

DIRECTIONS FOR THE DEVELOPMENT OF E-BUSINESS IN UKRAINE IN THE CONTEXT OF THE WAR WITH THE RUSSIAN FEDERATION

НАПРЯМКИ РОЗВИТКУ ЕЛЕКТРОННОГО БІЗНЕСУ В УКРАЇНІ В УМОВАХ ВІЙНИ З РОСІЙСЬКОЮ ФЕДЕРАЦІЄЮ

Before the military invasion of Ukraine by the Russian Federation, Ukrainian business was developing rapidly. As a result of the hostilities, the industry's infrastructure was destroyed, logistics chains were severed, and a significant number of specialists fled Ukraine or joined the Armed Forces of Ukraine to defend the country. Nevertheless, in 2022, IT revenues as the main part of e-business grew by 7%, compared to annual growth of 20-30% in the pre-war period. The study examines the most important areas of e-business development in Ukraine through wartime in the context of such economic models as G2B (Government-to-Business), B2G (Business-to-Government), and B2E (Business-to-Employees). The findings of the study can be used to complement the strategy of Ukraine's economic recovery in the postwar period.

Key words: digitalization, e-business, renovation, taxation, Ukraine.

До початку військового вторгнення в Україну з боку Російської Федерації український бізнес стрімко розвивався. Внаслідок бойових дій інфраструктура галузі була зруйнована, логістичні ланцюги розірвані, а значна кількість фахівців опинилася за межами України або захищає її у складі Збройних Сил України. Тим не менш, у 2022 році доходи ІТ-індустрії як основної частини електронного бізнесу зросли на 7%, порівняно зі щорічним зростанням на 20–30% у довоєнний період. У дослідженні розглядаються найважливіші напрямки розвитку електронного бізнесу в Україні у воєнний час у контексті таких економічних моделей, як G2B (Government-to-Business), B2G (Business-to-Government) та B2E (Business-to-Employees). Метою дослідження є підтвердження або спростування трьох гіпотез. Перша гіпотеза ґрунтується на тому, що подальший розвиток електронного бізнесу в Україні та його функціонування в європейському економічному просторі вимагає готовності українського суспільства до цього. Друга гіпотеза пов'язана з твердженням, що відновлення економіки України та розвиток електронного бізнесу можливий лише за умови впровадження інформаційно-комунікаційних технологій в усі сектори економіки, в тому числі шляхом підвищення цифрової грамотності населення. Третя гіпотеза розглядає вплив держави на розвиток ринку праці в ІТ та, як наслідок, на розвиток електронного бізнесу в майбутньому. Висновки щодо підтвердження чи непідтвердження визначених гіпотез були зроблені на основі аналізу результатів опитування. За результатами дослідження підтвердилася перша гіпотеза, оскільки було виявлено, що існують достатні передумови для успішної інтеграції українців у західне суспільство. Друга гіпотеза підтверджується тим, що рівень медіаграмотності більшості українців дозволяє їм бути активними споживачами товарів і послуг, які пропонують підприємства електронного бізнесу в Інтернеті. Третя гіпотеза вважається непідтвердженою. Результати дослідження можуть бути використані для доповнення стратегії повоєнної економічної відбудови України.

Ключові слова: діджиталізація, е-бізнес, реновація, оподаткування, Україна.

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Setting problems. Electronic business (e-business) emerged in the second half of the twentieth century. Since then, it has been increasing its share constantly in the world economy. Every year the growth rate of e-business is accelerating. In the nearest future, every inhabitant of our planet will be directly or indirectly involved in e-business as an owner, co-owner, manager, employee, or consumer. The constant development and improvement of technology on a global scale, and the access to the number of goods and services that the inhabitants of the planet have now – make buying and selling online easier than ever before. More and more businesses are moving from the "physical" to the "virtual" world [2; 3].

According to preliminary estimates, an additional USD 13 billion will be added to global GDP by 2030 through the use of digitalization, automation, and artificial intelligence, as these technologies create new business opportunities and efficient product chains. In Ukraine, most IT companies are e-business enterprises, as almost all business processes are

carried out using information and communication technologies. Russia's large-scale military aggression in Ukraine has had severe consequences for the Ukrainian economy. As of the beginning of September 2022, the Ministry of Communities and Territories Development of Ukraine, together with the World Bank, has verified \$326 billion in losses caused by Russia. In the first quarter of 2022, Ukraine's GDP decreased by 15.1% compared to the same period in 2021, in the second quarter of 2022, the National Bank of Ukraine estimates a drop in GDP at 39.3% compared to the same period of the previous year [1].

The industries most affected by the war were metallurgy, machine building, agriculture, and construction. At the same time, e-business enterprises adapted to new challenges much faster. According to the results of the 1st half of 2022, these enterprises showed an increase in the volume of activities and expanded the list of vacancies. To determine the reaction of Ukrainian businesses to the war, Forbes Ukraine conducted a survey among one hundred and fifty private Ukrainian companies and banks on key

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performance indicators for the first seven months of the war. They calculated a list of company resilience, taking into account such indicators as the number of employees, physical production volumes, taxes paid, network development dynamics, etc. The list of analyzed companies includes IT companies with more than 2500 employees, banks with assets of more than UAH 10 billion, and enterprises of other industries with estimated or actual revenue for the first half of 2022 exceeding UAH 2 billion. As a result of the survey, a rating of 30 companies that proved to be the most stable during the war period was determined.

Given the difficult economic situation in Ukraine due to the war and the ability of e-business enterprises to function and grow under uncertainty, the development of e-business can become one of the drivers of economic recovery in the post-war period.

Analysis of recent research and publications.

The peculiarities of the creation and operation of e-business enterprises, their common and distinctive features with e-commerce, the impact on economic development in the international context and the global labor market are considered in D. Chaffey [2], J. Humphrey, R. Mansell, D. Paré, H. Schmitz [3], M. McConnell, B. Schninger [4], D. Rotman [5], V. D. Soni [6], P. Weill, M. R. Vitale [8].

Objectives of the article. The research is based on hypotheses: H1. The restoration of Ukraine will take place in the direction of its integration with Western civilization. H2. The restoration of Ukraine and its further development is possible only with the introduction of information and communication technologies in all spheres of the economy, including by increasing the digital literacy of the population. Reconstruction of the Ukrainian economy according to the previous ("resource") type is inefficient and will not have positive consequences. H3. Creating effective conditions at the state level for the development of e-business, including providing the labor market with IT specialists. This will allow realizing the ambitious goal of Ukraine "31 (from 3 to 1)", which means the transformation of Ukraine from a third-world country into a country with a strong economy through the use of modern knowledge and technology, bypassing the 2nd phase – industrial economy. The purpose of the study is to confirm or refute the given hypotheses.

Presenting main material. E-business is a business that uses information and communication technologies at all stages of economic activity. E-business includes buying and selling, inventory, customer service, payment transactions, product management and control, interaction with business partners and employees, search and hiring of new employees, etc. [8].

Depending on which participants are involved in the process of business communication and what

issues are solved with its help, different models of e-business are distinguished. Parties to business communications can be enterprises (B), consumers (C), the state (G), and employees (E). Separate e-business models are digital platforms and e-services. In this study, we focused on such business models as G2B, B2B, and B2E. Within the framework of this study, an analysis of the current legislation of Ukraine regulating e-business in Ukraine was carried out. The analysis of the provisions of the current legislation of Ukraine, which are directly or indirectly related to e-business in Ukraine, allowed us to specify and systematize the results obtained and determine the ways of further transformations in Ukraine. Information on the performance of enterprises in Ukraine is currently not made public. Data on economic indicators were obtained from the official websites of state bodies (the Cabinet of Ministers of Ukraine, the Ministry of Finance of Ukraine, the Ministry of Digital Transformation of Ukraine, the Ministry for Development of Economy, Trade, and Agriculture of Ukraine), analytical reports of social institutions (Kyiv School of Economics, Ukrainian Institute for the Future), specialized publications (Forbes Ukraine, AIN.Business, NV Business). A survey was conducted to determine the level of readiness of society for further transformations.

The data used in this study were obtained as a result of the survey. The questionnaire was composed using different types of questions that helped to determine the position of the respondent. Of the 85 questionnaires sent, 67 were filled out in full and were deemed to be usable for the study. Only adult citizens of Ukraine participated in the survey, regardless of gender, age, education, and current employment. The questionnaire offered for completion contained 15 closed questions, which can be divided into three blocks: 1) the first block defines the demographic characteristics of the respondents; 2) the questions of the second block are devoted to the experience of the consumer of goods and services of e-business enterprises; 3) the third block contains questions that help to determine the respondent's desire or unwillingness to work in the IT sphere. Data analysis was carried out using statistical methods and included survey data obtained from open official sources.

According to various estimates, Ukraine's GDP in 2022 will decrease by 35-50%, every second enterprise may be closed. Based on this, it is clear that in the coming years Ukraine will be a subsidized state, where the state will be the main investor for a certain period. The priorities set by the state will determine how long Ukraine will overcome the crisis. The main indicators of the Ukrainian economy for 2021-2023 are shown in Fig. 1.

The information in Fig. 1 shows that Ukraine is dependent on external borrowings, which allow the

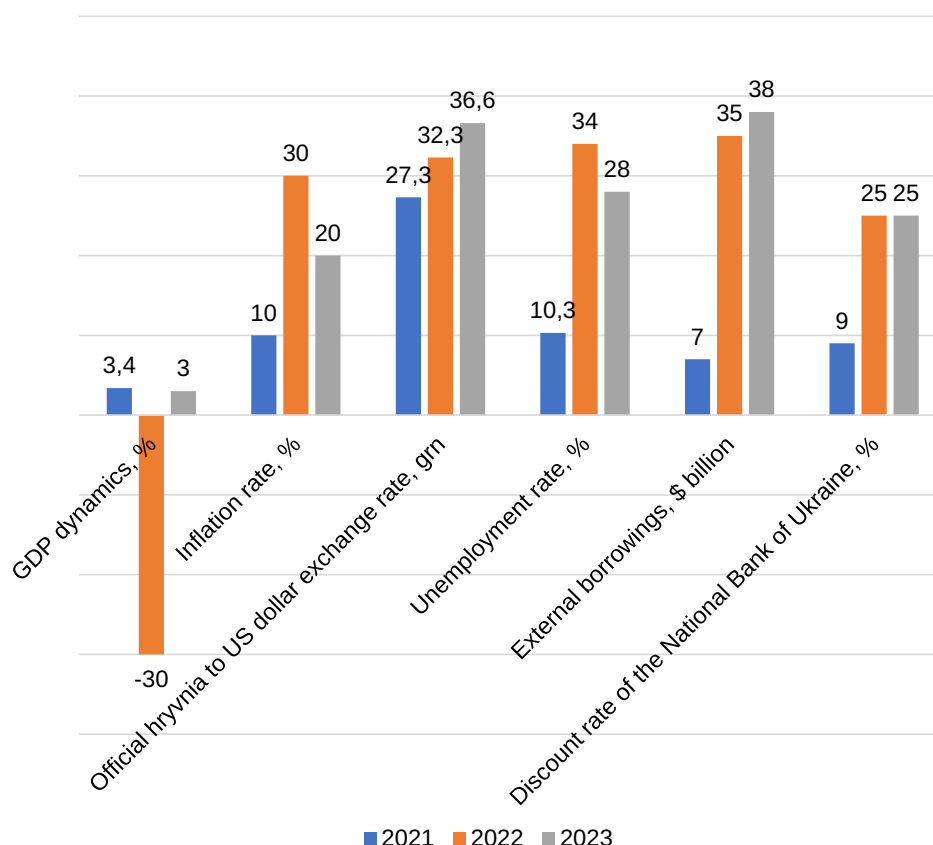


Figure 1. Macroeconomic indicators of Ukraine for 2021–2023 (forecast)

economy to function and reduce the need for additional emissions of national currency. Among other donor assistance that Ukraine received from partner countries was the Digital Europe project. To support Ukrainian businesses affected by the military aggression of the Russian Federation, the EU has assisted the possibility of Ukrainian companies' participation in the Digital Europe project in the amount of 7.5 billion euros in 2022–2027. The priority areas to be funded by the EU are high-performance computing; artificial intelligence; data, cloud services and cybersecurity; digital skills; use of digital technologies in the economy and society. This funding will be aimed at accelerating economic recovery, shaping the digital transformation of European society and economy. Among the priority areas of the post-war recovery of Ukraine, we will name those that are directly or indirectly related to e-business: increasing exports of goods and services; attraction of private investments; state orders for e-business enterprises; combating unemployment and loss of specialists; growth of science intensity of the economy.

Most of Ukraine's e-business enterprises are IT companies. Before the war, Ukraine's IT industry grew by 25–30% annually and in 2021 it became a key category in the export of services: the share of IT in the export of all services was 37%. Ukraine was one of the largest exporters of IT services in Europe. In 2021, Ukraine exported \$6.8 billion worth of IT

products, which is \$1.8 billion more than in 2020. In 2020, the IT industry generated twice as much export revenue as the gas transmission system and 1.5 times more than mechanical engineering. The main market for computer services from Ukraine is the United States (40% of exports). In second place is the United Kingdom (10% of IT exports). Until February 24, 2022, the IT industry was the most dynamic sector of the Ukrainian economy, with the number of employees growing by tens of thousands every year. At the beginning of 2022, 285 thousand of specialists worked in IT in Ukraine. During the year, the number of employees in the industry increased by 40 thousand people. In 2020, the IT industry paid UAH 17.2 billion in taxes and fees [7]. Currently, e-business in Ukraine needs support for further development. Let us consider potential directions of e-business development in Ukraine in the context of different business models (G2B, B2G, B2E).

G2B (Government-to-Business). The Law of Ukraine "On Stimulating the Development of the Digital Economy in Ukraine" was adopted to stimulate the development of the digital economy in Ukraine by creating favorable conditions for innovative business, building digital infrastructure, attracting investments, as well talented specialists. It regulates the creation of a special legal regime for IT companies in Diia. City. Diia.City residents can be companies that carry out their activities in the following areas: software

development and testing, including the publication of computer games; publishing and distribution of software, including SaaS; e-sports; computer literacy training, programming, testing, and technical support of software; cybersecurity; R&D in the field of IT and telecom; digital marketing and ads using software developed with the participation of residents; supply of services related to the circulation of virtual assets; work with virtual assets; and other services.

Existing companies must meet the following conditions: average remuneration equivalent to EUR 1200; 90% of revenues from qualified activities; the number of employees/GIG specialists for the reporting period, not less than 9 people. Startups must meet the following conditions: the amount of annual income does not exceed UAH 7.5 million; 90% of income from qualified activities; registered not earlier than 24 months before the date of application for residence. According to the Ministry of Digital Transformation, as a result of the launch of Diia City, the IT market in Ukraine will grow from \$6+ billion to \$12 billion per year. By 2025, the number of jobs in the industry will increase to 450,000. This will have a positive impact on the economy as a whole, as well as on the development of related industries.

B2G (Business-to-Government). The war economy involves close interaction between businesses and the state. Ukrainian IT companies have confirmed their patriotism and professionalism through their actions. Ajax System specialists invested \$200,000 in the Air Alert application, which is in general use and has been downloaded by 10.5 million Ukrainians. In addition, IT companies have developed software for the army on a paid and pro bono basis (Table 1).

Government orders can become an effective driver for startups in the defense industry or a source

of funding for existing e-businesses. The Ministry of Defense spent UAH 196 million on management systems in 2018, UAH 568 million in 2019, UAH 189 million in 2020, and UAH 163 million in 2021. Despite the opportunities for e-business in the Ukrainian defense industry, e-business requires a significant number of solvent customers who can and like to buy online. According to the survey results, it can be concluded that a significant number of Ukrainians have a fairly high level of digital literacy and are regular consumers of goods and services sold or provided online. In particular, assessing the demographic characteristics of respondents, the following can be noted.

Among the respondents, 65% are women, and 35% are men. The majority of respondents (47%) belong to the age group of 31-45 years; the second largest group by age criterion (31%) are respondents aged 46-60 years; the smallest number of respondents (22%) belong to the age group of 18-30 years. The information in Fig. 2 shows that 90 % of respondents have higher education or scientific degrees. Only 12% of respondents indicated that they do not speak English, 34% of respondents can use English at a basic level, and 46% of respondents speak English at a level that employs in various sectors of the economy. In our opinion, an important question was "Have you been abroad at least once in your life?". We believe that even a short-term experience in another country allows a person to form tolerance and respect for other cultures and people. The answer "yes" to this question was received by 68% of respondents, and the answer "no" by 32% of respondents.

The questions of the second block of the questionnaire aimed to determine the willingness of Ukrainians to buy online and their level of satisfaction

Table 1

Software developed by Ukrainian IT companies for defense needs

Product name, year of development	Purpose
Developed on a volunteer basis	
UKROP (MyGun), 2009	The calculation for artillery firing, offline map, orientation
GisArta, 2014	Orientation, planning, and calculation for artillery firing
Kropyva, 2014	The calculation for artillery firing, planning, and tactical situation
TOPO («Topyk»), 2014	Orientation, tactical situation
Bronia, 2015	The calculation for firing grenade launchers, mortars, and tanks; orientation
Terminal, 2015	The tactical situation, orientation
ComBat Vision, 2015	Intelligence, orientation, decision support
Delta, 2016	Orientation, tactical situation, unit management
MilChat, 2018	Messaging, tactical situation, geoposition broadcasting
Developed by state order	
Dzvin-AS, 2016	Management and control of combat operations at the command level
Virazh-planshet, 2016	Collection, display and analysis of information about the air situation
Prostir, 2021	Management of troops and weapons at the brigade level

[Author's generalization]

with the use of various online products. The question "Do you have a positive experience of online shopping on Ukrainian websites?" was answered "yes" by 85% of respondents, and "no" – by 15% of respondents. The share of respondents who have a positive experience of online shopping on foreign sites is lower (63%), and the share of those who do not shop online abroad is 37%. Exploring the sectoral aspect of consumers' use of software applications, it should be noted that 91% of respondents use online banking, respectively, 9% do not use applications of financial institutions. In the process of digitalization of the economy, the Ministry of Digital Transformation has developed the Diia application, which soon should replace the extensive network of state institutions and make most public services available online. According to the survey, 74% of respondents use this application, while 26% of respondents do not use it. The most common devices used by Ukrainians for work, shopping, and entertainment online are smartphones – 62% of respondents use them, 27% of respondents use computers and laptops, and 11% – tablets.

B2E (Business-to-Employees). Creating a positive image of using gadgets and software products in professional activities is one of the ways to popularize IT professions. This approach is of strategic importance, as automation, artificial intelligence, and robots will have a great impact on employment shortly. It is predicted that by 2050, about half of the jobs in the US will be automated [5]. The proliferation of technology and demographic changes will affect more than 800 million people on the planet by 2030, and 375 million will be forced to change their professions and acquire new skills [4; 6]. The problem of staffing is relevant for Ukrainian IT companies. Before the war, there was a shortage of IT professionals in Ukraine, as the industry was growing rapidly. After the war, the situation will worsen as a significant number of IT specialists left Ukraine and may not return.

Before the war, there were 150 educational institutions in Ukraine out of 1700 that offered bachelor's degree programs in IT. Every year they graduated with 16–17 thousand bachelors. The higher education system could not meet the demand of the IT market for specialists. The level of training of graduates also did not meet the requirements of companies. Therefore, an informal IT education market appeared in Ukraine in parallel. At the same time, IT companies created their training centers. 8 out of 10 companies financed educational projects. In 2021, corporate and private IT education trained 12 thousand of new IT specialists. In the coming years, according to pre-war forecasts of the IT Association, the number of trained outside the state higher education system was to increase to 20-25 thousand specialists per year. The military

aggression has intensified the state's actions in the field of training IT specialists through the launch of the IT Generation project. IT Generation is a project of the Ministry of Digital Transformation together with partners, blockchain ecosystem Binance, and Lviv IT Cluster. As part of the project, Ukrainian citizens can get a profession in the IT field for free. Operational support for IT Generation is provided in cooperation with the USAID Competitive Economy of Ukraine Program and with the technical support of the UNDP Project "Digital, Inclusive, Accessible: Supporting the Digitalization of Public Services in Ukraine".

The unemployment rate in Ukraine in 2022 will be 34%, according to forecasts in 2023 it will decrease to 28%. A significant part of Ukrainians who became internally displaced persons lost their jobs or did not find a job in their specialty in a new place. According to the results of the survey, the following was found. Only 40% of respondents gave an affirmative answer to the question "Do you work according to your education?". In the survey, we did not specify whether this situation is related to the war or took place before it started. We have determined that 60% of respondents do not work by their specialty. Which was obtained as a result of training.

Although the majority of respondents do not work according to their education, 53% of respondents are not going to change their profession in the next year. Thus, only 47% of respondents intend to get a new profession in the nearest future. The desired amount of monthly income that is lower than \$ 500 is desired by 68% of respondents, 18% of respondents expect to receive an income from \$500 to \$ 1000, and more than \$ 1000 – 14% of respondents. To the question "Do you consider one of the IT specialties as an alternative profession?", 45% of respondents answered "yes", and 55% – "no".

Specialists of e-business enterprises found that those IT teams where participants, in addition to hard skills, have a significant amount of soft skills work more efficiently, and recruiters are more likely to invite candidates with available soft skills to IT positions. Assuming that the survey participants may be interested in retraining as IT specialists, in the last question of the third block of the questionnaire, we asked them to rank the importance of these groups of soft-skills by their importance for the respondents. Participants had to choose a value from 1 to 10, where 1 is the "least important group of indicators", and 10 is the "most important group of indicators". The results are shown in Fig. 2.

Conclusions and prospects for further research. E-business in Ukraine has developed rapidly and in 2021 showed the best performance in the entire history of its existence. The military aggression of the Russian Federation against Ukraine destroyed the built business processes and made

Importance of different soft skills groups for respondents

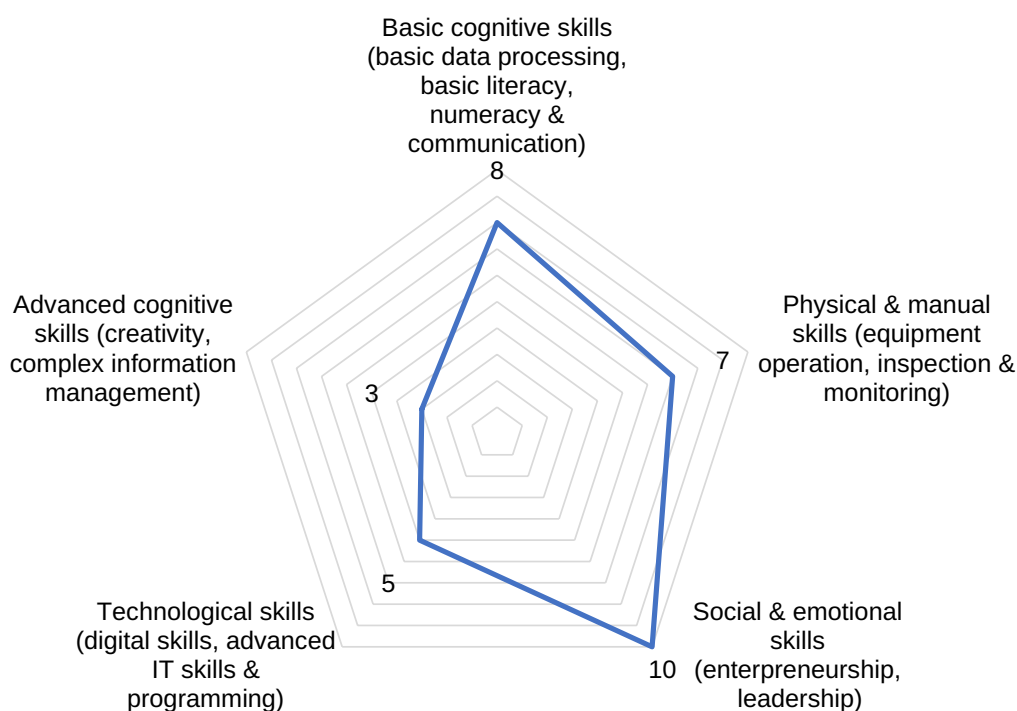


Figure 2. Importance of different soft skills groups for respondents

significant adjustments to the activities of e-business enterprises. Despite the difficult conditions, a significant part of e-business enterprises showed an increase in performance indicators or managed to keep the volume of activities at the pre-war level. The peculiarities of e-business enterprises, the main resource of which is human resources, and the speed of relocation and resumption of work in a new place is high, allowing us to consider affection for business as one of the industries that can lead Ukraine out of the post-war crisis.

The study considered the directions of e-business recovery in Ukraine according to several models (G2B, B2G, B2E). The G2B model (Government-to-Business) involves government actions aimed at supporting e-business enterprises. In particular, to stimulate the development of the digital economy in Ukraine, a special legal regime for IT companies Diia City was created. The B2G model is based on business contributions to the processes of state governance. Currently, martial law is in effect in Ukraine, and a significant part of IT specialists are mobilized to the Armed Forces of Ukraine, others create software applications for military use, including on a volunteer basis. The B2E model of e-business includes the training of IT specialists by potential employers or other private educational firms. Ukraine, with the support of international organizations, has created the IT Generation training program for IT specialists. With its help, Ukraine wants to increase the number of IT workers, including e-business, as

a significant number of specialists ended up abroad and were employed there.

Summarizing the answers to the questions of the first block of the questionnaire, which is related to the demographic characteristics of the respondents, it can be noted that the majority of Ukrainians are educated, speak English at least at a basic level, have experience of intercultural communication due to staying in another country. Based on the above, we can note that there are prerequisites for the successful integration of Ukrainians into Western society. Therefore, the first hypothesis (H1) of this study can be confirmed.

The second block of questions was devoted to the study of the digital literacy of Ukrainians, which is directly related to the ability to make purchases online, that is, to be consumers of goods and services offered by e-business enterprises. According to the results of the study, it can be argued that, among various applications, Ukrainians are most "accustomed" to using online banking. It is used by 91% of respondents. Buying goods and services online is also common among respondents. At least one positive experience of purchasing goods and services on Ukrainian websites was reported by 85% of respondents. The share of respondents who have made purchases on foreign sites is lower and amounts to 63% of those who have had such experience and 37% – of those who have not made purchases on foreign sites. The involvement of respondents in the consumption of public services online was lower

compared to financial institutions and retail. Thus, 74% of respondents use the Diia application (portal of public services), but, in our opinion, this figure is still high, given how long the population has associated public services with "waiting in queues" and "visiting endless offices". More than half of respondents (64%) use a smartphone to access the Internet, 27% – computers, and 11% – tablets. The results of the analysis of the second block of indicators show that the level of media literacy of the majority of Ukrainians allows them to be active consumers of goods and services offered by e-business enterprises online, which confirms the second hypothesis (H2).

The third block of questions was aimed at identifying trends in society regarding potential employment in the IT sphere. Even though most respondents (60%) do not work in their profession, only 47% of respondents expressed a desire to learn new things. The majority of respondents (68%) consider a monthly income below \$500 to be desirable. IT specialties are not extremely popular among the survey participants, only 45% answered "yes" to the question "Do you consider one of the IT specialties as an alternative profession?". In the study of respondents' attitudes to the importance of soft skills in obtaining a new specialty, the most important according to respondents are Social & emotional skills (entrepreneurship, leadership) (10 points) and Basic cognitive skills (basic data processing, basic literacy, numeracy & communication) (8 points). The least important according to the respondents were Advanced cognitive skills (creativity, complex information management) (3 points) and Technological skills (digital skills, advanced IT skills & programming) (5 points). Taking into account the results of the study, we consider the third hypothesis (H3) to be unconfirmed, since a significant number of respondents did not show a desire to obtain an IT specialty as an additional one, and soft skills important for this area of activity were not important enough for the respondents, which complicates their potential development in this profession.

The area for further research is the tax burden of e-business enterprises in Ukraine and its impact on the efficiency of e-business enterprises.

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