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RESEARCH OF IT BUSINESS IN UKRAINE: TRENDS, FORECASTS, AND DEVELOPMENT STRATEGIES

ABSTRACT

The study of the development of the IT industry is key for the formation of strategic decisions of government bodies and businesses aimed at creating a competitive and innovative economy, as well as for forecasting the opportunities and challenges that await this industry in the future. The purpose of the work is to analyze trends in the IT industry in Ukraine and forecast the dynamics of development of key indicators of its development, as well as to offer a scientific approach to the formation of development strategies for IT companies based on strategic analysis.

The article provides a detailed analysis and review of modern trends in the development of the IT industry in Ukraine. The authors investigated the key factors and challenges affecting the dynamics of this sector in the country and determined competitive advantages and potential limitations for its development, respectively. The forecast of the volume of IT exports from Ukraine as a key indicator of the development of the IT industry for the coming years is also presented, which is based on the analysis of current data and trends in the development of the industry, taking into account the year of full-scale war, which allows us to give an objective perspective on the possibilities of growth and development of IT -sector in Ukraine. The analyzed actual and forecast data give reasons to consider the IT industry promising for the further development of the economy of our country.

The article focuses on the importance of using strategic analysis for the development of IT companies, in particular, in terms of developing strategies for the development of IT companies, it is recommended to use two main tools - SWOT analysis and PEST analysis. The authors have developed a matrix of alternative strategies for the development of an IT company depending on its position in the context of the presence of internal strengths and weaknesses and existing opportunities and threats from the outside. This approach allows companies to more objectively assess their opportunities, understand threats and make effective strategic decisions aimed at success and stable development in a rapidly changing environment.

Keywords: IT business, IT export, IT companies, IT specialists, forecasting, SWOT-analysis, PEST-analysis, strategic analysis, development strategies

JEL Classification: F19, L10, L86, C53

INTRODUCTION

The beginning of 2022 proved to be a turning point for Ukraine as a state and its economy. The war initiated by russia in Ukraine brought numerous challenges and trials for Ukrainian businesses; however, even in such dire circumstances, the IT industry continues to operate successfully, showcasing its remarkable resilience.

The IT industry stands as one of the few export sectors in Ukraine that remains fully functional during wartime and contributes significantly to the state budget. These achievements became possible through effective business continuity plans, timely relocation of teams, and diversification of development centers both within Ukraine and abroad.

IT companies persist in executing projects successfully, notwithstanding blackouts, while promptly fulfilling tax obligations, expanding their presence in the global market, and attracting new clients. The combination of these factors, along with governmental support, lays the groundwork for the further development of the Ukrainian IT sector, which has the potential to become a driving force for the country's reconstruction after the war's conclusion.

The IT market represents one of the most dynamic and promising sectors in Ukraine and worldwide. Its volumes experience an average annual growth rate of 20%, with computer services occupying an increasingly significant share in the service structure. Ukraine possesses considerable human potential to establish itself among the leaders in the IT market. Moreover, the government creates conditions conducive to the industry's development through tax incentives and special legal regimes.

All the aforementioned facts necessitate research on IT market trends, and developmental forecasts, and high-light the importance of scientific investigations in shaping strategies for IT companies, considering both external and internal factors.

LITERATURE REVIEW

The field of Information Technology (IT) has become a top subject of interest among researchers due to its significant impact on all sectors of the economy and its rapid development. In the work by Zhuravlyov, O. V., and Simachev, O. A. (2018), a comprehensive analysis of the IT market's current state was conducted, while Dovgan, L. E., and Malik, I. P. (2017) examined the development of the labor market and major trends in the Ukrainian IT industry.

Sheiko I. and Storozhenko O. (2019) provided a detailed and concrete analysis of the Ukrainian IT sector, determining its perspectives in the context of the global digitalization process and identifying directions for strengthening its position.

Melnyk T., and Zavhorodnya E. (2022) researched the specifics of the IT sector's functioning and its importance in the Ukrainian economy before and during full-scale military operations. The authors identified the problems caused by the war, the impact of the war on the IT labor market, and proposed solutions.

Conceptual foundations of the IT sector and its various aspects were highlighted in the works of Oleksenko, Y., and Makarenko, S. (2020). Additionally, researchers analyze problematic aspects of IT service market development, such as insufficiently skilled workforce (Dovgan, L. E., and Malik, I. P. (2017); Goncharenko, T. E. (2017)), inadequate government regulation (Vasiltsev, T. G., Lupak, R. L., and Shtets, T. F. (2018), and intellectual property protection (Tymoshenko, N. Yu., and Ronsky, B. Yu. (2020)). The issues of excessive IT professionals' migration, IT service outsourcing, and low internal demand for IT products were discussed in scientific works by Tymoshenko, N. Yu., and Ronsky, B. Yu. (2020).

In the research conducted by Li Guo, Chao-Lu Wu, and Li Guo (2016), factors influencing the brain drain of IT professionals were identified using the Analytic Hierarchy Process (AHP) method. The factors were categorized into "personal factor," "cooperation factor," and "social factor." Among these factors, the corporate factor was identified as the most influential, followed by the social factor, while the personal factor had the least impact.

In authoritative foreign publications, researchers often explore the development of information technologies through the lens of their impact on various fields, including business processes (Mohsen Attaran (2004), Kuznyetsova, A., Kozmuk, N. and Levchenko, O. (2017), Shteingauz, D., Kuznyetsova, A., & Achimovich, D. (2021)), management (Peter J. Sher, and Vivid C. Lee (2004)), the tourism industry (Zheng Xiang, Vincent P. Magnini, and Daniel R. Fesenmaier (2015)), medicine (Ashish K. Jha, et al. (2008); Mohd Javaid, et al. (2020)), and more. Studies on the peculiarities of IT development based on cultural values and national mentality are also intriguing. For instance, Said S. Al-Gahtani, Geoffrey S. Hubona, and Jijie Wang (2007) compare the development and adoption of IT in Saudi Arabia and North America.

Numerous works are dedicated to the methodology of strategic analysis, particularly SWOT and PEST analyses. For instance: Charis V. (2019), Benzaghta, M. A. et.al (2021), Sarsby, A. (2016), Gurl, E. (2017), Verboncu, I., and Condurache, A. (2016), Kuznyetsova, A., Klipkova, O., & Maslov, V. (2022), Rudnicki, W., and Vagner, I. (2014).

AIMS AND OBJECTIVES

The aim of this article is to conduct an analysis of existing trends and forecast indicators for the development of the IT market in Ukraine, conduct an in-depth study of the influencing factors on the further growth of the IT industry, and develop a scientific approach to formulating the strategy for IT companies' development, considering a combination of external and internal factors.

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METHODS

The article utilizes FORECAST.ETS function in Microsoft Excel, which is based on Exponential Smoothing State Space (ETS) algorithms. This function enables forecasting based on historical data using exponential smoothing methods to determine weighted average values.

The main idea of exponential smoothing is to give more weight to recent values than those from the distant past. Smoothing coefficients are used to control the rate at which the weight decreases over time. Selecting optimal coefficients allows adapting the method to different types of time series based on their characteristics. This method is well-suited for forecasting time series with slight or moderate trends and seasonal variations, as well as for data with noise or fluctuations. Due to these characteristics, we chose the FORECAST.ETS function for our forecasting purposes.

The syntax of the function is as follows: FORECAST.ETS (target_date, known_y, known_x, [seasonality], [data_completion], [aggregation]).

For the analysis of factors influencing the development of the IT business in Ukraine and the formulation of alternative development strategies for IT companies, strategic analysis tools such as SWOT and PEST analyses were applied. These tools are used to evaluate the company's internal situation and its external environment. They help identify internal strengths and weaknesses and external opportunities and threats.

SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) defines four key aspects: strengths, weaknesses, opportunities, and threats.

PEST analysis (Political, Economic, Social, Technological) considers external factors that may impact the business or organization from a political, economic, social, and technological perspective.

RESULTS

One of the most striking indicators of the IT industry's development, even during times of war, is the volume of IT product exports. The share of IT exports in the country's overall export and GDP has been consistently increasing each year. Over the past 10 years, the share of computer service exports in GDP has risen from 1.8% to 5.27%, and in service exports, it has grown from 9.08% to 80.19% (Figure 1). Thus, even in the conditions of war, IT companies have played a significant role in contributing to the major share of service exports from Ukraine.

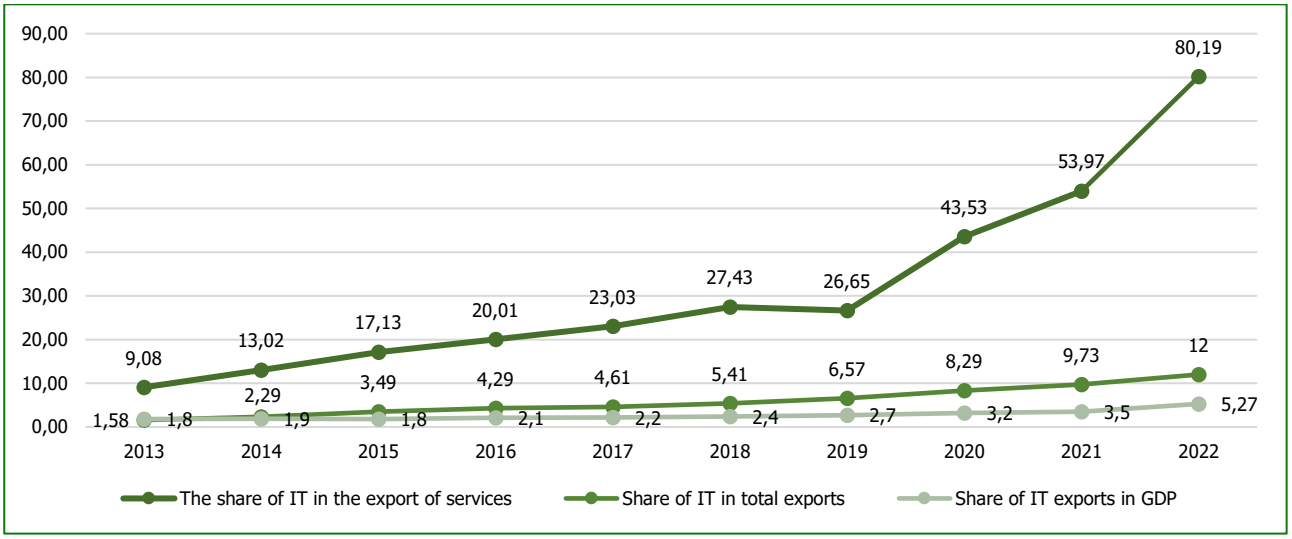

Figure 1. The share of IT products in GDP and in total exports, %. *(Source: calculated by the authors according to the data of the State Statistics Service of Ukraine (2022))*

In Figure 2 the dynamics of export and import of computer services during 2013-2022 are presented.

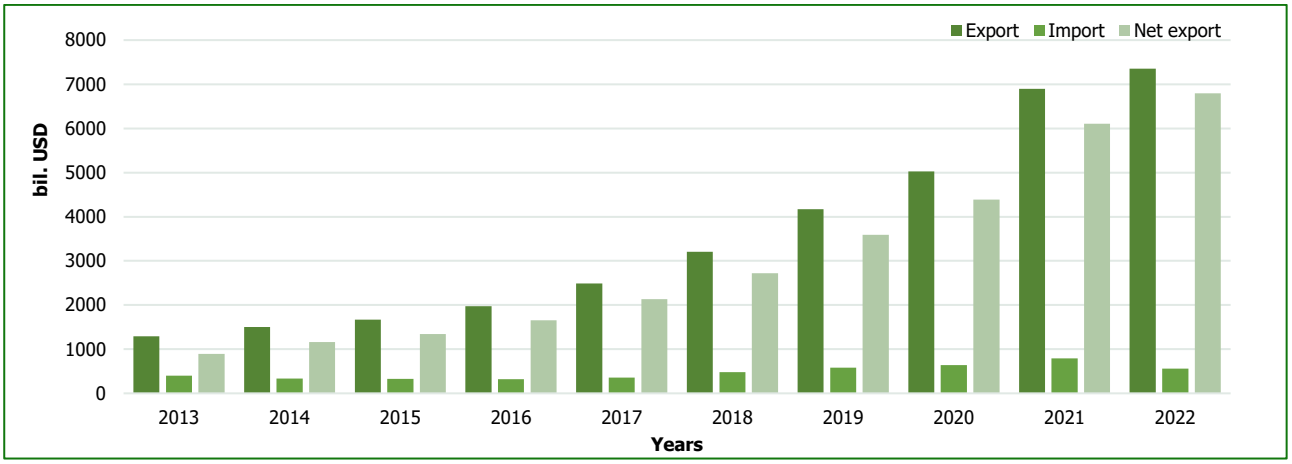

Figure 2. Dynamics of export and import of IT services. *(Source: created by the authors according to the data of the State Statistics Service of Ukraine (2022))*

Throughout the analyzed period, IT exports have demonstrated a consistently positive and growing trend. Starting from 2018, there has been a rapid increase in the export volumes of computer services from Ukraine, reaching record highs in 2021 and 2022. In 2021, IT exports reached USD 6.9 billion USD, showing a remarkable 37.29% growth compared to the previous year. Despite the ongoing war, the IT export continued to grow in 2022, amounting to USD 7.35 billion.

In contrast, the indicators for the import of computer services into Ukraine remain relatively insignificant in comparison to exports and display relatively stable dynamics. Thus, the net export of IT products is substantial and shows a tendency to grow. This signifies that Ukraine's IT industry competes successfully in foreign markets, and there is an increasing demand for domestic IT products.

From 2014 to 2022, the growth rates of IT product exports significantly outpaced the growth rates of service exports and overall exports. While the country's export, including service exports, experienced negative growth rates in 2014-2016 and in 2020 and 2022, the IT export maintained a positive growth trajectory. In the last year of the analyzed period, 2022, the export of goods decreased by 35%, amounting to USD 44.2 billion, while the export of IT services grew by 6%, almost doubling the absolute figures for goods exports (Figure 3).

These trends illustrate the resilience and competitiveness of Ukraine's IT sector in the global arena, demonstrating its crucial contribution to the country's economic performance amidst challenging circumstances.

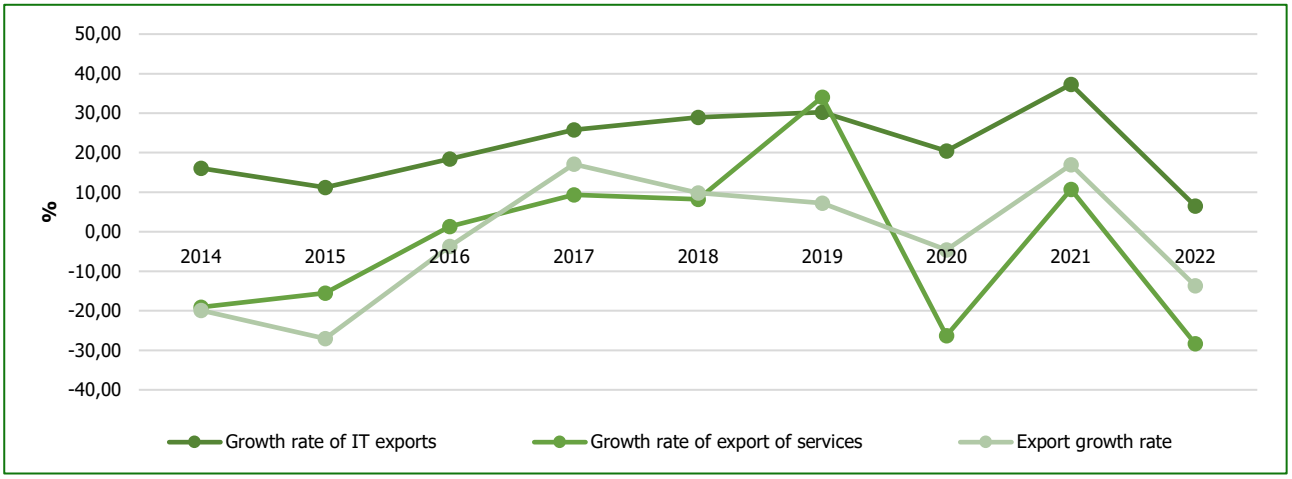

Figure 3. Export growth rates in Ukraine. *(Source: calculated by the authors according to the data of the State Statistics Service of Ukraine (2022))*

In 2021, among the ten largest partners for Ukraine's export of computer services were the United States, the United Kingdom, Malta, Israel, Cyprus, Switzerland, Germany, the Netherlands, Estonia, and Canada. Collectively, these countries accounted for nearly 80% of Ukraine's IT exports, with the United States being the most significant partner, receiving 40% of Ukraine's IT product exports (Figure 4). The substantial share of IT exports to these countries highlights the strategic importance of these markets for Ukraine's IT industry.

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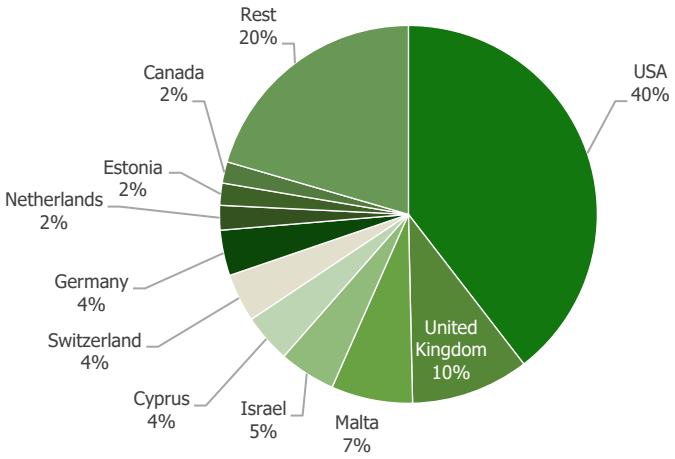

Figure 4. TOP-10 partners of Ukraine for the export of IT services in 2021. *(Source: created by the authors according to a report of IT Ukraine Association (2022))*

Approximately 19% of IT services exports are accounted for by the TOP-5 IT companies in Ukraine, namely EPAM Ukraine, SoftServe, GlobalLogic Ukraine, Ciklum, and Intellias (Table 1).

Table 1. The share of the largest TOP-5 companies in IT exports for 2022. *(Source: calculated and created by the authors according to a report of IT Ukraine Association (2022))*

TOP-5 IT companies	Export of IT services, USD million	Share in IT exports, %
EPAM Ukraine	600	8.16
SoftServe	150	2.04
GlobalLogic Ukraine	356	4.84
Ciklum	148	2.01
Intellias	126	1.71
Total	1380	18.78

The presented data on the market share of the largest IT service exporters in Ukraine indicates the absence of a monopoly in this industry. The highest share in IT exports belongs to EPAM Ukraine, accounting for just over 8%. GlobalLogic Ukraine also holds a significant share of nearly 5%, while the remaining companies each occupy 2% or less of the market (Figure 5). This distribution points to a competitive landscape with no single dominant player in the IT services export market in Ukraine.

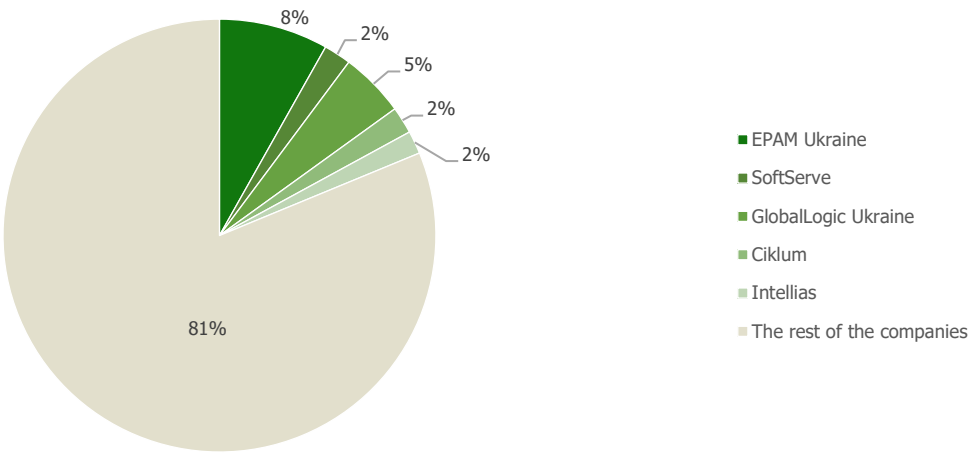

Figure 5. The share of the top 5 companies in IT exports. *(Source: calculated and created by the authors according to a report of IT Ukraine Association (2022))*

As of 2021, the number of active IT companies in the Ukrainian market had been steadily increasing over the years. According to data from the State Statistics Service of Ukraine, the number of legal entities in the IT sector grew from 6.3 thousand in 2017 to 8.8 thousand in 2021. However, based on an expert assessment by the IT Ukraine Association and dou.ua, the actual count of active companies by the end of 2021 was around 5 thousand, indicating a discrepancy between registered entities and truly operational companies.

Following a comprehensive invasion, the market experienced a decline, and by the end of 2022, only 2 thousand companies remained active in the labor market, as reported by experts (Figure 6.). Despite this contraction, the IT industry demonstrated positive development indicators concerning the products and services produced.

Overall, the global IT market is growing rapidly and evolving, and Ukraine has found its niche in this market due to the dynamic growth of its own IT sector. Specifically, Ukraine has established itself as a significant labor market compared to its closest competitor countries.

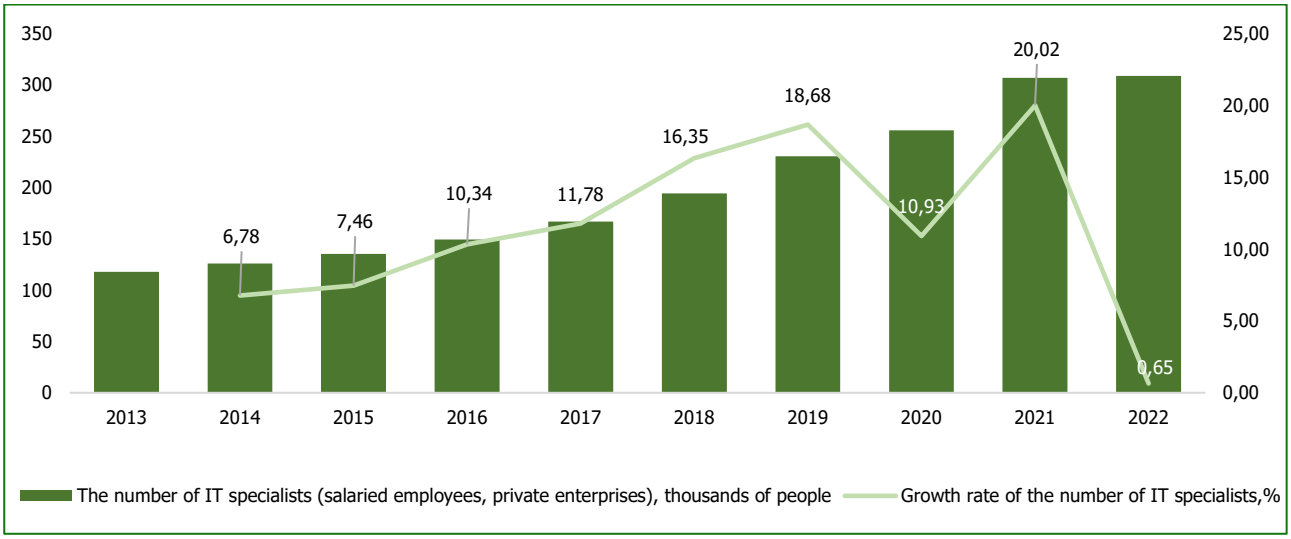

Figure 6. The number of IT specialists in Ukraine. *(Source: calculated and created by the authors according to a report of IT Ukraine Association (2022))*

The number of IT specialists in Ukraine has been steadily increasing over the years. In 2013, there were 118,000 individuals employed in the IT industry, while in 2022, this number grew to 309,000, nearly tripling in size. According to experts in the IT sector, there is an annual demand for 25,000 specialists (graduates). However, the higher education system in Ukraine produces approximately 16-17 thousand IT specialists per year, creating a gap in the labor market. As a result, informal education in the form of IT schools, courses, academies, and corporate IT programs has been actively developing, preparing approximately 10-12 thousand new IT specialists annually (Do IT Like Ukraine (2022)).

It's worth noting that official education in Ukraine is currently unable to meet all the demands of the IT industry, with the majority of professionals requiring additional training. IT schools and various courses bridge this gap. The problem lies in the fact that educational programs in higher institutions do not always align with the real needs of the industry and are not updated in a timely manner. There is also a shortage of instructors with the necessary skills and an insufficient number of practical assignments in the educational process. Consequently, over 50% of IT workers possess additional education beyond their formal higher education, and 20-30% of IT specialists do not hold a higher education degree at all.

When considering the quality of IT specialists, certain negative trends can be observed. In Ukraine, the majority of IT workers are at the Junior level (0-2 years of work experience) and Middle level (3-10 years of experience), with only a small portion at the Senior level, boasting over 10 years of experience. The percentage breakdown of IT professionals at different levels is as follows:

- junior – 38%;
- middle – 48%;
- senior – 14%.

For comparison, in developed countries, the distribution of IT specialists is as follows:

- junior – 13%;

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- middle – 53%;
- senior – 34%.

These data indicate that the IT industry in Ukraine is still in its early stages of active development. The abundance of human resources, cost-effective labor, and government support make it an attractive market, despite the ongoing war in the country.

Taking into account the positive dynamics of the development of the labor market in the IT sector of its potential, the demonstrated stability of this field during the war, we offer a forecast for the further development of the IT industry, in particular in terms of its export potential.

In general, the forecasted indicators for IT export volumes until 2025 show growth across all scenarios (Figure 7).

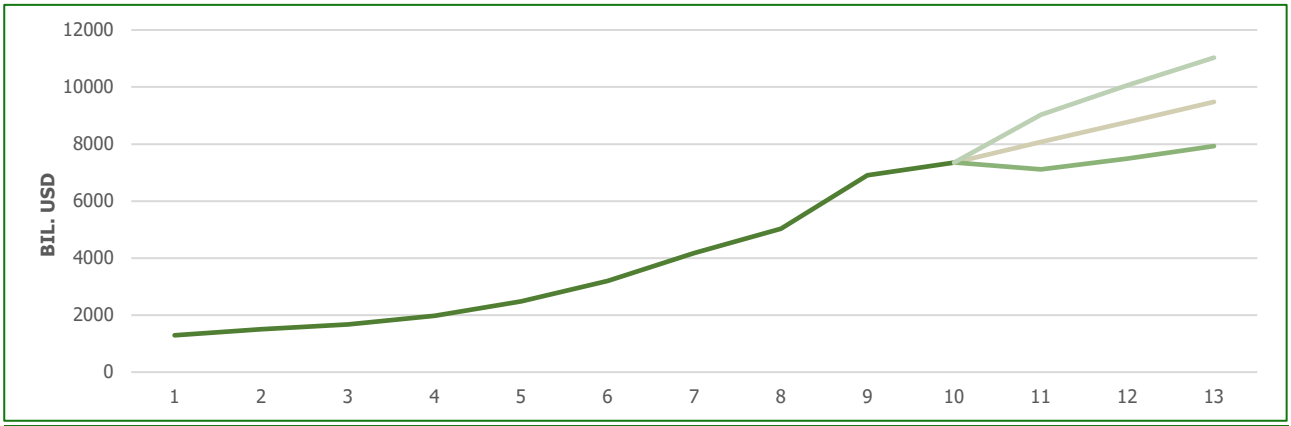

Figure 7. IT export forecast. *(Source: calculated and created by the authors according to the data of the State Statistics Service of Ukraine (2022))*

The baseline scenario predicts an average annual increase of 8.85%, the optimistic scenario forecasts a growth rate of 14.64% per year, and the pessimistic scenario projects a more modest growth of 2.64% per year (Table 2).

Table 2. Growth rates of IT exports according to forecast data.

Years	Base forecast, %	Pessimistic forecast, %	Optimistic forecast, %
2023	9.78	-3.25	22.81
2024	8.74	5.26	11.48
2025	8.04	5.91	9.62
Average growth rate for 2023-2025	**8.85**	**2.64**	**14.64**

By the end of 2025, according to the baseline scenario, the export volume of IT services is projected to reach approximately USD 9.5 billion. In the optimistic scenario, the export volume is expected to exceed 11 billion US dollars, while the pessimistic scenario forecasts a figure close to USD 8 billion.

This forecast holds particular significance as it considers the challenges faced by the IT industry in the context of a war year and martial law. Notably, the forecasts made within the framework of the IT Ukraine Association's annual study in 2021, before the onset of the war, were considerably more optimistic.

Indeed, the deviations of actual data from the forecast for 2022 in various scenarios of IT export development are as follows:

- base scenario: Deviation -4.55%;
- optimistic scenario: Deviation -12.5%;
- pessimistic scenario: Deviation -11.45%.

Despite the challenges posed by the war, the IT industry in Ukraine has maintained its position as a robust tax contributor to the country (Figure 8). Notably, even during the war, IT companies continued to contribute to the state budget, with some entities making advance tax payments to support the national economy. This underscores the resilience and commitment of the IT sector to sustaining economic growth in Ukraine during difficult times.

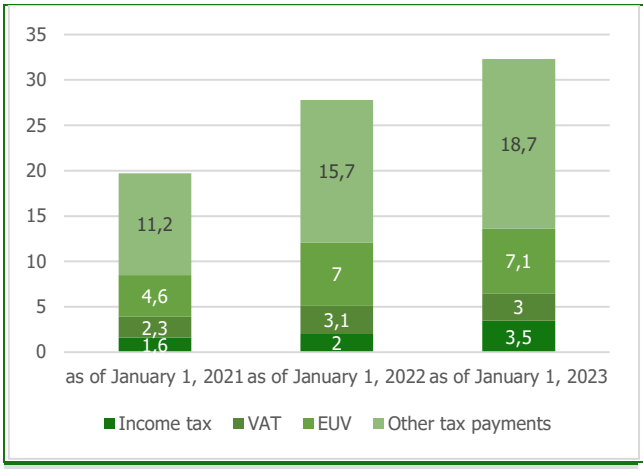

Figure 8. The amount of taxes paid for IT activities, billion UAH. *(Source: created by the authors according to a report of IT Ukraine Association (2022))*

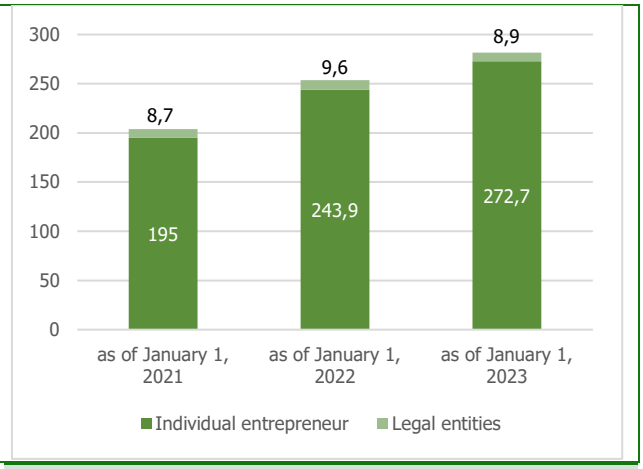

Figure 9. The number of taxpayers engaged in IT activities, thousands. *(Source: created by the authors according to the data of the State Statistics Service of Ukraine (2022))*

As we can see, despite the incentives introduced by the government at the beginning of the war, the IT industry continued to operate successfully and pay taxes in full.

Overall, the dynamics of the external and internal environment of the IT sector demand adaptability in the strategies of its functioning, depending on the circumstances. Effective development strategies can be achieved through an objective and comprehensive evaluation of the business environment for individual companies and the sector as a whole. Analyzing the development of the IT sector and individual companies within this sphere using the tools of strategic analysis is particularly relevant. Next, we will analyze the main influencing factors on IT sector companies based on a combination of SWOT and PEST analysis (Table 3).

Table 3. Strengths and Weaknesses of IT sector companies (SW – company analysis). *(Source: developed by the authors based on Verboncu, I., and Condurache, A. (2016), Gurl, E. (2017), Charis V. (2019), Karyono, O., and Agustina, K. (2019), Benzaghta, M. (2021))*

Potential Advantages - Strengths of the Company This refers to internal positive aspects of an organization's operations or advantages that facilitate the achievement of its objectives.	**Potential Drawbacks - Weaknesses of the Company** These are internal positive aspects that enable the attainment of competitive advantages.
1. High quality and efficiency of company management (financial, personnel, technological, and informational). 2. Sufficient internal financial resources for project implementation, and stable financial condition. 3. Favorable stage of the enterprise's life cycle for active development. 4. Presence of a strong motivational foundation for employee development, and well-established communication within the company. 5. Business creativity and innovativeness, uniqueness of the offered products. 6. Presence of a well-developed corporate culture that enhances the company's image in the market. 7. Possession of a powerful brand, market recognition of the company; scalability, and global presence in the market. 8. Effective organization of internal corporate processes, and well-coordinated coordination of structural units.	1. Unqualified management in finance, personnel, technology, and information systems, along with the presence of conflicts within the company. 2. Unstable financial condition and a lack of internal financial resources for project implementation. 3. Company operating in a life cycle stage that limits its functioning capabilities. 4. Absence or low incentives for employee development, talent outflow from the company, and unsatisfactory communication. 5. Insufficient support for employee creativity and an imperfect innovation process. 6. Lack of a proper corporate culture, which may affect productivity and employee satisfaction. 7. Unknown brand presence; inflexibility and inability to scale the business. 8. Imperfections in the organization of internal processes and inadequate coordination between departments/divisions of the company.

Management should influence the internal environment of an IT company in the direction of supporting and strengthening its strengths while mitigating its weaknesses.

Regarding the external environment, the company should evaluate threats and opportunities in the context of a wide range of factors, including conducting a PEST analysis. Accordingly, opportunities and threats in the external environment of the IT company will be assessed from the perspective of political, economic, social, and technological factors (Table 4).

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Table 4. PEST / OT - analysis of the IT company's operating environment. *(Source: developed by the authors based on Ho, J. K. K. (2014), Cox, J. (2021))*

External Environment Opportunities These are external positive factors or circumstances that can create new prospects or advantages for the subject of analysis.	**External Environment Threats** These are external negative factors or risks that can impact the subject of analysis and its success.
Political Factors	
1. Stability of the political/military situation in the country and the world. 2. Liberal and clear legislation, a favorable political climate for business development, digitalization of the economy, venture business, and support for the start-up culture. 3. Favorable government regulation of IT business functioning and its initiation. 4. Adequate level of legal protection for the financial interests of IT sector representatives, transparency, and promptness in resolving legal disputes; protection of intellectual property rights. 5. Favorable policies for the functioning of the information space concerning internet access to information, protection of user data privacy, internet freedom, and absence of censorship. 6. Support for the development of e-governance, expansion of digital service provision, and the development of digital infrastructure.	1. Unpredictability of political/military changes at the national and international levels. 2. Complexity of legislative norms, their variability, incompleteness, and contradictions regulating the functioning of the IT sector. 3. Insufficient or overly complex regulation of the IT sector, including burdensome rules, lack of transparency, and complicated procedures for project initiation and implementation. 4. Absence of legislation regarding the legal protection of financial interests of IT businesses, ineffective protection of intellectual property, corruption, and subjectivity within the judicial system. 5. Censorship and restrictions on freedom of speech, lack of data privacy protection for citizens, access limitations to information, and control over communications and the internet. 6. Low level of digitization of public services and inadequate infrastructure.
Economic factors	
1. Favorable phase of the business cycle in the global economy for the development of the IT sector. 2. Stable and predictable international/national market conditions for IT services; stability and expansion of the existing client base; increased global demand for IT products. 3. Investments in digital infrastructure and a favorable investment climate in the country of business operation. 4. Stable fiscal policy, particularly regarding taxation in the IT sector; preferential taxation for IT companies. 5. High level of economic freedom and free competition in the industry. 6. Sufficient internal financial resources to support the implementation of IT companies' projects. 7. Unrestricted access to bank loan resources and resources from the stock market as needed, with sufficient volume and accessibility in terms of cost. 8. Stable currency policy of the country (relevant for service exporters/importers). 9. State participation in economic globalization processes; the existence of bilateral agreements with other countries regarding investments, cooperation, and avoidance of double taxation for representatives of the IT sector; export orientation of the IT sector.	1. Decreased business activity in the IT sector due to the global economy entering a downturn phase. 2. Unfavorable international/national market conditions for IT services; decline in global demand and reduction of the client base. 3. Unfavorable investment climate in the country/lack of investments in the development of industry infrastructure. 4. Burdensome taxation regime for the IT sector, complex tax administration. 5. Insufficient level of economic freedom for business entities; restrictions on free competition or, conversely, powerful competition in the industry. 6. Limited internal financial resources of companies. 7. Underdeveloped banking sector and the stock market, resulting in restricted access to external financing. 8. Unpredictable and unstable currency policy of the country and currency fluctuations. 9. Economic isolation of the country, lack of cooperation with other states concerning investments, taxation, and other essential aspects of the IT sector's functioning.
Social Factors	
1. Improvement of the quality of IT education and regulation of talent migration; labor mobility in the IT sector (provided other favorable factors for attracting skilled workforce). 2. Increasing interest in technology in society and raising digital and information literacy across different segments of society. 3. Positive demographic trends; improvement in the age structure of the population. 4. Positive changes in societal consumption habits: growing interest in social media and an increasing number of active users of mobile devices and digital technologies in general. 5. Internet safety for citizens. 6. High level of trust and adherence to ethical business practices in the IT sector. 7. Equal access to digital resources and the proliferation of remote work and learning practices.	1. Instability and low quality of education for IT workforce, restrictions on labor mobility and worker migration (brain drain of talented youth abroad). 2. Insufficient education among the general population, lack of computer and information literacy, and citizen inclusion. 3. Aging population. 4. Lack of societal interest in digital technologies, and critical attitudes towards innovations in society. 5. Cybercrime and internet fraud; potential violations of privacy and confidentiality. 6. Frequent violations of ethical business conduct, and mistrust among economic entities. 7. Inequality in access to technologies and digital resources based on socio-economic disparities. 8. Possible negative transformations in the labor market context due to excessive development of innovative digital technologies.
Technological Factors	
1. Constant improvement in the quality and availability of internet connectivity and the development of mobile technologies and network coverage. 2. High-quality software and technical solutions provided by business partners and government institutions. 3. Digital security for financial and other confidential business information. 4. Advancement of technologies such as artificial intelligence, blockchain, cloud computing, the Internet of Things, virtual reality, and others. 5. Digital transformation across all sectors of life (business, education, healthcare, government services, etc.), creating significant demand for IT solutions and services.	1. Technological degradation of the state, slow internet penetration, and low-quality network coverage. 2. Deficiencies in the software and technical solutions provided by business partners and government institutions. 3. Potential cyberattacks and cybercrimes, as well as the risk of confidential information leaks. 4. Unforeseen technical and technological risks arising from the development of innovative digital technologies.

The most significant political factors influencing the development of the IT industry in Ukraine today undoubtedly include the ongoing war, which has affected the operations of IT companies. Despite this, the IT sector continues to work quite successfully, and the government is taking certain steps to further its development by creating a favorable economic environment, including taxation policies.

Even before the full-scale invasion on July 15, 2021, the Ukrainian government passed the "Law of Ukraine on Stimulating the Development of the Digital Economy in Ukraine", which introduced a special legal regime for IT companies known as DiiaCity. This regime came into effect on February 8, 2022.

The DiiaCity regime is designed for outsourcing companies, R&D companies, product-based companies, and startups. To become residents of DiiaCity, companies must be registered in Ukraine and meet the following requirements:

- pay a minimum monthly salary of at least 1200 euros to specialists;
- engage in one of the following types of activities: computer programming, consulting on informatization issues, computer equipment management, publishing computer games and other programs, providing online software products, IT education, cybersecurity, and others;
- employ no fewer than 9 highly skilled specialists;
- the amount of qualified income of the legal entity for the first 3 months must be at least 90 percent.

By implementing this legal framework, the Ukrainian government aims to create a conducive environment for IT companies to thrive despite the challenges posed by the war and to stimulate the growth of the digital economy in the country.

The overall goal of the new legal regime is to foster the development of the IT industry in Ukraine and attract investors to the Ukrainian IT market. Some of the advantages of DiiaCity include low tax rates, as described earlier, as well as alternative forms of employment, particularly gig contracts.

According to the legislation, a gig contract is a civil law agreement between the resident of DiiaCity as the client and the gig specialist as the contractor and/or performer. Entering into a gig contract provides an attractive tax regime for both parties, with the resident of DiiaCity ensuring proper tax administration. Prior to the implementation of this regime, gig specialists were mostly individual entrepreneurs (FOP) who were often part of the third group of the unified tax.

Remunerations for gig specialists under gig contracts are subject to a 5% tax on personal income, and a unified social contribution of 22% is paid based on the determined base according to the gig contract, but not less than the minimum and not exceeding the maximum base established by the legislation.

The aforementioned tax aspects of DiiaCity residency create conditions for forming a tax haven for IT businesses in Ukraine.

As for the technological and social factors driving the development of IT companies in Ukraine, the following points are worth mentioning:

- comprehensive digitalization, which has encompassed all sectors of the economy and society at large, is a powerful factor contributing to the positive dynamics of the IT industry's further development;
- the outflow of skilled IT professionals abroad remains a challenge for Ukraine, as does the shortage of well-prepared specialists in this field from official higher education institutions.

Based on the previous analysis, the positions of the company can be determined on the proposed SWOT analysis matrix (Figure 10). As a result of the assessment, the company can identify its strategic orientation and development strategy.

It is worth noting that the factors considered in the proposed strategic analysis algorithm have different durations of impact. Therefore, while conducting a strategic analysis of the IT industry's business environment, it is essential to consider both short-term and long-term influencing factors.

Developing a development strategy using the toolkit of economic environment diagnostics allows for a higher probability of predicting functional, technological, and financial risks, avoiding errors in strategic planning, and managing the development of the business structure.

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SW – company analysis ⟶ **OT – company analysis ↓**	Strengths (advantages) companies	Weaknesses (disadvantages) companies
Potential opportunities	The strategy of the synergy of functional advantages	The strategy of competence development of the company
Potential threats	Threat neutralization strategy	Transformation and adaptation strategy

Figure 10. Matrix of alternative development strategies of companies in the IT industry based on strategic analysis.

Depending on the position in the SWOT analysis matrix, 4 strategies for the operation and development of the company can be proposed:

- strategy of the synergy of functional advantages;
- strategy of competence development of the company;
- threat neutralization strategy;
- transformation and adaptation strategy.

The strategy of the synergy of functional advantages will be achieved through the combination of the company's strengths and external environment opportunities. This strategy entails operating in the most favorable conditions for the company, enabling the maintenance and development of internal strengths of the business structure while leveraging external opportunities.

This strategy is based on high efficiency and quality of company management, sufficient financial resources, a stable financial position, a robust motivational system, employee development, and effective internal communication.

The company directs its efforts towards continuous improvement and expansion of its products and services, employing creativity, innovation, and uniqueness in its offerings. In such a strategic position, the company possesses a well-developed corporate culture that enhances its market image, as well as a powerful brand, reputation, and global presence. All internal processes are organized with high quality, and structural units are well-coordinated.

The mentioned strategy will involve leveraging all the strengths of the business structure in a stable, predictable, and favorable environment. The company can allocate its resources towards business expansion, long-term projects, and realizing all its advantages, as it operates in an economically and politically stable situation. Specifically, favorable aspects include legislative regulation and legal framework, protection of intellectual property and data privacy, investment climate, growth in the IT services market, favorable tax and currency policies, and the government's engagement in economic globalization processes.

The company can also benefit from social and technological factors, such as the high quality of IT education provided by educational institutions, societal interest in technology and its widespread adoption, adequate digital literacy among citizens of different ages, and the safety of internet technology usage within the country. Additionally, there is a keen interest in digital transformation in various spheres of society's life.

Utilizing these external environmental opportunities in combination with the company's advantages will enable sustainable development, strong market positioning, and the utilization of competitive strengths to achieve strategic objectives.

In situations where a company faces a combination of the aforementioned external environmental opportunities and internal weaknesses, it is advisable to adopt a Competency Development Strategy. This strategy involves transforming the company's weaknesses into strengths by leveraging favorable characteristics of the external environment. Specifically, to turn weaknesses into strengths, the company should focus on enhancing the skills of its personnel through training programs and increasing employee motivation. Addressing internal conflicts within the organization is essential, as well as establishing effective communication channels and procedures, possibly involving external experts.

To improve the financial situation, conducting a thorough financial audit and developing a plan to enhance financial indicators is crucial. Exploring opportunities for external investments or credit resources, if necessary, can be considered. Cost optimization and a focus on profitable projects are essential steps. Implementing an internal incentive system that promotes creativity and innovation among employees is vital. Disseminating and propagating the company's values and mission among the workforce will foster a sense of shared purpose.

In addition, efforts should be concentrated on branding and marketing to enhance the attractiveness of the company's brand. If necessary, the company should be open to adapting its business model to ensure flexibility and scalability while optimizing internal business processes.

The SWOT analysis matrix segment that combines a company's strengths with threats generated by the external environment is known as the "External Threat Neutralization Strategy." This strategy aims to develop the company's strengths to mitigate or limit the impact of external threats. It is typically employed during financial and economic crises, deteriorating market conditions, such as the IT services market, declining business activity, and an unfavorable and unstable regulatory system across various business processes, along with societal, social, and technological issues.

Under such circumstances, the company should focus on protecting itself from environmental threats by leveraging its strengths. While it may not completely neutralize all external threats, it can significantly reduce their impact by bolstering its business structure through the development and support of its strengths. The strategy should involve initiatives such as creating a flexible business plan to adapt to unpredictable changes in the political and economic environment, establishing mechanisms for rapid response and redirection to new markets and opportunities, and engaging experts and legal professionals to monitor and influence legislative and regulatory policies, safeguarding financial interests and intellectual property.

Furthermore, the company may concentrate on the development and implementation of innovative technologies and solutions that meet complex market demands and needs. It can also employ differentiation strategies to identify unique market niches and gain competitive advantages. Exploring expansion opportunities in foreign markets with more favorable regulatory climates and investment environments, as well as tax policies, could be considered.

Factors beyond the company's direct influence, such as internet freedom, censorship, educational environment, and overall technological development and acceptance in society, may not be within the company's control. However, in adverse external circumstances, the business can explore alliances and partnerships with other entities facing similar challenges and interests to seek effective joint solutions. The need to develop the company's strengths, which were emphasized above, is also evident in this strategy.

The transformation and adaptation strategy is employed by companies whose SWOT analysis reveals a position that combines environmental threats with the company's weaknesses. In such cases, there is a need to overcome threats and address the shortcomings of the IT company while ensuring maximum protection against external environmental threats. This position poses significant risks to the company, and under these circumstances, all management efforts should be focused primarily on overcoming weaknesses and transforming them into company advantages.

In the long term, if the company fails to transform and adapt to environmental threats, there are significant risks of bankruptcy and cessation of operations. Therefore, utilizing strategic analysis tools, including PEST and SWOT analysis, allows for effective decision-making in the management of IT companies through continuous monitoring and forecasting of the economic environment.

Through a thorough analysis of the external environment using PEST analysis (Political, Economic, Social, and Technological factors) and internal assessment using SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), the company gains valuable insights into the challenges it faces and the opportunities available to it. By identifying weaknesses and threats, the company can develop appropriate strategies to address them and protect itself from potential risks. Additionally, recognizing opportunities and strengths enables the company to capitalize on its advantages and position itself favorably in the competitive IT sector.

Continuous monitoring and forecasting of the economic environment allow the company to stay agile and adapt to changes effectively. This strategic approach helps the management make informed decisions to overcome challenges and ensure the long-term sustainability and success of the IT company.

In summary, the transformation and adaptation strategy, supported by strategic analysis tools such as PEST and SWOT, enables IT companies to proactively address weaknesses, mitigate threats, capitalize on opportunities, and ensure their competitiveness in the dynamic business landscape.

DISCUSSION

The IT industry in Ukraine indeed remains at the center of discussions and debates concerning its future development. The conducted forecasts for IT exports indicate that even under a pessimistic scenario, and with considerations of the trends in the year of the war in 2022, IT export volumes are expected to continue growing. The industry also anticipates

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an influx of investments, as the favorable regime of Diia City for IT companies has begun functioning and has received positive feedback from residents.

Research on the trends in the development of the IT market in Ukraine and the calculation of forecasted indicators for IT exports or the number of IT specialists have been conducted in numerous works (Melnyk T., and Zavhorodnya E. (2022); Rakhman, M., and Korabelskiy, S. (2020); Zhuravlyov, O. V., and Simachev, O. A. (2018)) and reports (). However, these studies were carried out before 2022, before the war. According to these research works, the IT business in Ukraine was expected to grow rapidly, taking into account the human resource potential, state support, tax benefits, and the creation of a favorable investment climate overall.

Our research results, considering the war factor, are less optimistic but still positive in the context of the industry's further development.

The use of strategic analysis is a crucial element in research and serves as a methodological foundation in various fields, including economics, management, mathematics, logistics, energy, finance, and others. This toolkit is employed in different aspects of environmental evaluation: risk assessment, planning, and forecasting, evaluating the current situation, and competitive advantages. Some researchers combine the SWOT and PEST analysis tools to study the environment, such as Yongfu Huang (2019), L. Zhu, E. et al. (2015), Xiong W. (2023), Zhao L., and Ying W. (2021), Xing, F., Peng, G. and Huang, Z. (2022), and others. Many scholars conduct research using SWOT and PEST analyses separately, like Hani P. et.al (2023), Stasytytė, V. & Pilionienė, R. (2016), Gretzky, W. (2010), Reihanian, A. (2012), Karyono, O., & Agustina, K. (2019), Cox, J. (2021) and many others. A study by Rakhman M. and Korabelskiy S. (2020) focuses on analyzing the state of the IT industry in Ukraine using the SWOT and PEST toolkit. However, the full-scale war significantly altered the business operating environment, prompting our investigation.

Key environmental factors highlighted by most researchers in the mentioned works include the quality of company management, tax regulations, and economic growth or decline. Unlike previous studies, most scholars do not provide comprehensive solutions and strategies for business entities based on the analysis results. In our view, utilizing strategic analysis tools to identify influential factors in business entities' operations should be geared towards making informed decisions, ensuring competitive advantages, and formulating effective strategies.

CONCLUSIONS

Current trends in digitalization, intensified competition in the IT sector, and rapid development of information technologies overall provide ample opportunities for the growth of IT companies. However, they also compel these companies to continuously implement innovations in various aspects of their operations to maintain their competitiveness. In such conditions, it is essential for companies to equip themselves with relevant analytical tools, such as PEST and SWOT analysis, to substantiate managerial decisions regarding their future development through continuous monitoring and forecasting of the economic environment.

The use of PEST and SWOT analysis in this field offers the following benefits: a comprehensive consideration of the impact of both internal and external factors on the company's development, as well as the minimization of risks arising during the functioning of IT industry companies. Furthermore, it allows for optimizing the diagnostic process of the economic environment's influence on the formation and implementation of development strategies for IT companies through the algorithm of conducting a SWOT analysis.

Analysis of the trends in the development of the IT industry in Ukraine indicates its powerful potential and significant prospects for further growth. The volume of IT products exported and the demonstrated resilience and adaptability of IT companies during times of conflict provide grounds for considering this sector as one of the priorities for the country's economy.

After analyzing the internal and external factors influencing the development of IT companies using SWOT and PEST analysis, we have developed a matrix of alternative development strategies for IT companies. This matrix enables companies to better and faster navigate the volatile external environment and effectively capitalize on their strengths or neutralize their weaknesses. This approach to strategy formation is aimed at ensuring the efficient functioning of IT company management in defining their position in the industry and selecting the appropriate strategy from the matrix of alternative development strategies for IT companies in a dynamic environment. Each strategy comes with a set of recommendations for combining appropriate actions to secure long-term competitive advantages for companies in the market, considering the political, economic, social, and technological components of the external environment and providing an objective assessment of the internal environment.

ADDITIONAL INFORMATION

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ДОСЛІДЖЕННЯ IT-БІЗНЕСУ В УКРАЇНІ: ТЕНДЕНЦІЇ, ПРОГНОЗИ ТА СТРАТЕГІЇ РОЗВИТКУ

Дослідження розвитку IT-галузі є ключовим для формування стратегічних рішень державних органів і бізнесу, спрямованих на створення конкурентоспроможної та інноваційно спрямованої економіки, а також для прогнозування можливостей і викликів, які чекають на цю галузь у майбутньому. Мета роботи – провести аналіз тенденцій IT-галузі в Україні та спрогнозувати динаміку розвитку ключових показників її розвитку, а також запропонувати науковий підхід щодо формування стратегій розвитку IT-компаній на основі стратегічного аналізу.

У статті проведено детальний аналіз та огляд сучасних тенденцій розвитку IT-галузі в Україні. Авторами досліджено ключові фактори й виклики, що впливають на динаміку цього сектора в країні, та визначено відповідно конкурентні переваги й потенційні обмеження для його розвитку. Представлений також прогноз обсягів IT-експорту з України як ключового показника розвитку IT-галузі на найближчі роки, який базується на аналізі поточних даних і тенденціях розвитку галузі, ураховуючи рік повномасштабної війни, що дозволяє дати об’єктивний перспективний погляд на можливості зростання і розвитку IT-сектора в Україні. Проаналізовані фактичні та прогнозні дані дають підстави вважати IT-галузь перспективною для подальшого розвитку економіки нашої держави.

У статті зосереджено увагу на важливості використання стратегічного аналізу для розвитку IT-компаній, зокрема в частині розробки стратегій розвитку IT-компаній рекомендується використання двох основних інструментів – SWOT-аналізу та PEST-аналізу. Авторами розроблено матрицю альтернативних стратегій розвитку IT-компанії залежно від її позиції в контексті наявності внутрішніх сильних і слабких сторін та існуючих можливостей і загроз іззовні. Такий підхід дозволяє компаніям більш об'єктивно оцінити свої можливості, зрозуміти загрози та ухвалювати дієві стратегічні рішення, спрямовані на успіх і стабільний розвиток у швидкозмінному середовищі.

Ключові слова: IT-бізнес, IT-експорт, IT-компанії, IT-спеціалісти, прогнозування, SWOT-аналіз, PEST-аналіз, стратегічний аналіз, стратегії розвитку

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