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# HUMAN CAPITAL IN UKRAINE'S IT SECTOR: ANALYSIS OF THE CURRENT STATE, STATISTICS, AND DEVELOPMENT PROSPECTS

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## Vilkhivska O. V. Human Capital in Ukraine's IT Sector: Analysis of the Current State, Statistics, And Development Prospects

*This article analyses the current state of human capital in Ukraine's IT sector, its impact on industry development, and the country's competitiveness amid global challenges. The article examines both the quantitative and qualitative characteristics of human capital, including education levels, professional growth, migration processes, and investments in the IT sphere. Special attention is given to the effects of war on the labour market, changes in the geographical concentration of specialists, and the income dynamics of IT professionals over the past 10 years. The study reveals a significant redistribution of IT specialists within the country and abroad, shifts in employment structures, and the growing popularity of entrepreneurial work models. It also reviews key educational initiatives and their influence on workforce training, the level of English proficiency among IT specialists, and its role in professional development. Particular focus is placed on the migration trends of Ukrainian IT professionals and the impact of global transformations on the labour market. The article identifies key issues and challenges facing the sector, such as the need to adapt educational programs, implement strategies to prevent brain drain, and improve conditions for professional growth. The research findings can be useful for developing both governmental and corporate strategies for the growth of Ukraine's IT sector, as well as for shaping measures to preserve and expand human capital in the digital economy.*

**Keywords:** human capital, Ukraine's IT sector, specialist migration, education, digital economy, labour market, competitiveness, investments.

**Fig.:** 5. **Bibl.:** 8.

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## Вільхівська О. В. Людський капітал в ІТ-секторі України: аналіз поточного стану, статистика та перспективи розвитку

*У статті проведено аналіз поточного стану людського капіталу в ІТ-секторі України, його впливу на розвиток індустрії та конкурентоспроможність країни в умовах глобальних викликів. Розглядаються кількісні та якісні характеристики людського капіталу, включаючи рівень освіти, професійне зростання, міграційні процеси та інвестиції у сферу ІТ. Особлива увага приділяється впливу війни на ринку праці, зміні географічної концентрації фахівців, а також динаміці доходів ІТ-фахівців протягом останніх 10 років. Дослідження виявляє значний перерозподіл ІТ-фахівців усередині країни та за її межами, зміну структури зайнятості, а також зростання популярності підприємницької моделі роботи. Проаналізовано основні освітні ініціативи та їх вплив на підготовку кадрів, рівень володіння англійською мовою серед спеціалістів та її роль у професійному розвитку. Окрему увагу приділено динаміці міграційних настроїв серед ІТ-фахівців України та впливу глобальних трансформацій на ринок праці. Визначено ключові проблеми та виклики, що стоять перед галуззю, включно з необхідністю адаптації освітніх програм, впровадженням стратегій щодо запобігання витоку фахівців та покращенням умов для їх професійного зростання. Результати дослідження можуть бути корисними для розробки державних і корпоративних стратегій розвитку ІТ-сектора України, а також для формування заходів щодо збереження та примноження людського капіталу в цифровій економіці.*

**Ключові слова:** людський капітал, ІТ-сектор України, міграція спеціалістів, освіта, цифрова економіка, ринок праці, конкурентоспроможність, інвестиції.

**Рис.:** 5. **Бібл.:** 8.

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The IT sector of Ukraine plays a crucial role in the country's economy, demonstrating steady growth even amidst military conflict. Human capital, as the main resource of the industry, determines the competitiveness of Ukrainian IT in the global

market. The number of specialists, their qualifications, education level, and professional development all influence the future prospects of the IT industry.

A significant number of scholars have explored the scientific study of human capital in the IT sec-

tor. Among them, the following researchers can be highlighted: Sedliar D. O. (analyzes qualitative and quantitative indicators of human capital development in the country, including education, healthcare, and migration processes) [1]; Zhukovska S. T. (examines investment in human capital within Ukraine's IT sector in the context of war) [2]; Babichev A. V. and Peliukh O. I. (investigate strategic aspects of human capital development in Ukraine, focusing on the integration of veterans into the industries of 4.0 and 5.0) [3]; Arkhiereiev S. I. and Lykova A. S. (explore the current state of Ukraine's information technology market, the role of human capital, and its impact on the country's foreign economic activities) [4].

The research of these scholars emphasizes the importance of targeted investments in education, healthcare, and the adaptation of specialists to the challenges of the digital economy. Their findings form the basis for developing recommendations for the growth of Ukraine's IT sector, shaping educational and economic strategies, and improving public policies in the field of the digital economy.

The **aim of this article** is to analyze the current state of human capital in Ukraine's IT sector, examine changes in the concentration of IT companies in the market, explore educational initiatives, assess the migration trends of specialists, and analyze the income dynamics of IT professionals over the past 10 years.

Modern geopolitical and economic conditions, including war and crises, have significantly affected the labor market. Currently, the analysis of human capital in Ukraine's IT industry and the search for solutions to preserve and develop it are of particular relevance. Before February 24, 2022, more than 70% of IT industry employees were concentrated in major cities such as Kyiv, Kharkiv, and Lviv. The war has drastically influenced the distribution of IT specialists, with Kharkiv being especially affected. The share of IT workers in Kharkiv decreased significantly, from 14% in 2021 to 4% in 2025. Today, the primary IT hubs in Ukraine are Kyiv and Lviv. Although many specialists left Kyiv in 2022, a considerable number have gradually returned.

Currently, 42% of IT specialists are based in Kyiv, which is 3% less than in 2021. During the war, a large number of professionals relocated from Kyiv, Kharkiv, Dnipro, and Odesa to the western regions of Ukraine. As a result, the share of Ukrainian IT specialists in Lviv increased from 14% in 2021 to 21% in 2022 and stabilized at 18% in 2023–2024. The share of IT professionals in Ivano-Frankivsk also rose – from 2% in 2021 to 5% in 2022 – and stabilized at 3% in 2023–

2024. Meanwhile, the proportion of IT specialists who moved abroad after 2022 but plan to return dropped to 4% in 2024, compared to 8–9% in 2022–2023. *Fig. 1* illustrates the concentration of IT specialists from 2022 to 2024 [5–8].

The concentration of company offices has also changed significantly, especially in Kharkiv. As of 2024, there are only 10 IT company offices operating in Kharkiv, compared to 25 three years ago. Kyiv remains the leading city in terms of IT company offices (46), followed by Lviv with 23. In the second half of 2024, four companies closed their offices in Ukraine: Avenga and Playrix in Kyiv, SQUAD in Uzhhorod, and GlobalLogic in Mykolaiv. The distribution of IT company offices is illustrated in *Fig. 2* [5–8]. Major IT companies such as Svitla Systems, AUTODOC, N-iX, Trinetix, SKELAR, Viseven, and GlobalLogic have been expanding their presence mainly in Europe, India, and Argentina. Throughout 2024, not a single new IT office was opened in Ukraine.

The majority of IT specialists in Ukraine work as entrepreneurs, accounting for approximately 73% of the total. Using this employment model, we can analyze the growth and transformation of the IT sector in Ukraine over the past 10 years (see *Fig. 3*) [5–8].

Thus, the number of IT specialists registered as entrepreneurs has increased 3.5 times over the past 10 years – from 77.000 to 275.000. The most significant growth occurred between 2019 and 2022, during which the number of entrepreneurs increased by approximately 30.000 specialists each year.

2023 was expectedly the worst year in the past decade. From March 2023 to March 2024, the number of IT entrepreneurs grew by only 3.580 people, and the revenue from IT services significantly declined compared to 2022.

Before the war, Ukrainian IT specialists were divided into two groups: Around 45% did not plan to emigrate from Ukraine. Another 45% considered moving abroad but were not actively preparing for it. 7–9% of IT specialists actively planned relocation, and their share gradually decreased from 9% in 2016 to 7% in 2021.

The full-scale invasion changed the situation. In 2022, the share of specialists actively seeking to leave increased by 13%, while the proportion of those who did not plan to leave grew to 56%. In 2023, the share of specialists actively preparing to leave rose to 8%, while the proportion of those who did not intend to leave remained at 55%. In 2024, the desire to emigrate has intensified: currently, 15% of IT specialists want to leave, while the share of those who do not plan to emigrate has decreased to 44%.

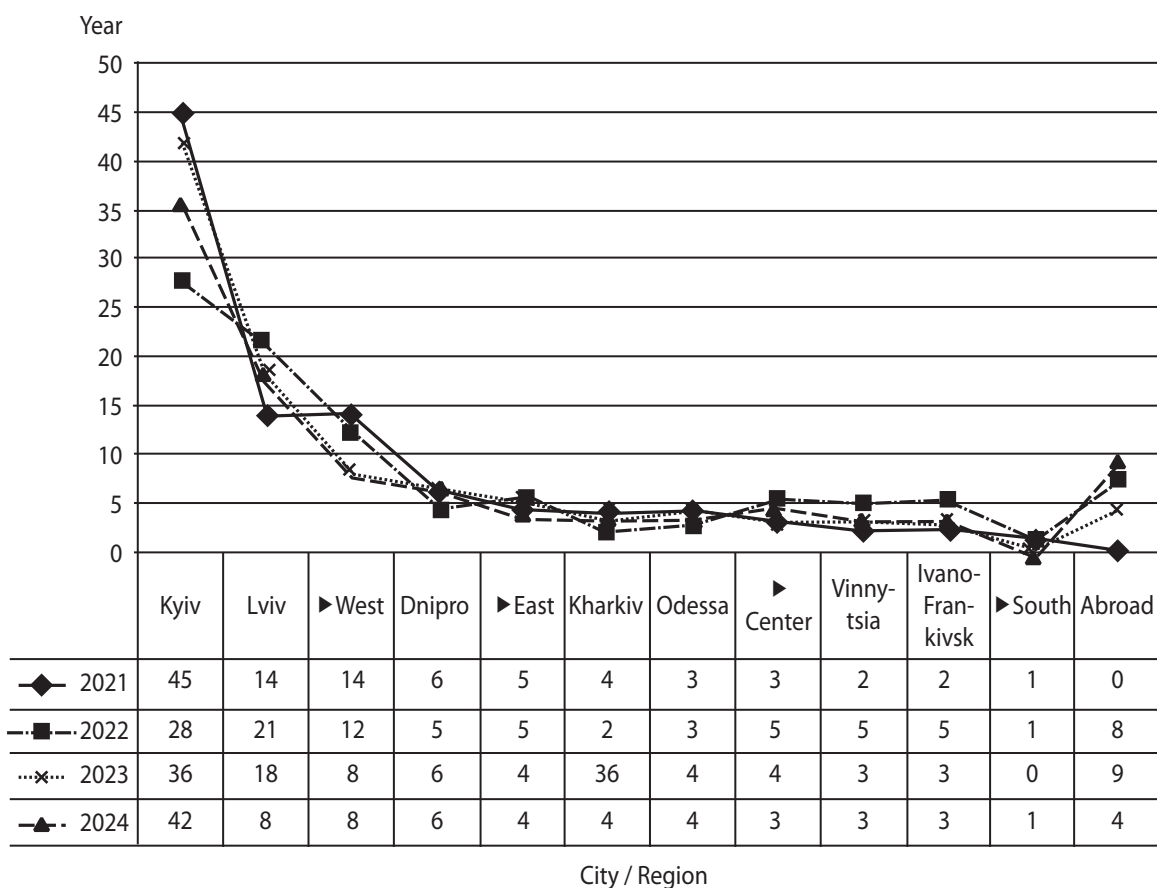


Fig. 1. IT Specialist Concentration (2022–2024)

Source: [5–8].

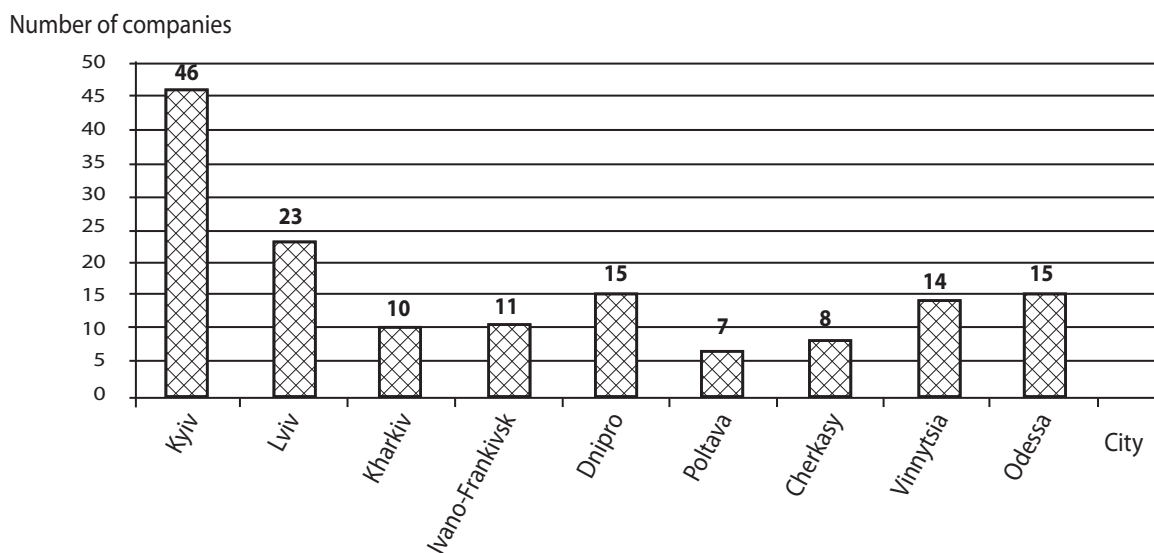


Fig. 2. Concentration of company offices

Source: [5–8].

The dynamics of IT specialists' willingness to emigrate from 2016 to 2024 is presented in Fig. 4 [5–8]. Regarding IT specializations, their overall number has significantly increased over the past decade. The share of technical specialists, particularly developers, has

gradually decreased. In 2015, developers accounted for 61% of all Ukrainian IT specialists, whereas in 2024, this figure has dropped to 47%. The share of QA specialists has remained almost unchanged: in 2015, they made up 18%, while in 2024, they account for 17%.

## Number of entrepreneurs

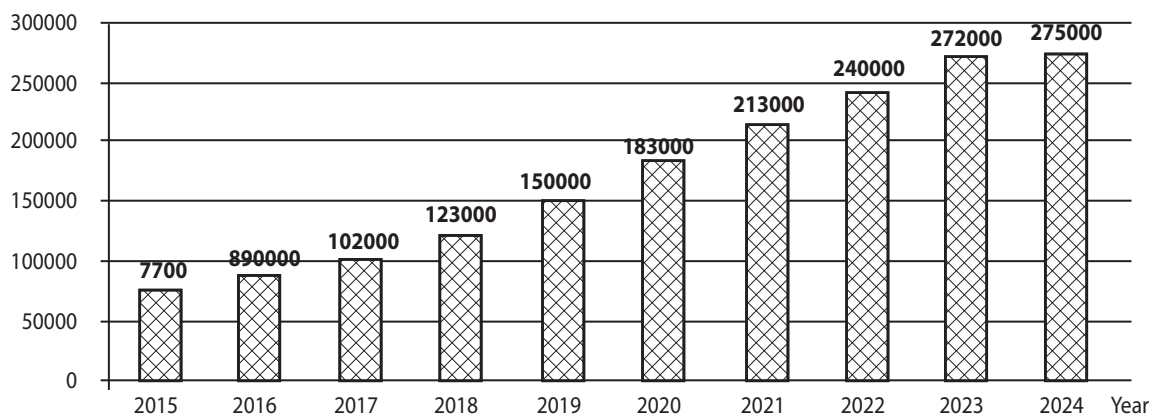


Fig. 3. Number of IT specialists working as entrepreneurs

Source: [5–8].

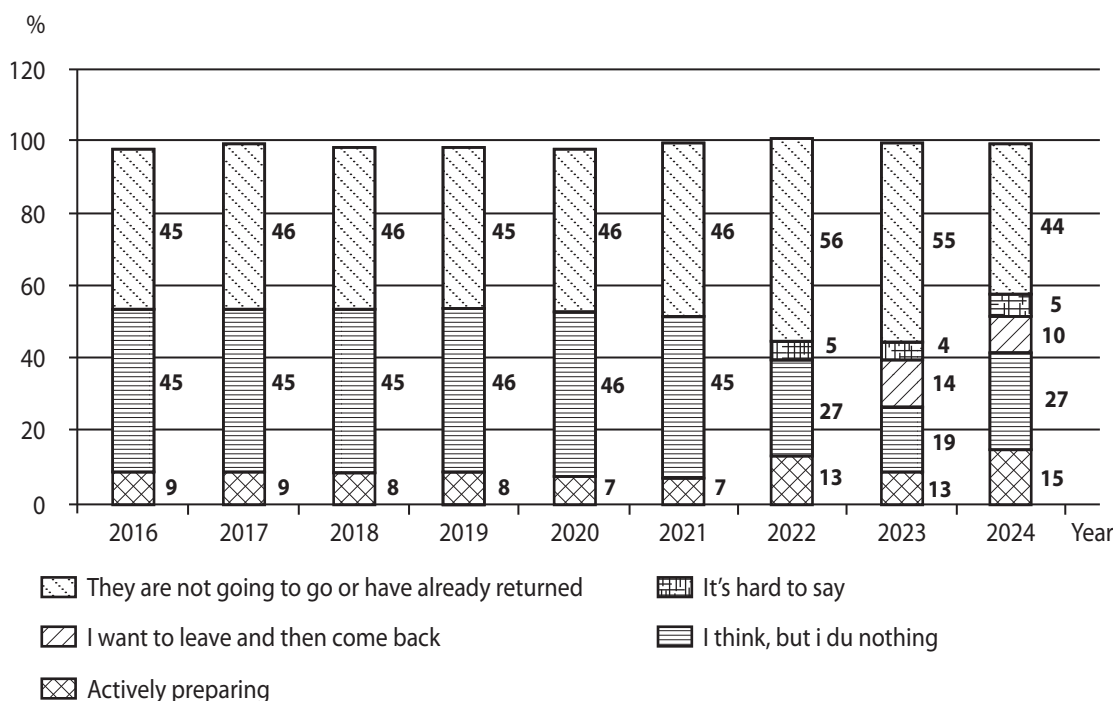


Fig. 4. Dynamics of IT Specialists' Willingness to Emigrate

Source: [5–8].

The number of specialists in DevOps/SRE has increased (4% in 2025 compared to 1% in 2015), along with analysts (4% vs. 2%), designers and artists (4% vs. 2%), and Data Science/Data Engineering specialists (3% vs. 1%). At the same time, the number of system administrators has decreased, dropping from 3% in 2015 to 1% in 2025.

The share of non-technical specialists has grown from 4% in 2015 to 10% in 2025, primarily due to the rise of HR and recruitment specialists (from 2% to 5%) and marketing professionals (2% vs. 1% in 2016).

The minimum entry age into the IT industry in Ukraine in 2025 is 23 years. In 2017–2019, specialists

with up to two years of experience made up nearly half of all IT professionals in Ukraine. In 2020, the share of newcomers declined due to the pandemic, but in 2021, it recovered to 39%.

After the onset of the war, this trend changed: opportunities for beginners in IT became scarcer. The share of junior specialists declined in 2022–2023 and fell to its lowest level in the past 10 years in 2024 – just 24%. Currently, 76% of IT professionals in Ukraine have more than two years of experience in their specialization. Additionally, 96% of IT specialists have completed or are pursuing higher education. The share of IT professionals with only secondary or vocational



education has remained unchanged over the last decade at 4%.

English proficiency plays a crucial role in IT education and employment. Ukrainian IT professionals recognize this and actively improve their language skills. Ten years ago, 40% of IT specialists assessed their English level as Upper-Intermediate or Advanced; today, this figure has risen to 59%. Meanwhile, the share of specialists with an Intermediate level has dropped to 21%.

Despite the challenges faced by Ukraine's IT industry during the war, salaries in all specializations have significantly increased compared to 2020.

Part of this salary growth can be explained by the increasing share of experienced specialists at the Senior+ level. Let's compare salaries for the same positions over the past 10 years. In 2015, the salary of a Senior Software Engineer (SE) was \$3,000, while in 2025, it has risen to \$4,700. The salary of a Middle SE increased from \$1,600 to \$2,500, and for a Junior SE, it grew from \$600 to \$935.

QA (Quality Assurance) specialists have also seen salary changes. In 2015, a Senior QA earned \$2,140, while in 2025, this figure has grown to \$3,200. The salary of a Middle QA increased from \$1,249 to \$1,755, while Junior QAs saw growth from \$500 to \$800 per month. Regarding bonuses, 31% of IT specialists received bonuses in 2021, but this number decreased to 23% in 2022.

The distribution of IT professionals between product and service companies has shifted over the past decade. In 2024, 45% of IT specialists were employed in product companies, surpassing the 36% working in service companies. In 2015, the situation was the opposite: 50% of professionals worked in service companies, while only 29% were in product companies. The share of professionals in product companies increased significantly during the full-scale invasion.

Additionally, the share of specialists working in outsourcing companies grew from 9% in 2015 to 12% in 2025. The percentage of professionals working in startups has remained unchanged at 4%. The specialization of IT companies varies significantly across major cities. Kyiv and Odesa have consistently led in the share of IT specialists employed in product companies. In Kyiv, this share increased from 35% in 2015 to 55% in 2024. In Odesa, it grew from 32% to 47%. Dnipro historically had a dominance of service companies, with product companies accounting for only 32% in 2015. However, over the past 10 years, their share has increased to 41%, nearly equalling the 38% working in service companies. Kharkiv was also historically dominated by service companies, with 61% of IT specialists employed in them in 2015. Today, the distribu-

tion is almost equal: 41% in product companies and 38% in service companies. Lviv has remained a hub for service and outsourcing companies. In 2015, 72% of IT professionals worked in service companies, and 11% in outsourcing. By 2024, these numbers shifted to 47% and 16%, respectively. The share of product company specialists in Lviv remains noticeably lower than in other cities at 31%.

In 2015, small companies with fewer than 50 employees dominated the market, employing 41% of IT specialists. A similar share (39%) worked in medium-sized companies (50–1000 employees), while large companies (1000+ employees) accounted for 19% of the workforce.

By 2017, the industry saw rapid growth, and the share of IT specialists in large companies (1000+ employees) increased from 16% in 2017 to 29% in 2022. However, following the full-scale invasion, this trend reversed, with the share of large-company employees declining to 22% over the past two years.

At the same time, the share of small-company employees (up to 50 employees) increased from 26% in 2022 to 31%, while the share of medium-sized company employees (50–1000 employees) grew from 45% to 47%. The distribution of IT companies in Ukraine by size from 2015 to 2024 is presented in Fig. 5 [5–8].

IT companies in Ukraine predominantly work with entrepreneurs, who make up 73% of the workforce. The highest number of entrepreneurs in IT companies was recorded in 2021–2022, reaching 86–87%. Since 2023, their share has declined due to the introduction of gig contracts. Currently, 13% of IT specialists are employed under gig contracts.

Gig contracts are most actively used by specialists in product and service companies, where their shares stand at 15% and 13%, respectively.

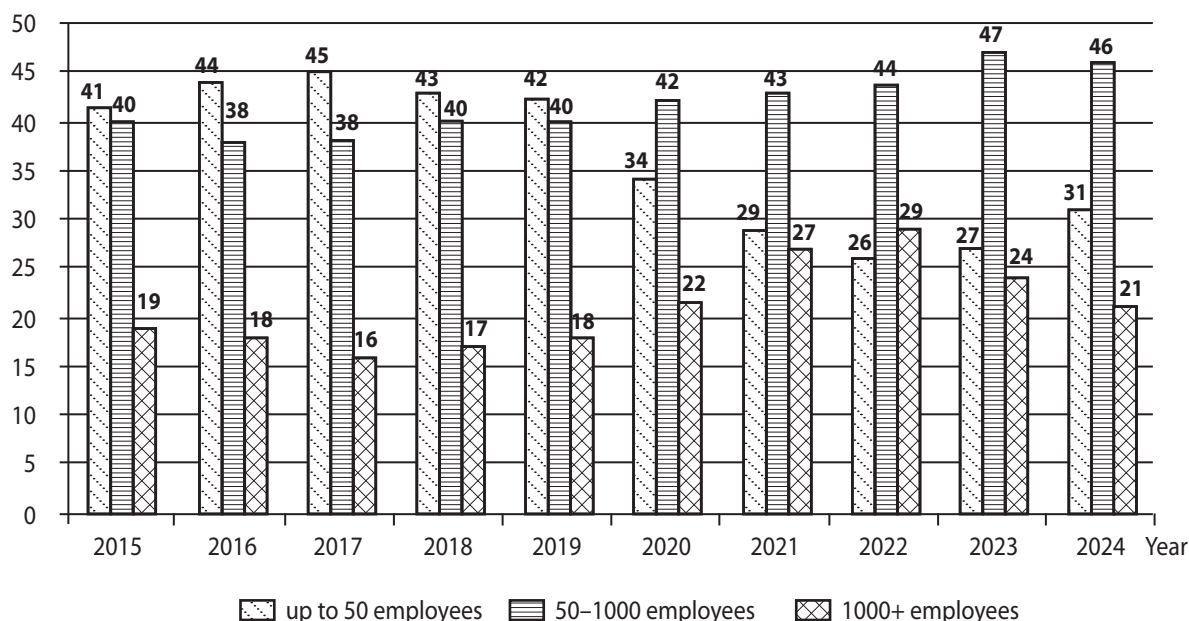
As was the case ten years ago, the vast majority of IT professionals still find their work interesting. Interest in work is directly linked to income satisfaction.

The highest level of job appreciation is observed among top-tier technical specialists, security experts, and technical writers, with 95% of them considering their work engaging. The least interested groups include support service specialists (82%), HTML coders (85%), as well as system administrators and customer support professionals.

## CONCLUSIONS

The study shows that Ukraine's IT sector continues to develop even under challenging wartime conditions. The key factor driving its growth is human capital, which includes the qualifications of specialists, their level of education, and professional development.

## Share of companies



**Fig. 5. Share of IT Companies by Size (2015–2024)**

Source: [5–8].

It is important to note that there has been a redistribution of IT professionals both within the country and beyond its borders. The war has triggered significant migration processes, particularly from Kharkiv, Dni-pro, and Odesa to the western regions of Ukraine.

The employment structure has changed, with an increase in the number of IT entrepreneurs, while the number of entry-level specialists is decreasing due to the difficult economic situation.

Despite the crisis, salaries for various categories of professionals have risen. This growth can be attributed to the increasing share of experienced specialists in the workforce. Despite the challenges, the IT sector remains a crucial industry for Ukraine's economy. High-quality investments in human capital, improvements in working conditions, and modernization of the education system will enable Ukraine to maintain and expand its potential in the high-tech sector.

Thus, for the sustainable growth of the sector, it is essential to address the issue of brain drain, promote educational initiatives, and enhance government policies supporting the digital economy. ■

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