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ANALYSIS OF THE LEVEL OF INCLUSIVE DEVELOPMENT IN UKRAINIAN IT INDUSTRY

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Abstract. The research article analyzes the inclusive development of the IT industry in Ukraine. Inclusivity implies the availability of economic growth results for all citizens and taking into account the individual needs of citizens in the process of forming directions of economic development. In world practice, the Inclusive Development Index is calculated based on indicators characterizing economic growth. The IT industry in Ukraine is a promising sector of the economy, characterized by profitability, export orientation and rapid growth rates. The inclusive development of the IT industry depends on a significant number of factors, for example: the instability of the economic, political and security situation in Ukraine, as a result of a full-scale war, the world recession, the variability of legislation and tax policy. The development of the IT industry in Ukraine was studied through an assessment of the market for information equipment, services and technologies, and software. The largest number of business entities in the IT market is engaged in computer programming, consulting and related activities, and the number of such companies is growing every year. This gives grounds to argue that programming is a promising type of activity in Ukraine. A significant share in the structure of the IT sector belongs to companies engaged in the provision of information services, including data processing, posting information on websites and related activities, development and support of web portals and other information services. The IT industry in Ukraine is showing a growth trend, which is primarily confirmed by the growth in number of service providers and manufacturers of goods in this segment. Over the 10-year analyzed period, the number of providers of computer programming, consulting and related activities increased by 2.94 times, the number of computer game manufacturers increased by 1.78 times, the number of business entities providing information services increased by 2.98 times. The inclusiveness of information technologies for Ukrainian society was studied through an analysis of the: accessibility of the Internet for citizens, inclusiveness of state web services number of users of mobile operator services. The inclusiveness of state online resources continues to grow; by the end of 2023, 23% of official websites of state authorities reached a sufficient and high level of accessibility for people with hearing, vision, and musculoskeletal disorders. Inclusive development of the IT industry is an important component of the Digital Transformation Strategy of Ukraine, which aims to develop an inclusive, accessible and effective social sphere in Ukraine through the integration of digital technologies and innovations.

Keywords: IT industry, inclusive development, inclusivity, digitalization, information technologies.

JEL Classification: I31, L63, L86

1. Introduction

The inclusive development of the IT industry in Ukraine is becoming increasingly relevant in the context of a growing share of society belonging to vulnerable categories, in particular people with disabilities, parents raising a child with disabilities. The inclusiveness of the IT industry faces a number of challenges for different age groups. Young people usually adapt quickly to new technologies, but employment opportunities in the IT industry for young people are limited due to a lack of experience or the necessary skills. Middle-aged people may experience difficulties using information technologies, as IT technologies are developing rapidly. A part of the older population often faces barriers in the form of insufficient digital skills and prejudices regarding their ability to master new technologies. To overcome these problems, it is necessary to develop and implement comprehensive approaches to the inclusive development of the IT industry, including adapted

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educational programs, mentoring, and the creation of flexible working conditions that take into account the needs and capabilities of each age group and vulnerable categories of the population.

Aspects of inclusive development are revealed in the works of A. Bazyluk and O. Zhulin (Bazyluk and Zhulin, 2015), O. Prognimak (Prognimak, 2018) and other scholars. The development of the IT industry in Ukraine was studied by L. Galan and Y. Smolyar (Galan and Smolyar, 2022), R. Kornyliuk (Kornyliuk, 2024), P. Kutsyk, N. Tulika and A. Protsykevich (Kutsyk et al., 2024), O. Syaska (Syaska, 2024) and others.

A lot of scientific attention has been devoted to the study of the IT industry, and the issue of inclusivity has also been widely studied. However, the sphere of inclusive development of the IT industry of Ukraine, as an important component of the integration of vulnerable social categories into society, requires in-depth study, which makes this study relevant.

2. Theoretical Basis

The work is devoted to the analysis of the level of inclusive development of the IT industry in Ukraine, which involves studying the structure of the IT industry market in terms of business entities – providers of goods and services, assessing the accessibility of the Internet for the population, and studying the issue of increasing the level of digitalization of Ukrainian society.

3. Results

31. Formal Aspects of Inclusive Development of the IT Industry

Many scholars have studied aspects of inclusive development. Most often, the issue of inclusive development is associated with the need to apply the principles of inclusiveness to stimulate economic growth. In a general sense, inclusiveness is considered to be the wide availability of the results of economic growth for all members of society and the orientation of economic development to take into account the needs of the individual (Bazyluk and Zhulin, 2015, p. 20).

Many scientific methods have been developed to determine the level of inclusive economic growth, in particular, international organizations (UN, IMF) have recommended taking into account a significant number of indicators using mathematical tools to determine a composite index-indicator of the level of economic growth. It is proposed to take into account many groups of indicators (social, economic, environmental, financial and human) (Prognimak, 2018, p. 190-191). In world practice, the Inclusive Development Index is used. This index was first proposed to be calculated at the World Economic Forum, and since 2017, the Inclusive Development Index has been calculated annually for 103 countries around the world based on indicators characterizing economic growth, including: employment rate, gross domestic product per capita, life expectancy, labor productivity, average household income, demographic burden, public debt, poverty and inequality, savings, and environmental pollution (The Inclusive Growth and Development Report, 2017).

At the same time, analyzing the inclusiveness of the development of the IT industry, the complexity of applying existing aggregate indicators of inclusive development was revealed, which is associated with the peculiarities of the functioning and development of the information industry.

In a broad sense, the IT industry is understood as the sphere of production (development) of information goods and services of various types based on modern information technologies, which includes both the software direction (mobile applications, computer programs, specialized adaptive software complexes, etc.), and the direction of technical equipment for using these technologies – hardware direction (computers and additional accessories, specialized equipment for accessing virtual reality, etc.).

The information technology industry in Ukraine attracts attention as a promising area for economic growth and stable development. The factors that have encouraged the development of this industry over the past few decades are the high level of wages, the possibility of receiving wages in foreign currency, the active search and attraction of young specialists, the high level of profitability of the IT business, the export orientation of the IT business, and the high stability of economic growth in this segment of the economy.

However, the IT sector in Ukraine, like other sectors of the economy, was negatively affected by the full-scale war that began in 2022. Analysis of open data suggests that at the initial stage of the war, the IT sector demonstrated stability, but subsequently there was a trend of decreasing activity in the information technology market (Kornyliuk, 2024).

3.2. Assessment of the Activity of Business Entities in the Ukrainian IT Industry

Analyzing open statistical data, we can draw conclusions about what is actually happening with the IT market economy, which companies hold leading positions in terms of revenue, and which regions of Ukraine remain the most promising for IT business. First of all, let's take a closer look at the activity of the IT industry in Ukraine by studying the structure of the market for information equipment, services and technologies. To do this, we will group

business entities by types of economic activity related to the IT industry, namely:

1. Production of computers, electronic and optical products (including the production of electronic components and boards, the production of computers and peripheral equipment, the production of communication equipment);
2. Trade in information, communication, peripheral equipment, computers, software (including wholesale and retail trade, trade in specialized stores);
3. Creation of computer games;
4. Computer programming, consulting and related activities (including computer programming, consulting on informatization, computer equipment management activities, other activities in the field of information technology and computer systems);
5. Provision of information services (including data processing, posting information on websites and related activities; web portals, provision of other information services, and activities of information agencies).

According to the State Statistics Service of Ukraine, the largest number of business entities in the information services and goods market is engaged in computer programming, consulting and related activities, in particular, according to the results of 2023, these entities accounted for 76% of the IT industry market. This gives grounds to argue that programming is a promising type of activity in Ukraine. The creation of computer games as a type of economic activity has not become widespread, and in the general structure of the IT industry, only 1,097 business entities are engaged in it, which is less than one percent in percentage terms (Figure 1).

A common type of activity in the Ukrainian IT sector is the provision of information services, including data processing, posting information on websites and related activities, development and support of web portals, and provision of other information services. This field of activity occupies 19% in the structure of the IT industry, and in 2023 it employed 58,479 enterprises (including individual entrepreneurs).

The share of the segment of production of computers, electronic and optical products, electronic components and boards, production of computers and peripheral equipment, production of communication equipment in the structure of the IT industry in Ukraine is insignificant, namely 1%. We attribute this to the high costs of conducting these types of activities, which leads to an increase in the cost of manufactured products. High-value domestic products cannot compete with cheaper foreign analogues.

In general, the IT industry in Ukraine demonstrates a growth trend, which is primarily confirmed by the growth in the number of service providers and manufacturers of goods in this segment (Figure 2).

Over the 10-year analyzed period, the number of providers of computer programming, consulting and related activities increased by 2.94 times, the number of computer game manufacturers increased by 1.78 times, and the number of business entities providing information services increased by 2.98 times. Such statistical data allow us to state that the IT industry in Ukraine is a developing sector of the economy.

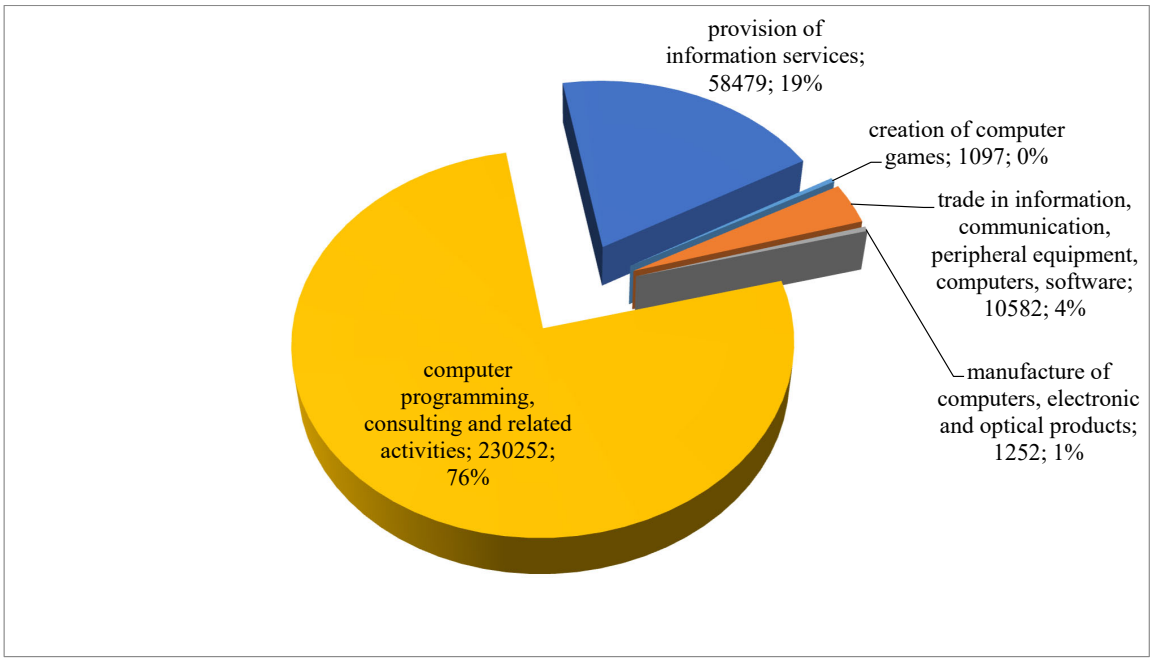

Figure 1. Structure of providers of services and goods in the IT sector in Ukraine in 2023 by types of economic activity, units

Source: compiled by the author based on data from the State Statistics Service of Ukraine (State Statistics Service of Ukraine, 2024)

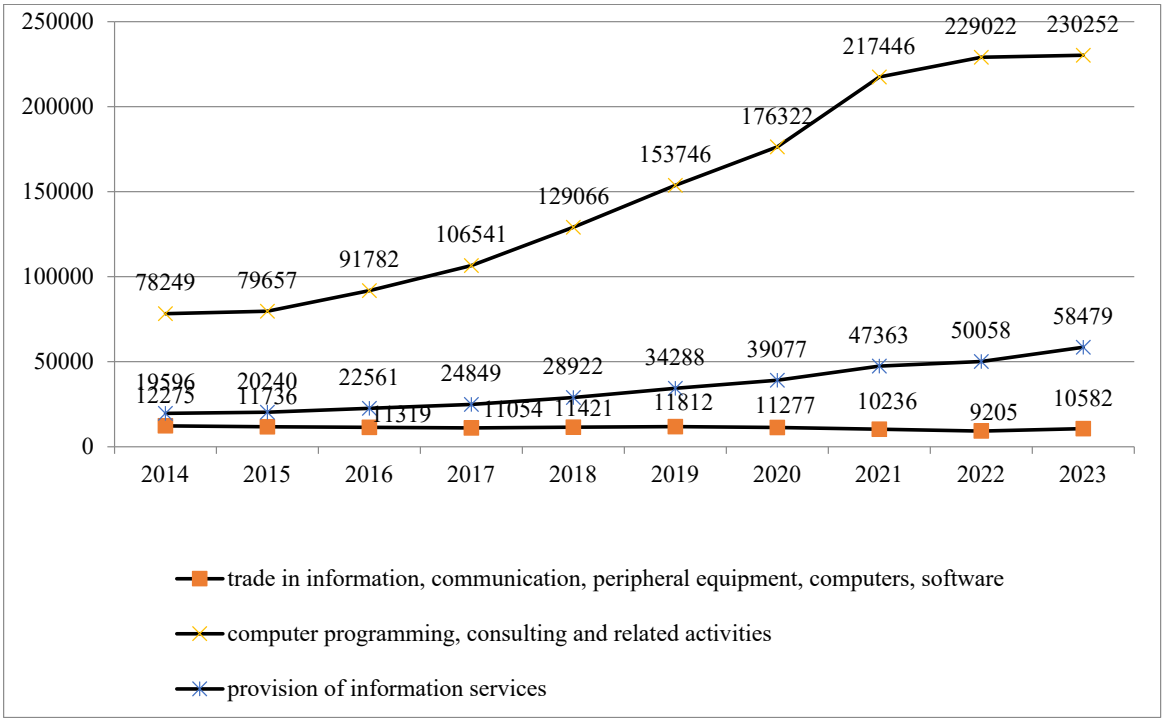

Figure 2. Dynamics of the number of providers of goods and services in the IT industry in Ukraine (by type of economic activity) during 2014-2023, units

Source: compiled by the author based on data from the State Statistics Service of Ukraine (State Statistics Service of Ukraine, 2024)

The segment production of computers, electronic and optical products, peripheral equipment, and the production of communication equipment is practically unchanged during of the analyzed period. The segment of the IT industry engaged in trade in information, communication, peripheral equipment, computers, and software shows minor fluctuations.

Analysis of Ukraine's IT services exports ($3.21 billion for the first half of 2024) showed a 5% decrease in the first half of 2024 compared to the same period in 2023. The importance of inclusive development of the IT industry in Ukraine is reinforced by the fact that the IT industry is the second sector of the economy in terms of the amount of exported products (after the agro-industrial complex). IT industry exports account for 11.5% of the total exports of the Ukrainian economy and almost 38% of the total exports of services (Kutsyk et al., 2024).

At the same time, a full-scale war, a global recession, and difficulties in crossing borders for business trips of IT specialists caused a decrease in the volume of exports of IT goods and services. During the first half of 2024, the 50 largest Ukrainian IT companies hired 5.5 thousand new specialists, but this may be due to the departure of some IT specialists abroad. The total number of specialists working in the 50 largest IT companies in Ukraine as of July 2024 is 80.5 thousand. In the first half of the year, it decreased by 1.2 thousand, or 1.5%. Despite the hiring of a significant number of specialists, the number of IT specialists is decreasing, the rate of outflow began to slow down in the summer of 2023, but the outflow of personnel from the IT industry of Ukraine continues (DOU platform, 2024).

3.3. Accessibility of Information Technologies for Ukrainian Society

Approximately 80% of Ukrainian citizens used the Internet daily in 2024. This indicates a high level penetration of digital technologies into the daily lives of Ukrainians. A significant part of users actively interacts with state electronic services. According to the open results of a survey of Ukrainians, 64% of citizens reported that they received such services online over the past year, and almost 80% of them assessed their experience as positive. Such results have a positive impact on the level of inclusive development of the IT industry in Ukraine. In general, the course of digitalization chosen by Ukraine is a significant factor in the inclusive development of the IT sphere. The inclusiveness of state online resources continues to grow. According to the results of 2023, 23% of official websites of state authorities reached a sufficient and high level of accessibility for people with hearing, vision, and musculoskeletal disorders. Compared to 2021, we observe an increase in this indicator by 9%, which is reflected in the results of

the annual monitoring of basic website accessibility conducted by the United Nations Development Program (UNDP) in Ukraine in partnership with the Ministry of Digital Transformation of Ukraine (Ministry of Digital Transformation of Ukraine, 2025).

The assessment of the inclusiveness of government websites is carried out according to ten main criteria (sufficient text contrast; availability of alternative text for all images; accessibility of text for hyperlinks; text labels on all buttons; text labels of form fields; programmatic determination of the main language of the page; absence of errors in the page code; mechanism for quick transition to the main content of the page; keyboard focus marking; support for keyboard control etc.), the fulfillment of each of the criteria is estimated at 1 point. According to the total number of points, websites are classified into categories with low, medium and high levels of basic web accessibility (inclusivity) (Polikovska, 2024).

The most popular government online resource is the Diya (Government Services Online) portal and application, the number of users of which increased from 13% in 2020 to 51% at the beginning of October 2023 (Diya: Government services online, 2025). These data indicate the rapid development of the Internet market in Ukraine and the growing trust of citizens in digital services.

There are significant differences in the use of the Internet and government e-services among different age groups. In 2023, 89% of young people aged 18–29 used at least one government e-service, while among people aged 70 and older this figure was only 30%. 50% of older people use the Internet daily, and 30% do not use it at all. However, the older age category demonstrates positive dynamics: the share of regular Internet users increased from 32% in 2022 to 50% in 2023 (Analytical report, 2024).

According to the analytical report "Opinions and Views of the Ukrainian Population on Government Electronic Services" (2024), which was commissioned by the United Nations Development Program (UNDP) in Ukraine, the list of vulnerable categories in 2023 included the elderly (20.5%), people with disabilities (15% in 2023 and 10% in 2022) and internally displaced persons (14%, the same as in 2022), single parents/mothers (7%, as in 2022), parents of children with disabilities (5% in 2023 and 2.5% in 2022), veterans (3%, in 2022 it was 2%) (Analytical report, 2024). In 2023, the share of regular Internet users increased from 72% to 80%, and in terms of vulnerable categories of the population, the most Internet users are internally displaced persons, parents of children with disabilities, single parents, and veterans. Among these groups, 81–86% are regular IT users. The level of Internet use by people with disabilities is estimated at 76%. The least Internet users are the elderly – 50% use it daily, and 30% do not use it at all.

In the process of analyzing the inclusiveness of the IT industry in Ukraine, a trend of growth in the share of the population belonging to vulnerable categories is observed. Comparing the statistical reporting of 2021 and 2022, we observe that the share of vulnerable categories in the general population structure has increased from 34% to 45.5%. This increase can be explained by the increase in the share of internally displaced persons as a result of military operations in the territory of Ukraine, the increase in the number of mothers/fathers raising a child on their own, and the increase in the number of people with disabilities. There is a growing trend throughout 2023, when the vulnerable population increased to 52%, along with a significant increase in the share of people with disabilities (from 10% in 2022 to 15% in 2023), parents of children with disabilities (from 2.5% to 5%), and veterans (from 2% to 3%) (State Statistics Service of Ukraine, 2024; Analytical report, 2024). Statistical data cannot provide an answer to the reason for the increase in the share of people with disabilities, but it can be assumed that this is due to the increase in the number of people with disabilities as a result of direct participation in hostilities, injuries, and the acquisition of disabilities by civilians as a result of shelling of settlements.

3.4. Analysis of the Impact of the War on the Level of Inclusive Development of the IT Industry in Ukraine

The development of the IT industry of Ukraine is significantly influenced by many factors. One of the most significant factors in modern realities is the impact of a full-scale war and global economic challenges on this sector, which is reflected both in the loss of human capital and the need to quickly respond to certain events. In addition, analyzing the development of the IT industry, we note the following factors of influence: variability of tax policy, imperfection of legislation, reduction of the human resource potential of the domestic economy and the difficult economic situation caused by a full-scale war on the territory of Ukraine. There are works in the scientific literature that investigate the factor of tax instability associated with changes in tax policy. For example, from October 1, 2024, the State Tax Service of Ukraine canceled the simplified form of taxation for Internet providers registered as individual entrepreneurs. As a result of this decision, almost a third of Internet providers that provided Internet connections (small businesses) ceased their activities. A decrease in the number of Internet providers may cause an increase in the cost of Internet access services due to a decrease in the level of competition.

Let's analyze the number of subscribers of the largest mobile operators in the IT industry in Ukraine as one of the indicators of the inclusiveness of society's

access to the mobile Internet. In general, the sphere of telecommunications services in the structure of the IT industry is characterized by high rates of development and the need to quickly respond to changes and new trends, in particular the implementation of digital transformation and innovative technologies, the use of artificial intelligence, increasing competition, and the development of new business models focused on inclusive development. The sphere of telecommunications services in Ukraine demonstrates growth trends. An assessment of the activities of leading telecommunications companies in Ukraine revealed that the largest service providers in Ukraine are Kyivstar PJSC (23.9 million users in 2023), VF Ukraine PJSC (15.9 million users in 2023), and Lifecell LLC (9.9 million users in 2023). Despite difficult operating conditions, namely: destruction of infrastructure, frequent power outages, subscriber migration, and reduced user solvency, IT communication companies demonstrate the ability to adapt, recover, and modernize (Galan and Smolyar, 2022; Sazonova and Shmaliy, 2023; Syaska, 2024).

In Ukraine, the number of initiatives aimed at integrating people with disabilities into the IT sector is increasing. For example, the Lviv social enterprise "Inclusive IT" has been training and employing people with disabilities, including those with visual impairments, since 2017. The company's employees test websites for web accessibility, ensuring their convenience for all users. In addition, large IT companies conduct educational programs on digital accessibility, involving hundreds of students and teachers from different cities of Ukraine. These events help raise awareness of the importance of inclusion and create opportunities for employment of people with disabilities in the IT sector. Accurate statistics on the number of people with disabilities employed in the IT industry in Ukraine are limited. Each case of employment of a person with special needs is considered individually, and the company provides the necessary conditions for comfortable work, including barrier-free access to offices and special software.

In general, the development of the IT industry will be facilitated by the following factors: a balanced tax policy, the development of a favorable legal environment and the implementation of reforms aimed at stimulating the IT industry in Ukraine. When these factors are favorable, this will allow strengthening the Ukrainian IT industry, will contribute to the growth of the IT industry in the long term and an increase in the level of inclusive development of the IT industry in Ukraine.

4. Discussion

This study is aimed at analyzing the inclusive development of the IT industry in Ukraine. The structure and dynamics of the IT industry market entities were considered. In the process of analysis, aspects of the accessibility of Internet technologies for the population, problems in using IT services for vulnerable categories of society were revealed.

Prospects for future research include deepening the methodological principles of assessing the level of inclusive development of the IT industry in Ukraine and an in-depth study of factors influencing the inclusiveness of this industry. In addition, it is important to study the world experience of promoting inclusive development of the IT sector.

5. Conclusion

Inclusive development of the IT sector is an important component of the Digital Transformation Strategy of Ukraine, which aims to develop an inclusive, accessible and effective social sphere in Ukraine through the integration of digital technologies and innovations. However, it is necessary to take a comprehensive approach to the issue of inclusive development of the IT industry in Ukraine and ensure constant dialogue between state bodies, business entities in the IT industry and society. Cooperation and discussion of key issues will become the basis for making informed decisions to ensure an increase in the level of inclusive development of the IT industry in Ukraine. This dialogue should contribute to taking into account the interests of all stakeholders, especially vulnerable categories of society. The development of the IT sector, despite military actions and with the involvement of vulnerable segments of the population, and taking into account the interests of such segments, is the basis for the further development of the Ukrainian economy and society.

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