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DETERMINANTS AND FACTORS OF THE INFLUENCE OF INTELLECTUAL POTENTIAL ON THE COUNTRY'S DIGITAL COMPETITIVENESS AND BUSINESS MOBILITY

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Краус К. Детермінанти та фактори впливу інтелектуального потенціалу на цифрову конкурентоспроможність країни і мобільність бізнесу. *Вісник економіки*. 2025. Вип. 1. С. 41–53. DOI: 10.35774/visnyk2025.01.041.

Abstract.

Introduction. Digital changes inherent in modern economic relations require conscious perception by all economic participants and rapid adaptation to them. The development of intellectual human capital, digital entrepreneurship and innovativeness of the economy, based on expanding existing knowledge, revealing talents, and strengthening scientific research, are becoming an indisputable condition.

Purpose. Assessment of the influence of factors on the digital competitiveness of countries, substantiation of the importance of human potential for the effectiveness of digital entrepreneurship, as well as determining priorities for the development of education with the use of digital technologies.

Methods. When studying the existing developments in understanding digital competitiveness, factors and subfactors that influence it, methods of analysis and synthesis were used. Graphical and statistical methods allowed us to visually present the ratings of digital competitiveness of countries in the world in terms of subfactors in 2019, 2021 and 2023. Comparison and generalization methods contributed to comparing the levels of digital competitiveness of individual countries in the world in 2019, 2021, and 2023, as well as identifying the role of human resources in the development of an innovative economy, digital entrepreneurship, strengthening business mobility, and digital competitiveness.

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Results. *It was found that the strengthening of the country's digital competitiveness and the development of digital entrepreneurship in it are influenced by three levels of technological transformations – organizational, institutional, and structural. The ranking positions of countries' digital competitiveness according to "Knowledge" criterion of the IMD World Digital Competitiveness Ranking in 2019, 2021, and 2023 were analyzed and it was found that the leadership here is maintained by the USA, Singapore, Switzerland, and Sweden. The subfactors "Talent", "Education and Training", "Scientific Concentration" of the "Knowledge" criterion of the ranking of digital competitiveness of countries are characterized, which showed that the balance of digital changes in the economy directly depends on the intellectual potential of human capital, its ability to generate new knowledge and ideas, to constantly learn and self-develop.*

Perspectives. *Prospects for further research consist in developing practical measures to restore the country's potential for economic growth, high-tech and innovative development, as well as developing ways to strengthen its intellectual human capital.*

Keywords: *digital competitiveness; digital entrepreneurship; economic growth; intellectual potential; human capital; knowledge; education; scientific research; innovative economy.*

Formulas: 0, **fig.:** 5, **tabl.:** 0, **bibl.:** 19.

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Formation of the problem. The current digital transformation of economic relations raises the relationship between government bodies, business, and society to a new level, creates conditions for a more rational development of the country's production potential, opens up opportunities for new forms and methods of conducting business, changes consumer behavior in the market, and forms a new philosophy of economic perception and cognition. Along with this, digital transformations require reviewing traditional methods of state and business management, collecting and processing relevant data for the implementation of important socio-economic programs and decision-making, increasing the media and digital literacy of citizens, ensuring a high level of information and financial security, and expanding accessibility and inclusiveness to public goods and public services.

To implement most of the above-mentioned tasks and initiatives, there is a need to develop the intellectual potential of labor resources, as well as stimulate them to creativity, inventiveness and inventiveness. This involves both improving existing human skills and acquiring new knowledge and developing new abilities. To achieve the goals of sustainable development, an optimal combination of all economic resources is required, which are extremely limited today, which requires their systematic and rational distribution, taking into account the need to meet the needs of future generations in goods/services.

Economic growth and prosperity in the long term in the context of instability and turbulence in the global dimension is quite imaginary and uncertain, and therefore there is an urgent need for a clear understanding of the tools and means that will help achieve stable economic development. In such circumstances, the implementation of digital initiatives and innovative solutions must necessarily be accompanied by the development of human potential, in particular its intellectual component.

Literature review. The human ability to be flexible and adaptable in a rapidly changing external environment, as well as the ability to acquire new knowledge and professions, has always interested researchers and scientists. This has become especially relevant in the course of the dynamic spread of information and communication and digital technologies, which have exacerbated the issues of determining the place of man in the modern world, the struggle between human and artificial intelligence, and laid the foundations for the formation of a knowledge economy.

Slovak researchers D. Kiselakova, B. Sofrankova, M. Gombar and M. Matijova note that “digital transformation is a complex change in society aimed at using ICT to increase productivity, economic growth and competitiveness” [1, p. 296], and they assign a priority role in the digital competitiveness of countries to the acquisition of new knowledge by citizens and the promotion of scientific developments. In addition, A. Bris, Ch. Cabolis, J. Caballero in their report “The IMD World Digital Competitiveness Ranking. How does your country rank?” argue that the “Knowledge” factor in digital competitiveness “is the necessary infrastructure that underlies the process of digital transformation through the discovery, understanding and learning of new technologies” [2].

The issue of digital changes in business and production is also raised in her work by researcher Yu. Chalyuk, who notes that “the combination of digital and material aspects of production, the use of innovative technologies, and investment in education are of great importance for the growth of economic competitiveness both at the level of enterprises and states as a whole” [3, p. 30]. In this context, we find interesting the research work of E. Ernawati, M. Natsir and M. Asri, where they identified three aspects of digital competitiveness (knowledge, digital policy, IT integration). The researchers found that “digital policy variables worsen macroeconomic indicators, and... digital knowledge and IT integration variables do not significantly affect macroeconomic indicators” [4].

Romanian scientists G. Hurduzeu, I. Lupu, R. Lupu and R. Filip in their research sought to reveal the digital aspects of competitiveness using the example of EU countries for 2017–2022, taking into account the Digital Economy and Society Index (DESI) and the IMD World Competitiveness Index in the context of two groups of European countries, since the impact of different dimensions of digital transformation on competitiveness in these regions varies significantly [5]. At the same time, scientists V. Grosu, I. Andrioaia and I.-M. Tiganas are convinced that “the concept of “sustainable competitiveness” should encourage the EU to develop an economic policy that meets the interests of Eastern European member states, and also allows them to adapt their national policies to the requirements of the world market. Otherwise, most of these countries... risk being destroyed by the technological policies of China and the USA. Therefore, it is important that EU policies and strategies are focused on the formation of centers of technological development” [6, p. 66].

The competitive strength of countries is currently determined by the level of their innovation and digitalization, according to Spaniards L. Marti and R. Puertas. In their opinion, technological progress is a driver of economic growth. Researchers study the social, economic, and environmental vectors of development of countries that stimulate the emergence of technologies and innovations and conclude that today “the digital and innovation gap can be seen... between north-central and south-eastern Europe... and therefore governments of countries should promote wealth, employment, research and

investment in infrastructure in order to improve innovative and technological development in their countries" [7, p. 1].

In view of this, the scientist D. Lixandriou studies the issue of digital competitiveness of countries in the world in the 21st century, in particular, he assesses Romania's competitive position in the international arena based on the Digital Economy and Society Index (EU28 DESI), the International Digital Economy and Society Index (I-DESI), the extension of the UE28 DESI index, the E-Government Development Index (EGDI), the Human Capital Index (HCI), the IMD World Competitiveness Yearbook [8, pp. 107–108].

As we can see, among the important aspects of the digital competitiveness of countries, human capital is singled out as one that requires significant attention. Scientists from the Czech Republic and Austria [9], studying the digital capabilities of these countries, take into account the WDCR, GCI and DESI indicators, which showed that "in addition to higher GDP per capita and higher education spending per capita, Austria dominates in better teaching and education... The results obtained are important... for the future prospects of creating a cross-border communication network with the participation of educational institutions and enterprises from these countries" [9, pp. 12–13]. In addition, European researchers [10] consider digital competitiveness in the context of the digital turbulence of the external environment. They note that digital instability and the popularity of digital technologies have a beneficial effect on the ability to change and adapt [10, p. 78], in particular, this applies to a person and the vector of development of his potential.

In addition, researchers A. Botti, R. Parente, R. Vesci [11], P. Magliocca [12], within the framework of the international project "Teaching digital entrepreneurship", substantiated how the development of modern e-business and digital entrepreneurship affects the economic power of countries and their digital competitiveness in the world.

Therefore, we consider it appropriate to investigate the relationship between a country's digital competitiveness and the level of knowledge in it, citizens' ability to be creative and imaginative, to learn and self-develop, to be inventive and scientific. The country's economic growth, and with it the improvement of the nation's well-being, is possible under the conditions of increasing the innovative and intellectual potential, because the question now is not to produce more, but to produce rationally and qualitatively on the basis of accumulated knowledge, creating more usefulness for humans. Therefore, the statement "knowledge is power; learning is peace, and ignorance is darkness" acquires special significance today, because the increase and dissemination of knowledge and new skills are of fundamental importance for achieving long-term economic development.

Purpose. The purpose of the article is to assess the dependence of the digital competitiveness of countries on the level of knowledge in it, as well as such aspects as talent, training and education, scientific concentration; to substantiate the impact of existing human potential on the activities of digital entrepreneurship and business mobility; to outline the priorities for the development of education using digital technologies.

Results. The world as a whole, and society in particular, are now in the midst of a digital revolution that is rapidly gaining momentum. This opens up new horizons and enhances potential, but digital change is also a source of risks and challenges that require effective response tools. However, if measures are consistently and reasonably implemented to

prepare both the economy and society for digital transformation, then future economic prosperity and the well-being of nations in the context of digitalization become quite real.

The 2023 report “The IMD World Digital Competitiveness Ranking. How does your country rank?” states that “technological transformation occurs gradually, requiring shifts at the organizational, institutional and structural levels... and therefore the framework of digital competitiveness should encompass organizational, institutional and structural elements” [2] (Fig. 1).

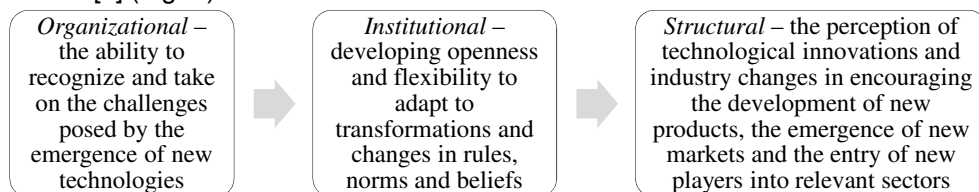


Fig. 1. Levels of technological transformations to strengthen digital competitiveness and develop digital entrepreneurship.

Source: compiled based on the source [2].

The importance of digital competitiveness in the current transformations in the world cannot be overestimated, as the business environment is also undergoing significant digital changes, which determines both the financial condition of business entities and their presence in the market. “This includes optimizing customer interactions, optimizing internal processes and the ability to flexibly respond to disruptive market forces, which affects the ability of a business to remain relevant and competitive” [13].

In order to outline promising directions for strengthening the economic strength and competitiveness of European countries in the digital world in 2024, J. Marcus and M. Rossi presented the report “Strengthening EU digital competitiveness: stoking the engine”, which identified the weaknesses of the digital transformation of European countries, in particular, the underdeveloped capital market, limited access to modern opportunities for acquiring digital skills and knowledge, burdensome rules for recognizing the insolvency of a business entity, unjustified regulatory burden and burdensome taxation system, lack of due attention to the development of the innovation ecosystem and inadequate technical infrastructure. These aspects, in the opinion of the researchers, require priority solutions in order to strengthen the competitive positions of European countries in the global digital space [14].

In the digital age, understanding a country’s competitiveness becomes important for assessing its economic strength, especially in aspects such as knowledge, technology, and future-readiness. To strengthen economies around the world in the face of global uncertainty through strategic digital investments and progress, it is necessary to improve digital infrastructure, develop digital talent through education, and promote the creation of a digital ecosystem to stimulate innovation across sectors of the economy [15, p. 1536].

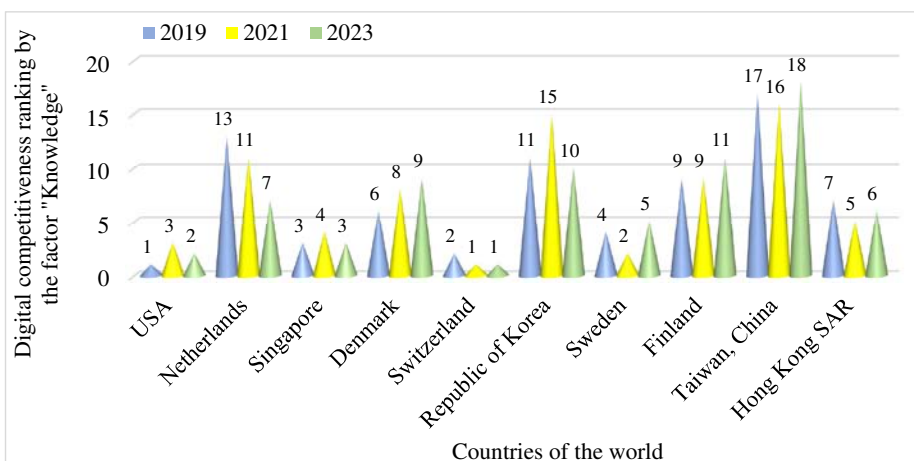


Fig. 2. Digital competitiveness rating of world's countries (TOP-10) by "Knowledge" factor according to the IMD WDCR in 2019, 2021, and 2023.
Source: built on the basis of the source [16, p. 50–51].

Analyzing the dynamics of the digital competitiveness of countries around the world by the criterion "Knowledge" during 2019, 2021 and 2023 (Fig. 2), we note that the leadership is retained by the USA, Singapore, Switzerland and Sweden, since it is these countries that pay special attention to the development of the intellectual capital of their labor resources, in every possible way stimulating their comprehensive development and testing of digital technologies in practice. Ultimately, this becomes the key to a competent approach to the launch and development of high-tech and digital business, strengthening its flexibility, mobility and maneuverability in a competitive environment.

No less important is the influence of individual subfactors on the generalized indicator of the digital capability of world's countries. Thus, under the "Knowledge" factor, IMD researchers distinguish the "Talent" subfactor, according to which the UAE, Switzerland, and the Netherlands became the leaders in 2023 (Fig. 3). A creative approach to solving complex problems, initiative and innovative thinking is currently especially valued, because the variability and instability inherent in most economic processes and relationships today require quick decisions, sometimes even risk. And considering that creativity, entrepreneurship and innovation are primarily manifested in young people, attention must be paid to motivating their development.

The data in Fig. 2 and 3 are evidence of the lag of European countries in terms of digital capabilities from the USA. "The high level of employment in ICT and related sectors, as well as the high intensity of trade in IT services, remained the strengths of the EU, which, undoubtedly, was the result of relatively rich human capital resources" [17, p. 364, 377].

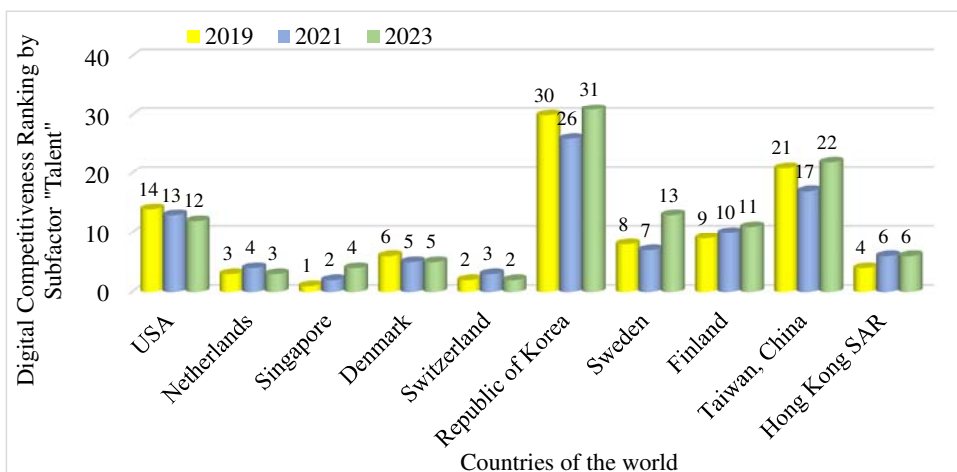


Fig. 3. Digital competitiveness rating of world's countries (TOP-10) by "Knowledge" factor and the subfactor "Talent" according to the IMD WDCR in 2019, 2021, and 2023.

Source: built on the basis of the source [16, p. 57–179].

In terms of the subfactor "Training and Education" of "Knowledge" factor of digital competitiveness (Fig. 4), the best result among the countries in 2023 was observed in Kazakhstan (1st position) and Canada (3rd position), while the leaders in knowledge – the USA and Switzerland – took only 20th and 7th positions in the ranking, respectively.

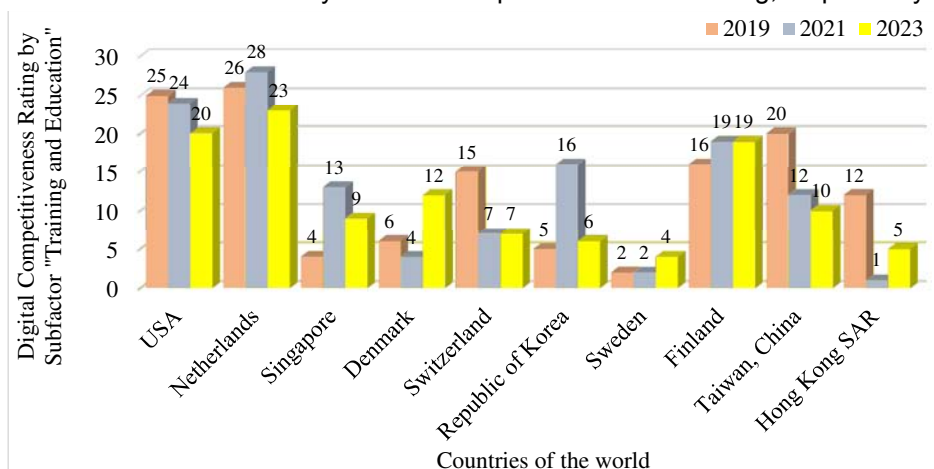


Fig. 4. Digital competitiveness rating of world's countries (TOP-10) by "Knowledge" factor and the subfactor "Training and Education" according to the IMD WDCR in 2019, 2021, and 2023.

Source: built on the basis of the source [16, p. 57–179].

By the way, although Ukraine lags behind developed countries in terms of human capital development, it regularly holds educational and awareness-raising events to increase the digital literacy of its citizens. Thus, in particular, in the Kirovohrad region in 2024, the

Central Ukrainian Digital Event 2024 digital forum “Strategic session of digitalization of the educational sector of the Kirovohrad region” was held, which aimed to outline the trends in digitalization of the educational sector, identify existing experience in implementing digital tools, and outline potential opportunities in the future. It was noted that “digital education is one of the priority areas and goals of the Ministry of Digital Transformation of Ukraine. Within the Regional Digitalization Index, digital education is one of the main components, which emphasizes the importance of increasing the level of digital skills among the population. Providing digital education will contribute to increasing the country's competitiveness on the global stage” [18].

No less important than innovation, creativity, and invention, which are the basis for creating advanced technologies and implementing them in business processes, is the ability to conduct scientific research and the productivity of scientific personnel. That is why the influence of “Scientific Concentration” is assessed on the country's rating in terms of digital competitiveness. According to this subfactor of “Knowledge” factor, the leadership in 2023 is represented by the following countries: 1st place – USA, 2nd place – Republic of Korea, 3rd place – Israel (Fig. 5).

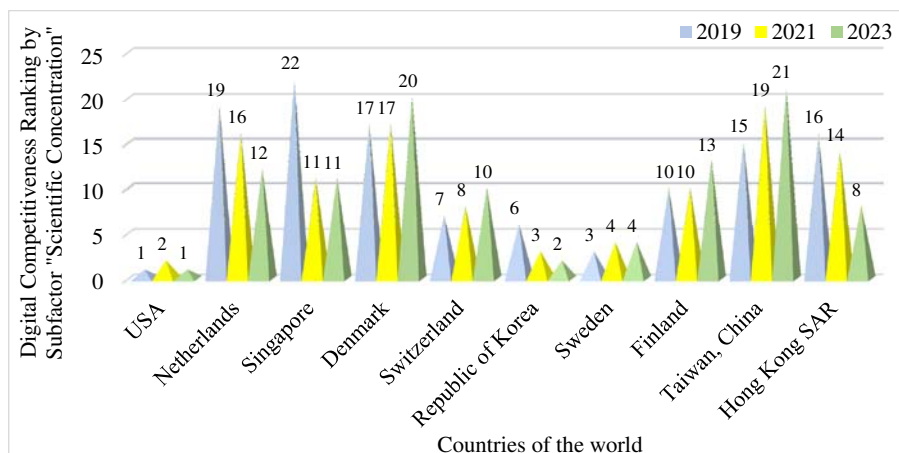


Fig. 5. Digital competitiveness rating of individual countries of the world (TOP-10) by the factor “Knowledge” and the subfactor

“Scientific concentration” according to the IMD WDCR in 2019, 2021, and 2023.

Source: built on the basis of the source [16, p. 57–179].

A slight deterioration in the effectiveness of scientific activity in 2023 compared to 2021 and 2019 is observed in countries such as Denmark, Switzerland, Finland and Taiwan (China). In contrast, positive dynamics are observed in the Netherlands, the Republic of Korea, and Hong Kong (SAR), which indicates the desire and efforts of these countries to remain technologically advanced, innovative and environmentally oriented, with a conscious and progressive population.

In order to increase business mobility, deepen its digitalization, and ensure the growth of the country's digital competitiveness as a whole, it is appropriate to: introduce strategies to promote the spread of digital technologies; improve the education and digital skills

of the population; develop human capital and strengthen its digital literacy; encourage the development of e-commerce in the context of forming a safe online environment, strengthening citizens' skills to participate in e-commerce, motivating organizations to join this format of doing business [19].

The world in the 21st century is changing so dynamically that both the economies of countries and society are forced to reconsider traditional models of their development and adapt to the digital reality. Both individual countries of the world and entire supranational organizations (for example, the EU) are transforming their usual economic landscape and classical understanding of the economic order, contributing to expanding access to communications and the Internet, diversifying online products/services, stimulating investments in innovations and digital solutions, introducing new business models.

Conclusions and prospects for further research. It is difficult today to imagine a country that strives for economic development and a high level of competitiveness without paying due attention to its human potential, expanding the knowledge of its citizens. Digital transformations in economic relations and the shortage of flexible human capital are obstacles to the formation of an innovative economy focused on digital transformation. This can slow down the dynamics of economic development, the effectiveness of digital entrepreneurship, technological and knowledge-intensive production.

Of fundamental importance for the high-tech development of the economy is the growth of the country's intellectual potential, its ability to generate new knowledge, develop talents, and conduct high-quality scientific research. All this requires: increasing the adaptability, flexibility, and mobility of all participants in economic relations; increasing funding for education, training, and scientific research; forming and developing digital skills of members of society for the implementation of everyday life processes; deepening the science-intensiveness and technological sophistication of economic sectors; ensuring self-improvement and self-learning of the country's citizens in order to prepare them in advance for future digital changes and non-standard situations.

Investing time and money in human capital, knowledge, education, science is an investment in the future, something that is long-term, it is an investment in the knowledge economy. Ultimately, this will become a driver for the formation of digital entrepreneurship, the development of high-tech sectors of the economy, strengthening its innovativeness, and increasing the level of the country's digital competitiveness in the world.

Further scientific research should focus on developing practical measures for the high-tech and innovative development of the economy, in particular in terms of increasing the country's intellectual capital, its ability to generate new knowledge, develop talents, and conduct high-quality scientific research.

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ДЕТЕРМІНАНТИ ТА ФАКТОРИ ВПЛИВУ ІНТЕЛЕКТУАЛЬНОГО ПОТЕНЦІАЛУ НА ЦИФРОВУ КОНКУРЕНТОСПРОМОЖНІСТЬ КРАЇНИ І МОБІЛЬНІСТЬ БІЗНЕСУ

Аннотація.

Вступ. Цифрові зміни, що притаманні сучасним економічним відносинам, вимагають усвідомленого їх сприйняття всіма економічними учасниками та швидкої адаптації до них. Беззаперечною умовою є розвиток інтелектуального людського капіталу, цифрового підприємництва й інноваційності економіки, що ґрунтуються на розширенні наявних знань, розкритті талантів, посиленні наукових досліджень.

Мета статті – оцінювання впливу факторів на цифрову конкурентоспроможність країн, обґрунтування значимості людського потенціалу для ефективності цифрового підприємництва, а також визначення пріоритетів розвитку освіти з використанням цифрових технологій.

Методи. У процесі опрацювання наявних у науковій літературі матеріалів щодо розуміння рівнів цифрової конкурентоспроможності країни, факторів та субфакторів, що на неї впливають, використано методи аналізу й синтезу. Графічний і статистичний методи дали змогу візуально представити рейтинги цифрової конкурентоспроможності країн світу відповідно до субфакторів у 2019, 2021 і

2023 рр. Методи порівняння й узагальнення сприяли зіставленню рівнів цифрової конкурентної спроможності країн світу та підсумуванню наслідків впливу стану людського капіталу на розвиток інноваційної економіки, цифрового підприємництва, посилення мобільності бізнесу й цифрової конкурентоспроможності.

Результати. Виявлено, що на зростання рівня цифрової конкурентоспроможності країни та розвиток цифрового підприємництва в ній впливають три рівні технологічних трансформацій – організаційний, інституційний, структурний. Проаналізовано динаміку зміни рейтингу цифрової конкурентоспроможності окремих країн світу за критерієм «Знання» IMD World Digital Competitiveness Ranking у 2019, 2021 та 2023 рр. і встановлено, що лідерами все ще є США, Сінгапур, Швейцарія та Швеція. Здійснено оцінювання таких субфакторів, як: «Талант», «Освіта та навчання», «Наукова концентрація» відповідно до критерію «Знання» рейтингу цифрової конкурентоспроможності країн, яка засвідчила, що ефективність цифрової трансформації економіки, зокрема бізнесу, прямо залежить від інтелектуального потенціалу людського капіталу, здатності його генерувати нові знання та ідеї, постійно навчатися і саморозвиватися.

Перспективи. Перспективи подальших досліджень полягають у напрацюванні практичних заходів з відновлення потенціалу країни до економічного зростання, високотехнологічного та інноваційного розвитку, а також розроблення шляхів посилення її інтелектуального людського капіталу.

Ключові слова: цифрова конкурентоспроможність, цифрове підприємництво, економічне зростання, інтелектуальний потенціал, людський капітал, знання, освіта, наукові дослідження, інноваційна економіка.

Формули: 0, рис.: 5, табл.: 0, бібл.: 19.

JEL classification: J24, O32, O33, O40, P13.

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