

S. Breus,

Doctor of Economic Sciences, Professor, Professor of the Department of Management and Marketing, European University, Kyiv, Ukraine

ORCID ID: <https://orcid.org/0000-0003-0624-0219>

M. Denysenko,

Doctor of Economic Sciences, Professor, Habilitated Doctor of Economic Sciences, Professor of Economic Sciences, Professor of the Department of Management and Entrepreneurship, Volodymyr Vynnychenko Central Ukrainian State University, Kropyvnytskyi, Ukraine

ORCID ID: <https://orcid.org/0000-0001-8767-9762>

M. Hlukhov,

Postgraduate Student, European University, Kyiv, Ukraine

ORCID ID: <https://orcid.org/0009-0005-9330-3012>

O. Tsybalenko,

Postgraduate Student, European University, Kyiv, Ukraine

ORCID ID: <https://orcid.org/0009-0002-5415-0381>

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IT COMPANIES: INFORMATION TECHNOLOGIES AS A TOOL FOR ADAPTATION TO MODERN REALITIES OF ECONOMIC DEVELOPMENT OF UKRAINE

С. В. Бреус,

д. е. н., професор, професор кафедри менеджменту та маркетингу, Європейський університет, м. Київ, Україна

М. П. Денисенко,

д. е. н., професор, doktor habilitovanyi nauk ekonomichnykh, profesor nauk ekonomichnykh, професор кафедри менеджменту та підприємництва, Центральноукраїнський державний університет імені Володимира Винниченка, м. Кропивницький, Україна

М. О. Глухов,

аспірант, Європейський університет, м. Київ, Україна

О. Е. Цимбаленко,

аспірант, Європейський університет, м. Київ, Україна

ІТ-КОМПАНІЇ: ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ ЯК ІНСТРУМЕНТ АДАПТАЦІЇ ДО СУЧАСНИХ РЕАЛІЙ ЕКОНОМІЧНОГО РОЗВИТКУ УКРАЇНИ

The article examines the main aspects and role of information technologies as a tool for adapting companies to modern realities of economic development of Ukraine in the context of ensuring its growth and accelerating the transition of the state and regions to sustainable development. The losses of Ukraine as a result of the full-scale invasion of Russia into Ukraine and the interrelation of indicators through the prism of the development of the IT sphere are considered. Attention is focused on the main actions of representatives of the business community, which helped businesses survive from the beginning of the full-scale Russian invasion of Ukraine. An intermediate conclusion was made that companies with strong potential are able to survive in modern conditions, improve their financial and economic indicators in the case of effective use of information technologies and contribute to economic growth can become the so-called "drivers", the main of which before the full-scale invasion was internal consumption, which was significantly provided and supported by the

development of the IT sphere. It was determined that currently, in order to survive and ensure the future prosperity of the state, the need to develop and realize the potential of the market of information technologies and IT companies and the field as a whole, as having significant prospects for development in the period of post-war recovery as well as at the level of the state, is of great importance, as well as at the level of commercial products. It is noted that such measures can be effective in the context of the formation of relevant strategies, which can contribute to a certain extent by intensifying efforts at all levels to increase the efficiency of the use of information technology as a tool for adapting companies to the modern realities of economic development in Ukraine. The prospects of Ukraine's accession to the EU are considered as undeniable advantages that will contribute to the development of the IT sphere, the market of information technologies and information technologies in general, the loss of the IT sector from the war and negative macroeconomic trends. In the context of forecasting the development of IT companies, attention is focused on the fact that, provided there are no shocks in the state, the development of the Ukrainian field of IT information technologies is possible. It was concluded that to contribute to the growth of the economy of Ukraine in the post-war period and the period of post-war recovery and to accelerate the transition of the state and regions to sustainable development will be the activation of efforts at all levels of management to develop information technologies as a tool for adapting companies to the modern realities of economic development of Ukraine. development and adoption at all levels of management of balanced decisions, adequate to modern conditions, and development, as necessary, of the implementation of alternative options for strategies, in particular through the use of so-called "drivers" of economic growth in the case of using the potential of IT companies and the field of information technologies and the market in general.

У статті проведено дослідження основних аспектів та ролі інформаційних технологій як інструменту адаптації компаній до сучасних реалій економічного розвитку України у контексті у забезпеченні її зростання та пришвидшенню переходу держави та регіонів до сталого розвитку. Розглянуто втрати України у результаті повномасштабного вторгнення росії в Україну та взаємозв'язок показників через призму розвитку ІТ-сфери. Акцентовано увагу на основних діях представників бізнес-спільноти, які допомогли бізнесу вижити з початку повномасштабного російського вторгнення в Україну. Зроблено проміжний висновок, що компанії, які мають потужний потенціал здатні вижити в сучасних умовах, покращити свої фінансово-економічні показники у разі ефективного використання інформаційних технологій й сприяти економічному зростанню можуть стати так звані "драйвери", основним з яких до повномасштабного вторгнення було внутрішнє споживання, що значним чином забезпечувалось та підтримувалось розвитком ІТ-сфери. Визначено, що наразі задля виживання та забезпечення майбутнього процвітання держави важливого значення набуває потреба у розвитку та реалізації потенціалу ринку інформаційних технологій та ІТ-компаній й сфери в цілому, як такої, що має суттєві перспективи розвитку у період післявоєнного відновлення як на рівні на рівні держави, так і на рівні комерційних продуктів. Зазначено, що такі заходи можуть бути ефективними у контексті формування відповідних стратегій, сприяти чому певною мірою може активізація зусиль на усіх рівнях задля підвищення ефективності використання інформаційних технологій як інструменту адаптації компаній до сучасних реалій економічного розвитку України. Розглянуто перспективи вступу України до ЄС у якості незаперечних переваг, що сприятимуть розвитку ІТ-сфери, ринку інформаційних технологій та загалом інформаційним технологіям, втрати ІТ-сектору від війни та негативних макроекономічних тенденцій. Акцентовано увагу у контексті прогнозування розвитку ІТ-компаній на тому, що за умови відсутності потрясінь у державі можливий розвиток української сфери інформаційних технологій ІТ. Зроблено висновок, що сприяти забезпеченню зростання економіки України у повоєнний період та період післявоєнного відновлення й пришвидшенню переходу держави та регіонів до сталого розвитку буде активізація зусиль на усіх рівнях управління щодо розвитку інформаційних технологій як інструменту адаптації компаній до сучасних реалій економічного розвитку України можлива у разі у розроблення та прийняття на усіх рівнях управління виражених, адекватних сучасним умовам рішень та розроблення за потреби реалізації альтернативних варіантів стратегій, зокрема за рахунок використання так званих "драйверів" економічного зростання у разі використання потенціалу ІТ-компаній та сфери інформаційних технологій й ринку загалом.

Key words: IT companies, IT sphere, information technologies, drivers of economic growth, state, regions, sustainable development, strategies.

Ключові слова: ІТ-компанії, ІТ-сфера, інформаційні технології, драйвери економічного зростання, держава, регіони, сталий розвиток, стратегії.

GENERAL STATEMENT OF THE PROBLEM AND ITS LINK WITH MAJOR SCIENTIFIC OR PRACTICAL CHALLENGES

In modern conditions, information technologies are an important tool for adapting all companies, economic

sectors, and the state to globalization processes. The development of information technologies, and therefore the market, should ensure effective, safe and reliable interaction between all elements of the socio-economic system. The presence of large arrays of

digital information and their rational use by subjects of the information technology market contributes to the deepening of ties between them and ensuring effective global integration, such as: economic, political, cultural, as well as unification. Information technologies are used at all stages of the life of society and cover all spheres of the economy, which indicates that the IT sphere has budget-forming importance and the creation of conditions for the effective development of companies and the information technology market as a whole will contribute to increasing the level of economic development and speeding up the transition of the state and its regions to sustainable development.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS.

The main aspects of the study of the role of information technologies in ensuring economic growth and the potential of such a boom are considered in the works of a large number of scientists, in particular such as: Boiko N., Brozhyk L., Hamalii V., Honcharenko N., Hroznik A., Dmytryshyn B., Karpenko N., Koretska V., Koretskyi O., Meshko N., Sardak S., Sokol K., Stavytska A., Shlianchak S. and others. However, despite the presence of significant scientific work on the topic of the article, issues related to the study of the main aspects and role of information technology as a tool for companies' adaptation require in-depth consideration to the modern realities of the development of the economy of Ukraine.

FORMULATION OF THE ARTICLE OBJECTIVES (TASK STATEMENT)

The purpose of the article is to study the main aspects and role of information technologies as a tool for adapting companies to the modern realities of economic development of Ukraine in the context of ensuring its growth and accelerating the transition of the state and regions to sustainable development.

PRESENTATION OF THE MOST IMPORTANT RESEARCH MATERIAL, WITH A FULL JUSTIFICATION OF THE SCIENTIFIC RESULTS OBTAINED

Russia's full-scale invasion of Ukraine caused significant destruction of infrastructure (economic, military, social, civil, etc.), led to significant loss of human lives, economic losses, etc.

According to the assessment of the Cabinet of Ministers of Ukraine and the World Bank, \$486 billion will be needed to restore the Ukrainian economy over the next decade (a year ago, these needs were estimated at \$411 billion). Donetsk, Kharkiv, Luhansk, Zaporizhzhya, Kherson and Kyiv regions are the most affected — their restoration will require \$11 billion or more. Of this \$486 billion for recovery by percentage distribution: 17% — housing and communal sector; 15% — transport sector; 14% — industry and trade; 12% — agriculture; 10% — energy; 9% — social protection; 7% — demining and disposal of explosive objects [1].

These data also correlate with information about migration processes as a result of full-scale war.

According to the estimates of the CES, the Center for Economic Recovery and the Institute of Demography, there will be a shortage of 3.1—4.5 million workers by 2032 due to the departure of citizens of the country. As a result, the losses of the economy during this period may reach \$ 113 billion. The losses of the economy due to the drop in production and consumption (one of the important factors of this is the number of refugees, considering, in particular, how many of them may not return to Ukraine), will fluctuate in the range of 2.6—7.7% of GDP per year, which may grow in the long term, and this will also have a negative impact on the country's balance of payments, and therefore on the foreign exchange market. To some extent, the negative impact can be leveled out, given the fact that many refugees abroad continue to spend money from the Ukrainian banking system. So, in 2022, the scale of such expenses exceeded \$1.5 billion per month and \$5 billion per quarter. However, this impact cannot be assessed unequivocally, since the state of the balance of payments will largely depend on the volume and structure of investments in reconstruction [2—5].

According to the data of the European Business Association (EBA), in 2022, there was a decrease in business activity in 83% of the surveyed member companies of the association: in 29% the drop in business was up to 20%, in more than half — up to 21% and more, in 6% there were no changes and only 11% of them could boast of an increase in income [3—6]. In the context of the research problem, it should be noted that, in general, business survival from the beginning of the full-scale russian invasion of Ukraine was helped by: built trust and maintaining constant communication with its customers under normal conditions, which allowed to maintain relations even during a full-scale war; active participation in business communities in peacetime provided many businesses with quick support both in rescuing workers and their families from war zones, and in case of evacuation of warehouses or facilities to safer areas; personal leadership and harmonious team interaction with the rule of trust. This is a guarantee of efficiency under any circumstances. In times of war, when the speed of decision-making and real actions saves lives, such features as the ability to take responsibility, keep a "cool head", communicate correctly with employees, become decisive, and sometimes vitally necessary [2—4; 7].

Companies with strong potential are able to survive in modern conditions, improve their financial and economic indicators, but for this, the effective use of information technologies is important. In the context of the above, the so-called "drivers" can contribute to economic growth. In general, "drivers of economic growth are a set of mechanisms that capture demand, catalyze impulses, include at the appropriate stage various assets (material, financial, informational, labor) in the direction of movement, change the economic situation in the country" [8]. Before the full-scale invasion of russia into Ukraine, the main driver was internal consumption [8], which was significantly provided and supported by the development of the IT sphere. Currently, in order to survive and ensure the

future prosperity of the state, the need to develop and realize the market potential of information technologies and IT companies in the sphere as a whole is of great importance.

According to authoritative experts, the domestic field of IT has significant prospects for development in the period of post-war recovery — foreign investors are already interested in services that have been integrated at the state level, such as: international financial institutions are interested in digital tools that make it possible to control the target expenditure of financial resources [9]. At the same time, international organizations are also interested in commercial products from Ukrainian developers. Yes, the military sector is actively developing tech and related software developments, technologies and software of the financial and banking sector, automation of processes in various industries, such as logistics, transport, agrarian complex, various manufacturing industries, etc. In the period of post-war recovery, the latest technologies that speed up and increase the quality of construction and related processes will be in demand [9]. Such measures can be effective in the context of the formation of relevant strategies, which can be facilitated to a certain extent by intensifying efforts at all levels to increase the effectiveness of the use of information technology as a tool for adapting companies to the modern realities of economic development in Ukraine. Also, taking into account the prospects of Ukraine joining the EU, the undeniable advantages that will contribute to the development of the IT sphere, the market of information technologies and information technologies in general will be [9]: absence of customs duties and taxes on individual services and goods; absence of trade barriers, tax problems and regulatory obstacles; increasing opportunities to receive grants and subsidies from the European Union; the opportunity to participate in tenders on the territory of Europe; Ukraine will be able to become one of the main centers for the development and provision of information technology services, given the high level of qualification and affordable price policy; significant growth of investments in the industry; the opportunity to establish cooperation with EU companies; raising the level of the quality of education and relevant programs through the cooperation of national universities with EU educational institutions; improvement of security in the field of intellectual property. In 2023, the Ukrainian IT sector suffered both from the war and from negative macroeconomic trends: the number of vacancies decreased by an average of one third. at the beginning of the full-scale invasion, the labor market for the IT sector collapsed 7 times — from 9.8 thousand to 1.3 thousand vacancies. In September 2022, having reached a peak of 4,900 offers, vacancies in the IT sphere again declined [10]. By the end of 2023, the labor market in the "IT, computers, Internet" category had recovered by 57%. For comparison, the recovery of the labor market as a whole in Ukraine has already reached 90% [10]. According to the National Bank, the export of IT services for the first 3 quarters of 2023

showed a lack of positive dynamics." The main reasons for this are: the global economic slowdown (it has been observed for the past 2 years); due to the full-scale war, Ukraine as a hub for the development of digital solutions lost its attractiveness for foreign customers. Currently, there is a cautious attitude of international companies to the placement of new and continuation of existing projects in Ukraine [10].

According to the Lviv IT cluster, the median income of an IT specialist in Ukraine in 2023 was \$2.6 thousand, in 2022 this figure reached \$2.3 thousand. The average income of technical specialists is \$4.2 thousand, and non-technical — \$2.3 thousand [10]. In 2023, 2.1 thousand companies and 307 thousand specialists work in Ukraine, of which approximately 242 thousand are physically present in the country. Compared to 2022, the number of people working in the industry increased by 7.9%, and the number of those in Ukraine — by 6%. Ukrainian IT provides a 4.9% share in the country's GDP, the turnover of the industry in 2022 was \$7.96 billion [10]. In the course of 2022-2023, a general trend of staff reduction was observed in global IT. Thus, in 2022, a number of international companies began to cut back, which they continued in 2023. Both startups and tech giants like Amazon, Google, and Microsoft were laying off staff. In 2023, IT companies cut more than 257,000 employees. This trend also affected the Ukrainian IT sector. With regard to the forecasts on the labor market, no fundamental deterioration is predicted, with regard to salary increases, they are not predicted to be the same as in 2021, when people moved to a salary several times higher than the previous one, with regard to specialists, the demand for AI/ML is growing - specialists and the situation in Ukraine is no different from the rest of the world (the demand for AI/ML specialists will grow). Ukrainian technology companies are increasingly implementing AI solutions in their operations to optimize and reduce costs. The number of non-technical fields where AI is used is also growing: agronomy, medicine, the military sector. In general, the development of Ukrainian IT is predicted with restrained optimism: there are positive expectations regarding both recruiting and salary growth, but on the condition that there are no upheavals in the state [10].

CONCLUSIONS

Taking into account the above, it can be stated that the intensification of efforts at all levels of management regarding the development of information technologies as a tool for adapting companies to the modern realities of the economic development of Ukraine is possible in the case of the development and adoption at all levels of management of balanced decisions adequate to modern conditions and the development, as necessary, of the implementation of alternative options for strategies that will help not only to strengthen positions on the market, but also to promote the expansion of new ones, in particular through the use of so-called "drivers" of economic growth in the case of using the potential of IT companies and the field of information technologies and the market in general, which in general will contribute to ensuring the growth of Ukraine's

economy in the post-war period and the period of post-war recovery and accelerating the transition of the state and regions to sustainable development.

Література:

1. \$499 млрд становлять сукупні втрати України (економічні, соціальні та інші) від війни. URL: <https://www.ukrinform.ua/rubric-ato/3830500-499-mlrd-stanovlat-sukupni-vtrati-ukraini-ekonomichni-socialni-ta-insi-vid-vijni.html>

2. Вінокуров Я. Після війни додому можуть не повернутися 3 мільйони українців. Що буде з економікою? Виїзд мільйонів українців значно вплине на економіку України. Як уникнути найбільш негативного сценарію? URL: <https://www.epravda.com.ua/publications/2023/09/11/704143/>

3. Breus S., Harnaha M. Management potential: formation and development in the context of the post-war recovery of the economy of Ukraine. The 10th International scientific and practical conference "Innovative scientific research: theory and practice" (November 21—24, 2023) Stockholm, Sweden. International Science Group. 2023. 516 p. Pp. 86—91.

4. Бреус С. В., Гарнага М. А. Основні аспекти формування потенціалу менеджера. Стратегія розвитку України: фінансово-економічний та гуманітарний аспекти: матеріали X Міжнародної науково-практичної конференції. Київ, Інтерсервіс, 2023. 622 с. С. 378—383.

5. Denysenko M., Breus S., Panchenko V., Harnaha M. Economic security of the state as the basis structure of national security: investment management taking into account the importance of the development of the education system at all levels in the conditions of the post-war recovery of Ukraine. 3rd International conference on economics, accounting and finance (ICEAF). Scientific Center of Innovative Researches Ob. December 15, 2023. Pp. 27—29. URL: <https://conf.scnchub.com/index.php/ICEAF/ICEAF-2023/paper/view/683>

6. Жирій К. Час для роботи: як відновлювався та адаптувався український бізнес за рік війни. URL: <https://www.unian.ua/economics/finance/chas-dlya-roboti-yak-vidnovlyuvavsya-ta-adaptuvavsya-ukrajinskiy-biznes-za-rik-viyni-12154170.html>

7. Опацька С., Бойчук Я. 69% компаній мали план дій, якщо почнеться війна. Що саме допомогло бізнесу вижити. URL: <https://forbes.ua/lifestyle/69-kompaniy-mali-plan-diy-yakshcho-pochnetsya-viyna-shcho-same-dopomoglo-biznesu-vizhiti-03112022-9520>

8. Чотири драйвери зростання для української економіки. URL: <https://minfin.com.ua/ua/2019/03/18/37112326/>

9. Команда YC.Market. Перспективи розвитку IT-сектору в Україні. URL: <https://blog.youcontrol.market/pierspektivi-rozvitku-it-siektoru-v-ukrayini/>

10. Баловсяк Н. Стриманий оптимізм. З якими настроями український IT-ринок рухається у 2024 рік. URL: <https://proit.org.ua/strimanii-optimizm-z-iaкими-nastroiami-ukrayinskii-it-rinok-rukhaietsia-u-2024-rik/>

References:

1. Ukrinform (2024), "\$499 billion is all Ukraine's losses (economic, social and other) from the war", Available at:

<https://www.ukrinform.ua/rubric-ato/3830500-499-mlrd-stanovlat-sukupni-vtrati-ukraini-ekonomichni-socialni-ta-insi-vid-vijni.html> (accessed June 10, 2024).

2. Vinokurov, Ya. (2023), "After the war, 3 million Ukrainians may not return home. What will happen to the economy? The departure of millions of Ukrainians will significantly affect the economy of Ukraine. How to avoid the most negative scenario?", Available at: <https://www.epravda.com.ua/publications/2023/09/11/704143/> (accessed June 10, 2024).

3. Breus, S. and Harnaha, M. (2023), "Management potential: formation and development in the context of the post-war recovery of the economy of Ukraine", The 10th International scientific and practical conference "Innovative scientific research: theory and practice", International Science Group, Stockholm, Sweden, November 21—24, pp. 86—91.

4. Breus S. V, Harnaha M. A. (2023), "The main aspects of the formation of the manager's potential", Stratehiia rozvytku Ukrainy: finansovo-ekonomichni ta humanitarni aspekty: materialy X Mizhnarodnoi naukovo-praktychnoi konferentsii [Ukraine's development strategy: financial, economic and humanitarian aspects: materials of the 10th International Scientific and Practical Conference], Interservis, Kyiv, Ukraine, pp. 378—383.

5. Denysenko, M., Breus, S., Panchenko, V. and Harnaha, M. (2023), "Economic security of the state as the basis structure of national security: investment management taking into account the importance of the development of the education system at all levels in the conditions of the post-war recovery of Ukraine", 3rd International conference on economics, accounting and finance (ICEAF), Scientific Center of Innovative Researches Ob, December 15, Pp. 27—29, Available at: <https://conf.scnchub.com/index.php/ICEAF/ICEAF-2023/paper/view/683> (accessed June 10, 2024).

6. Zhyrii, K. (2023), "Time for work: how Ukrainian business recovered and adapted during the war year", Available at: <https://www.unian.ua/economics/finance/chas-dlya-roboti-yak-vidnovlyuvavsya-ta-adaptuvavsya-ukrajinskiy-biznes-za-rik-viyni-12154170.html> (accessed June 10, 2024).

7. Opatska, S. and Boichuk, Ya. (2022), "69% of companies had a plan of action if war broke out. What exactly helped the business to survive", Available at: <https://forbes.ua/lifestyle/69-kompaniy-mali-plan-diy-yakshcho-pochnetsya-viyna-shcho-same-dopomoglo-biznesu-vizhiti-03112022-9520> (accessed June 10, 2024).

8. minfin (2019), "Four growth drivers for Ukrainian economy", Available at: <https://minfin.com.ua/ua/2019/03/18/37112326/> (accessed June 10, 2024).

9. YC.Market (2024), "Prospects for the development of the IT sector in Ukraine", Available at: <https://blog.youcontrol.market/pierspektivi-rozvitku-it-siektoru-v-ukrayini/> (accessed June 10, 2024).

10. Balovsiak, N. (2023), "Restrained optimism. What are the moods of the Ukrainian IT market moving into 2024", Available at: <https://proit.org.ua/strimanii-optimizm-z-iaкими-nastroiami-ukrayinskii-it-rinok-rukhaietsia-u-2024-rik/> (accessed June 10, 2024).

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