарлет, Н. І. Холявко // Бізнес-інформ. – 2015. – № 1. – С. 59-66.

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