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ANALYZING THE PECULIARITIES OF THE DEVELOPMENT OF IT COMPANIES IN THE WARTIME AND REGARDING THE POST-WAR CONDITIONS

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Denysiuk O. V., Kulikov O. P. Analyzing the Peculiarities of the Development of IT Companies in the Wartime and Regarding the Post-War Conditions

Economic models of world development are characterized by circularity, digitalization and smartization, the active use of scientific and technological achievements in products and technologies, the focus of entrepreneurs' attention on the creation of strategic knowledge, the formation of unique competencies, the development of new business ideas and their application to obtain competitive advantages in the market. For IT companies, solving these issues is the most urgent, since the IT industry is the most dynamic, it is developing very rapidly, changing and significantly affecting other industries. Also, it should be noted that for domestic IT companies, the conditions for their development are complicated due to hostilities on the territory of Ukraine, the need to relocate businesses, the risks of losing customers and highly qualified personnel, reduced investment in startups. Despite the fact that in 2022 the IT industry provided foreign exchange earnings to the Ukrainian economy (an increase of 5.8% compared to pre-war 2021), there is a significant slowdown in the growth rate of the IT industry compared, for example, with the period 2015–2021, when exports of computer services grew by an average of 26.8% annually. Therefore, the task of analyzing the features of the development of IT companies in the wartime and regarding the post-war conditions is important and relevant for creating security conditions and substantiating the directions of their sustainable development. The article analyzes changes at the global and international levels of the IT industry; the experience of strengthening and consolidating the largest digital IT companies in the market is considered; the negative impact of the decrease in the activity of foreign venture funds to support startups is studied; the level of the State support for enterprises of high-tech industries is characterized.

Keywords: digital economy, IT industry, State support, trends, analysis, development potential, risks.

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Денисюк О. В., Куліков О. П. Аналіз особливостей розвитку ІТ-компаній у воєнних і повоєнних умовах

Економічним моделям світового розвитку притаманні циркулярність, цифровізація та смартизація, активне використання науково-технічних досягнень у продуктах і технологіях, фокусування уваги підприємців на створенні стратегічних знань, формуванні унікальних компетентностей, розробленні нових бізнес-ідей та їх застосуванні для отримання конкурентних переваг на ринку. Для ІТ-компаній вирішення цих питань є найбільш актуальним, оскільки ІТ-галузь є найбільш динамічною, вона дуже швидко розвивається, змінюється та значно впливає на інші галузі. При цьому слід зазначити, що для вітчизняних ІТ-компаній умови їх розвитку ускладнюються через ведення бойових дій на території України, необхідність релокації бізнесу, ризики втрати замовників, висококваліфікованих кадрів, скорочення інвестицій на стартапи. Попри те, що у 2022 р. ІТ-індустрія забезпечила валютні надходження до української економіки (приріст склав 5,8% порівняно з довоєнним 2021 р.), спостерігається суттєве сповільнення темпів зростання ІТ-галузі порівняно, наприклад, з періодом 2015–2021 рр., коли експорт комп'ютерних послуг зростав у середньому на 26,8% щороку. Тому завдання щодо аналізу особливостей розвитку ІТ-компаній у воєнних і повоєнних умовах є важливим та актуальним для створення умов безпеки та обґрунтування напрямків їх стійкого розвитку. У статті проведено аналіз змін на глобальному та міжнародному рівнях ІТ-галузі; розглянуто досвід зміцнення та закріплення на ринку найбільших цифрових ІТ-компаній; досліджено негативний вплив зниження активності закордонних венчурних фондів для підтримки стартапів; охарактеризовано рівень державної підтримки підприємств високотехнологічних галузей.

Ключові слова: цифрова економіка, ІТ-галузь, державна підтримка, тенденції, аналіз, потенціал розвитку, ризики.

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The trend of total digitalization of the business environment has actuated the function of IT companies, intensified competition among companies in the IT services market, opened up huge opportunities for innovative development through the introduction of information and communication technologies, artificial intelligence achievements, broadband Internet access. Personal computers, fast Internet, smartphones, information in clouds or social networks are yesterday's news. Modern trending and the business environment are characterized by the use of big data analytics, nanotechnology, smart devices (transmitters and sensors, drones, smart homes and equipment, VR/AR, etc.). The trends of the future will be formed on the use of artificial intelligence, blockchain and cryptocurrency, 3D printing, self-driving machines, new technologies in energy, implant technologies, robotics, distributed computing, and the sharing economy. These events and facts are signs of the global digital and circular economy, explaining the leading positions of IT companies in international markets in the rankings of innovativeness and competitiveness [1].

The aim of the article is to analyze the conditions of activities of IT companies and substantiate the choice of directions along with the development of strategic measures toward strengthening their competitive positions in both the domestic and the international markets.

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Nowadays, the influence of IT technologies on all spheres of economic, technological, and social phenomena cannot be ignored [1–3]. In the economic sphere, these are healthcare sectors, the agricultural sector, high-tech industries related to the development of ICT technologies, achievements and implementation of research results in chemistry, biology, medicine, space, etc. In addition to the economic effect of business development, information and telecommunication technologies have a huge potential to solve urgent social problems and to persuade the business actors to operate according to the principles of social and ecological responsibility (Tbl. 1).

The State support for the priority sectors of national economy, together with the sectors that are strategically important for the national security, is actively used by the countries around the world, as evidenced by their innovation ratings. The ranking conducted in 2021 by the world-famous consulting agency Bloomberg (Bloomberg Innovation Index, or IIB) presented as the top ten countries South Korea, Singapore, Switzerland, Germany, Sweden, Denmark, Israel, Finland, the Netherlands, and Austria [4; 5]. The methodology for calculating indicators corresponded to the following areas: research and development, productivity, added value of production, density of high-tech companies, concentration of researchers, efficiency of higher education and patent activity.

The top positions of countries were determined by the priority areas of their development. Thus, the second place (Singapore) was ensured by the values of indicators in the categories of «manufacturing productivity» and «efficiency of higher education».

Some manifestations of influence of IT technologies on the ways of conducting business

| Manifestations of application of IT technologies | Examples |
|--|--|
| Development of the biotechnology market | The first-rate in the growth of global pharmaceutical companies developing vaccines against COVID-19: Moderna, a biotechnology company that develops vaccines and medicines to be easily transportable; Pfizer (in partnership with BioNTech), another pharmaceutical company of the highest rank |
| Digital transformation of business processes, as confirmed by the rankings of the most innovative companies in the world | The following examples regard the introduction of digital technologies into the business processes of the world's leading companies: Stitch Fix (the USA), the company with 5800 employees and the capitalization amounting to \$2 billion, uses artificial intelligence when selecting clothes for the customer; The Walt Disney Company (the USA) specializes in the development of innovative technologies in the fields of multimedia, robotics, computers, astronautics, etc.; Oatly has developed and applies an enzyme technology for the production of oat milk and dairy products |
| Advanced practices for the application of Internet of Things (IoT) technology in medicine | Philips, manufacturing medical devices such as Magnetic Resonance Imaging (MRI), Positional Emission Tomography (PET) scanners and Computed Tomography (CT) equipment, enabling remote monitoring, predictive maintenance and extended service life |
| Application of machine learning and artificial intelligence | Siemens has optimized the combustion processes of gas turbines. In a series of tests, the machine learning system was able to reduce nitrogen oxide emissions by 20%. Thanks to sophisticated neural networks, it has been possible to achieve results that surpass the performance of human experts |
| Combinatorial effects of the application of 4IR technologies in the agrarian sector | The use of aeroponics and predictive analytics allows AeroFarms to achieve high agricultural productivity, reduce resource consumption and waste generation, while improving product quality |

The indicators of innovation for Switzerland (3rd place) are explained by the areas of «research and development» (3rd position), «concentration of researchers» (4th position), «added value of production» (5th position). Ukraine's place in the innovation ranking of 2021 corresponded to the 58th position among 60 countries of the world. For comparison, the ratings of the Baltic countries were as follows: Latvia took the 34th position, Estonia the 39th position, and Lithuania the 40th position. And this indicates a successful result when considering innovative development.

It should be noted that the support of priority high-tech industries has become important prerequisites for the «economic miracle» of the countries known as the «Asian Tigers». In particular, Taiwan has approved the following criteria for determining strategic industries: extensive ties with other sectors of the economy, high market potential, technological intensity, high level of added value, low energy intensity, environmental friendliness» [6].

In the USA, the choice of strategically important industries is approved by the Supply Chain Resilience Plan by the administration of President Joe Biden [7]. The defined areas of the State support are the production of semiconductors, high-capacity batteries, pharmaceuticals and active pharmaceutical ingredients, hauling minerals of crucial importance etc. «In particular, it is in-

tended to spend \$50 billion on the development of semiconductor production by domestic manufacturers in the United States, the launch of loan and grant programs to finance national battery production, the extension of preferences in public procurement for defense products to all crucial sectors, increased funding for leading technologies for the production of active pharmaceutical ingredients, the introduction of investment and technical support programs for small and medium-sized enterprises in four strategic industrial sectors, etc.» [7].

The EU countries have identified priority key enabling technologies that are «the most promising for the development of a wide range of sectors of the economy and socioeconomic development in general. This includes advanced industrial technologies (robotics, 3D printing, computer modeling, etc.); advanced materials; technologies related to life sciences; microelectronics, nanoelectronics and photonics; artificial intelligence, digital security, and communication» [8]. In these areas, a number of problematic issues have arisen regarding the insufficient level of development and growing dependence on imports of materials and technologies crucial for the EU economy. In 2021, the industrial policies of the EU countries were revised, the sectoral priorities of industrial development were specified and closer defined «with increased support for ensuring the sustainability of supply chains in strategic sectors». Such priorities included: cru-

cial raw materials, active pharmaceutical ingredients, lithium-ion batteries, clean hydrogen, semiconductors, cloud computing [9]. In 2022, photovoltaic panels and technologies, cybersecurity, and software were added to the list [9]. Among the EU countries, it is worth noting the following national development strategies: Alliance of Industries of the Future in France, Smart Industry in the Netherlands; Industry 2025 (Industrie 2025) in Switzerland [10].

IT companies can achieve and maintain leadership positions in the global market in several ways: by obtaining excess profits in the short term; by increasing sales and capitalization of companies, although this way is considered a riskier project due to the probable loss of stability of both competitive and market positions. The capitalization data of the world's largest companies are presented in *Tbl. 2* [1]. As can be seen from the ratings of the above-mentioned companies, IT companies enjoy the largest capitalization.

the manufacturing of products. Among developing countries, India accounts for the largest share [11]. This fact is evidenced by the widespread use of digital tools in the strategic management of companies in these countries (*Fig. 1*).

According to the World Intellectual Property Organization (WIPO) [12], artificial intelligence is currently becoming the fundamental technology of the IT sector. The volume of investments in the field of artificial intelligence around the world is growing rapidly. In 2018, it amounted to \$27 billion (of which 55% were US investments) [13]. According to the results of the PwC study «Artificial Intelligence: don't miss out», in 2030 global GDP will grow by 14%, or \$15.7 trillion, owing to the active use of artificial intelligence [14].

According to the World Intellectual Property Organization (WIPO) report «On trends in artificial intelligence», China is significantly ahead of other countries

Table 2

The largest world companies and their market capitalization [1]

| Company | Sphere of activities | Market capitalization, \$ billion |
|------------------------|---|-----------------------------------|
| Microsoft | Software | 905 |
| Apple Inc. | Electronics, information technology | 896 |
| Amazon Inc. | Retail company, selling and buying online | 875 |
| Alphabet Inc. (Google) | Internet services, video hosting, applications | 817 |
| Facebook | Internet, social network | 476 |
| Alibaba Group | Retail company, selling and buying online | 472 |
| Tencent | Technologies | 438 |
| JPMorgan Chase | Banking | 331 |
| Intel | Technologies | 241 |
| Samsung Electronics | Technologies | 234 |
| AT&T | Telecommunications | 228 |
| China Mobile | Telecommunications | 209 |
| Netflix | Supply of films and series | 173 |
| PayPal | Debit electronic payment system | 100 |
| XIAOMI | Manufacturing of electronics, information technologies | 54 |
| Ebay | Services in the sphere of online auctions and online stores | 37 |

IT services are a unique and most developed component of the global IT industry, that comprises the largest number of employees. According to the researchers of the Razumkov Center: «Over the past 10 years, global export services in the field of ICT and services carried out using digital technologies have been growing much faster than the entire export service as a whole, thus indicating the increased digitalization of the world economy. In 2018 the volume of export services provided using digital technologies reached \$2.9 trillion that accounted for about 50% of the world's export service» [11].

Countries belonging to the East Asian region (China, India) are advanced in the use of ICT technologies in

and metallurgical (MMC) and agro-industrial (AIC) complexes. In particular, almost a third of commodity exports were cereals and seeds. Their total share in commodity exports increased from 21.7% in 2021 to 29.2% in 2022» [18].

According to the research conducted in 2020, there was an imbalance between the development and realization of export-import potential by the regions of Ukraine [19]. Using the methods of modeling cluster analysis and canonical correlation, it was proved that the regions such as Dnipropetrovsk, Lviv, Kharkiv have the greatest export-import potential, followed by Vinnytsia, Zhytomyr, Ternopil, Sumy, Khmelnytskyi, Chernivtsi, Poltava. At

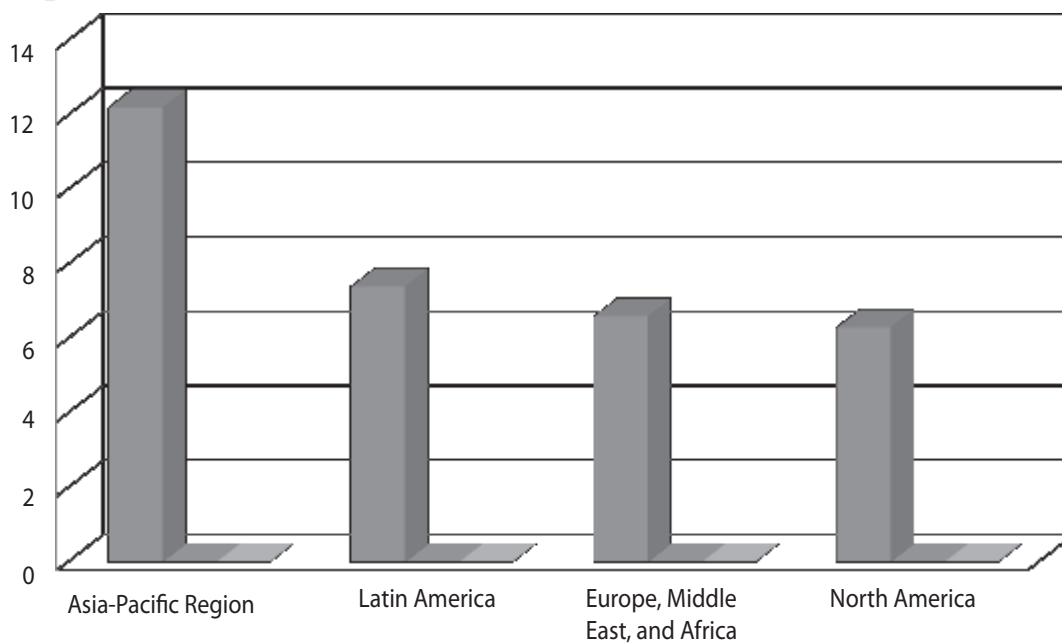


Fig. 1. The popularity of using digital tools in company management by geographic region [11]

in terms of innovative developments in artificial intelligence. Among the Top 20 academic organizations in the field of AI patenting, 17 are Chinese companies, as well as 10 of the Top 20 scientific publishers in the field of artificial intelligence are Chinese [12].

In terms of financial indicators, the total volume of the Chinese artificial intelligence technology industry by 2020 exceeded \$22 billion. By 2025, it should reach \$60.3 billion and hit Yuan 1 trillion (approximately \$150.8 billion) by 2030. This plan is interconnected with other strategic documents of China, representing the sixth priority among the 69 main tasks of the Central Government of China, defined in the «13th Five-Year Plan for the Development of National Strategic Industries and Developing Industries» (2016–2020) [1].

Among the most innovative companies in the world according to the Fast Company ranking in 2021 [15], the first two leading positions were taken by pharmaceutical companies (Moderna and Pfizer), that developed vaccines against COVID-19 (Tbl. 3). The third position was taken by Shopify, a company that develops software for online use and retail stores. In March 2019, Shopify became the second most popular e-commerce platform in the world in terms of the number of unique sites. In 2020, the company's revenue grew by 86%. In 2022, Shopify made a statement that it refuses to serve users from Russia because of the Russian military aggression on the territory of Ukraine [16].

The fourth position in the ranking was taken by SpaceX (aerospace industry), that concurrently is the provider of Starlink high-speed internet service. It's the first private company to send NASA astronauts to the International Space Station (the first US crew in the last 10 years).

It should be noted that the criteria for the leadership positions of the represented companies are, first of all, the active digitalization of all business processes, flexibility in strategic decision-making, stability of financial and economic status, the use of new organizational forms of strategic partnership, the introduction of innovative technologies, compliance with the principles of environmental friendliness and inclusiveness in business activities.

Among the most common digitalization trends that have gained strong market positions in certain segments are the creation of global digital platforms. In 2017, the total value of companies operating on the base of platforms with a market capitalization of more than \$100 million exceeded \$7 trillion, i. e., was 67% more than in 2015.

About 90% of the Internet search engine market is owned by Google. Facebook accounts for 2/3 of the global social media market, and its platform is the most popular social media platform in over 90% of the world countries. Nearly 40% of the world's online retail sales are made through Amazon's network, while its subsidiary, Amazon Web Service, accounts for roughly the same share of the global cloud infrastructure market [1].

In China, the WeChat communication network (owned by Tencent company) has more than a billion active users, and its payment system, together with the Alipay system (owned by Alibaba Group), covers almost the entire Chinese market for payments made through the cellular network. At this, Alibaba is estimated to account for almost 60% of the Chinese e-commerce market [1].

The rapid consolidation of the dominant position of the largest digital IT giants in the market is due to a number of factors. The first factor is related to the network effect – that is, the greater the number of users of the platform, the greater its value for everyone. The sec-

The top-ranked innovative companies in the world [15]

| Company by place in the ranking | Industry/market |
|---|---|
| 1. Moderna – a biotechnology company that develops vaccines and medicines. Known for development of an easily transportable vaccine against COVID-19 | Pharmaceuticals, biotechnology market |
| 2. Pfizer (in partnership with BioNTech) – the pharmaceutical company that developed the world's first vaccine against COVID-19 | Pharmaceuticals |
| 3. Shopify – the service that helped small stores to go online and work during quarantine. In 2020, the company's revenue increased by 86% | ICT technologies in the service industry |
| 4. SpaceX – space transport services company, also provider of Starlink high-speed internet service. The first private company to send NASA astronauts to the International Space Station (the first US crew in the last 10 years) | Aerospace, high-speed internet provider |
| 5. SpringHill Company – the film and series production company that promotes content with a message of social justice. In particular, the company works with artists who are ignored by the film industry | Entertainment industry based on the principles of social responsibility |
| 6. Epic Games – developer of mobile games in which there is an autonomous currency, own economy and culture. The company sees the future of social media not in traditional platforms, but in the gaming environment. One of the most famous games by the company is Fortnite | ICT technologies in the entertainment industry |
| 7. Netflix – the world's largest streaming service, with over 200 million subscribers. In particular, the company highlights the problems of black people and support them through their products, especially after the George Floyd protests. | ICT technologies in the service industry |
| 8. Tock – delivery service and pickup of orders from restaurants. The company started a platform that helped restaurants and coffee shops do business under quarantine conditions | ICT technologies in the restaurant business |
| 9. Microsoft – software and hardware development company, one of the largest corporations in the world. The company helped create an emergency and disaster response system | ICT technologies |
| 10. Graphika – a research company that, among other things, tracks fake information. Among other achievements, Graphika helped prevent russian influence on US elections and expose global disinformation related to COVID-19 | Consulting, analytics |

ond factor concerns the ability of platforms to extract, monitor, and analyze data. As in the case of the network effect, an increase in the number of users means an increase in the amount of data, which, in turn, allows you to overtake potential competitors and take advantages of the first mover. The third factor is that as the platform begins to scale up and offer various comprehensive services, the costs of users associated with switching to other service providers will begin to increase.

One of the most important tasks in the development of Ukrainian IT companies is the formation of digital infrastructure to support innovation activities. In the pre-war period (2016–2020), according to the State-controlled statistics, the total amount of expenditures on innovation activities decreased by UAH 1698.3 million, on research – by UAH 1657 million. It should be noted that the cost of innovation in the manufacture of chemical products (related to the high-tech industry) doubled (by UAH 508.5 million) for the period 2016–2018 and increased by three times for the period 2018–2020 (by UAH 1264.4 million). Growth was observed in the «manufacture of machinery and equip-

ment» and «computer programming and consulting» industries. The R&D sector increased spending in the production of basic pharmaceutical products and pharmaceutical preparations, also in the production of machinery and equipment. There has been a steady downward trend in spending on research and development, where the share of expenditures in GDP decreased from 0.75% to 0.41% over the ten-year period (2010–2020); over the same period, the share of spending on scientific and technical research in total decreased from 53.6% to 51.7% [17]. Thus, Ukrainian business spending on innovations did not become a priority, and the technical backwardness of domestic production was not a crucial problem. It should be noted that in terms of the number of innovatively active enterprises, characterizing the level of competitiveness of domestic business, and their share in the total number of enterprises, a significant reduction was observed in all industries during the pre-war period.

According to the National Institute for Strategic Studies: «With the beginning of the full-scale war on Ukraine, the problem of deepening the technological lag of the Ukrainian economy has worsened. In 2022, two-thirds of commodity exports were goods of the mining

the same time, modeling of causal dependencies between the development and use of export-import potential determined that the closest relationship was observed in the regions of Kharkiv, Dnipropetrovsk, Lviv, Poltava, Odesa, Zaporizhzhia. They were followed by Vinnytsia, Zhytomyr, Ternopil, Sumy, Khmelnytskyi, Chernivtsi, and Poltava. The largest causal dependencies were found between the number of employees at enterprises, labor force (working age), capital investments, expenditures on environmental protection and labor productivity in agricultural enterprises, net profit (loss) of both large and medium-sized enterprises, and volumes of foreign trade in goods. Thus, a high level of management of export-import potential was observed in Dnipropetrovsk, Lviv, and Kharkiv regions [19].

Experts believe that «the weakest point in the digitalization of Ukraine's economy is the lack of large IT companies of Ukrainian origin. Almost all major Ukrainian companies in this industry operate in the internal market of the country» [1]. For the period of 2023, among

the largest companies in the IT sector of Ukraine [20], the top ten included two IT companies of Ukrainian origin (*Tbl. 4*), with 48% of revenue coming from the TOP-5 of these companies.

Despite the negative forecasts for the development of the IT industry due to the events of the Russian military invasion in 2022, the industry was the only one that managed to increase exports in 2022. However, the positive dynamics of the development of the information technology sector forms a «false impression of the real state of affairs» [21]. According to the NBU, in 2022, the IT industry provided foreign exchange earnings to the Ukrainian economy of \$7.34 billion. The volume of exports increased by \$400 million, i. e., 5.8% compared to the pre-war year of 2021. This result is considered positive, given that the indicators of many other export-oriented industries consist only of negative numbers.

A positive fact is the increase in the number of IT specialists in Ukraine up to 300 000 persons [21]. How-

Table 4

Ranking of the largest domestic companies in the IT sector for 2023

| IT company | Characteristics |
|--|---|
| EPAM Systems | Operating in Ukraine since 2005. As of the beginning of 2023, 114 000 persons employed. Revenues for 2022 amounted to \$4.82 billion, or 28.4% more than in 2021 |
| GlobalLogic (part of the global holding company Hitachi Group) | The third largest company in Ukraine. Approximately 7 000 workers. Revenue: UAH 11.5 billion. 10 mini-offices for relocated employees have been opened. In 2023, the company distinguished itself in the global market by purchasing other software firms. In particular, the Latin American company Hexacta and the Romanian Fortech were acquired |
| Luxoft | The company was founded in Russia, and later the company was bought by the American company DXC Technology. 3 800 employees work in Ukraine. 5 more offices were opened. Revenue: UAH 5.9 billion. Since April 2022, DXC Technology has withdrawn from the Russian market |
| Ciklum | Almost 2 800 employees. Revenue: UAH 4.8 billion. Donated UAH 42 million in support of the Armed Forces of Ukraine. The company opened development centers in Bulgaria and Romania |
| Intellias | The Ukrainian IT company founded in the city of Lviv. More than 3 000 employees: the best employer among large IT companies according to a DOU survey. Revenue: UAH 4 billion. In 2022 has acquired the British IT company Digitally Inspired |
| Infopulse Ukraine | The company was founded in 1991 in the city of Kyiv. More than 2 000 employees. Revenue: UAH 3.3 billion. The clientele includes Bosch, British American Tobacco, VEON, Vodafone Ukraine, OTP Bank |
| Capgemini Engineering (ex. Lohika Ltd) | Until 2016, Lohika was a private company, then became part of the French company Altran Technologies. In 2020 was acquired by another French company, now operating under the name Capgemini Engineering. Almost 1 500 specialists employed. Revenue: 3 billion UAH |
| Playtika | An Israeli digital entertainment company specializing in the development and publication of mobile games. The Ukrainian division employs almost 850 specialists. In 2022, it was planned to lay off almost 800 employees around the world, including 100 people among Ukrainian staff. The reason is a threefold drop in the price per share on the NASDAQ exchange. Revenue: UAH 2.4 billion |
| Sigma Software | A Swedish-Ukrainian company. Employs almost 1 900 persons. Before the full-scale invasion, they opened offices in Uzbekistan, Chernivtsi, and Lutsk. Within six months, 7 offices in Europe (Portugal, Poland, Germany, Czech Republic). Revenue: UAH 2 billion. |
| Playtech | An Israeli company that develops software for gambling, online casinos, online poker rooms, sports betting, and live dealer games. Revenue \$1.5 billion. In 2020, the income of the Ukrainian representative office amounted to UAH 883 million, with UAH 22 million net profit |

Source: developed from the [20].

ever, it should be noted that during 2015–2021, exports of computer services grew by an average of 26.8% annually. Consequently, there is now a significant slowdown in the growth rate of the IT industry. In total, in 2022, Ukrainian IT companies provided the State with about 44% of all exports of services. However, already in January 2023, profits from IT services decreased significantly and brought in \$223 million less than in December of the last year [21].

«According to pessimistic forecasts, in 2023 the information technology sector will not show growth at all or even decline. Under such conditions, there is a risk of breaking the trends that have persisted in the Ukrainian IT sector for more than two decades. However, a more positive scenario is also being considered: predicting about 6% of the industry's growth» [21]. However, experts note that there are large risks regarding the continuation of the war.

Among the biggest risks to the survival and development of the IT industry, practitioners bring out: a decrease in the number of foreign customers in the domestic market due to hostilities; global trend of job cuts in global IT companies. This is confirmed by the reduction of vacancies (almost halved over the year), while the number of those wishing to work has almost doubled in the opposite progression. Such circumstances prove that «the candidate's market is now becoming the employer's market, and the supply significantly exceeds the demand. In general, the hiring of IT staff in 2022 decreased by 13%, as a result of which juniors – beginners with little or no experience – suffer the most. The number of vacancies they can apply for has decreased by 70% over the past year, and competition has more than tripled» [21]. Experts attribute this to the US IT labor market, where there have been significant layoffs in IT companies. Moreover, some American companies used outsourcing in Ukraine. At present, global companies remain in a state of expectation of a recession, which requires them to slow down development processes and save money.

The problem for Ukrainian IT companies was the reservation of their own specialists and the restrictions on crossing the border. This jeopardizes the fulfillment of guarantees for foreign customers and partners. «At this, the current legislation does not provide for the possibility of reserving sole proprietors, the mechanism works exclusively for full-time employees. In addition, there is still the question of the possibility of using this mechanism for medium and small businesses and startups (with up to 250 employees). Because, according to the IT Research Resilience study, 88% of IT specialists in Ukraine work as individual entrepreneurs, and almost every second one – for small companies» [21].

The efficiency of communications with Western partners fails, because business trips of IT specialists abroad, their participation in symposia, exhibitions, and conferences has become a certain problem. In such circumstances, the efficiency of creating a regulatory frame-

work for the implementation of the aforementioned processes is of paramount importance.

Along with these events occurs the formation of the industry's potential and the main positive factor is the allocation and implementation of the military-tech direction through innovative developments and startups. The State support in this area in the form of financing creates a priority for the production of dual-use goods that will be used in the fields of defense, cybersecurity, medicine, restoration and reconstruction of infrastructure, and sphere of education. According to the Ministry of Digital Transformation, in 2022, projects totaling UAH 47.4 million were financed and the financing of projects under the dual-use program currently amounts to UAH 28 million. At this, applications are accepted on an ongoing basis, the key industries are cybersecurity, healthcare, education, defense, and infrastructure reconstruction. Thus, the Fund continues to issue grants for military-tech and finances concluded contracts under previous programs [21].

According to the plans of the same ministry, it is planned to launch a project to create an appropriate cluster on the basis of the Innovation Development Fund, which will integrate scientific and technical developments, create digitalization opportunities for the development of the military-industrial complex, attract venture capital investments for the implementation of startups, intensify cooperation with the country's leading universities in the selection of talents among students and scientists.

CONCLUSIONS

The results of the analysis of the development of IT companies in the wartime and regarding the post-war conditions made it possible to determine their following features: a decrease in the number of foreign customers in the domestic market due to ongoing hostilities; the global trend of job cuts in global IT companies, which negatively affects the domestic labor market; the need to relocate domestic IT business abroad due to hostilities in the country; reduction of the venture capital investor market for start-up investment; decrease in the efficiency of communications with Western partners, regulatory and legal support for the departure of IT specialists on business trips abroad, their participation in symposia, exhibitions, conferences.

The formation of the potential of the IT industry goes through the allocation and implementation of the military-tech direction through innovative developments and startups. The State support in this area is carried out as follows: financing creates a priority for the production of dual-use goods that will be used in the fields of defense, cybersecurity, medicine, restoration and reconstruction of infrastructure, sphere of education; creation of a cluster on the basis of the Innovation Development Fund, that will integrate scientific and technical developments, expand digitalization opportunities for the development

of the military-industrial complex, attract venture capital investments for the implementation of startups, intensify cooperation with the country's leading universities in the selection of talents among students and scientists. ■

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