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DOI: https://doi.org/10.34069/AI/2024.81.09.6
How to Cite:
Tyshchenko, V., Bielousov, Y., Yemets, V., Borodenko, T., & Beder, D. (2024). The impact of digital transformation on the development of post-war regions of Ukraine. *Amazonia Investiga*, *13*(81), 86-97. https://doi.org/10.34069/AI/2024.81.09.6

The impact of digital transformation on the development of post-war regions of Ukraine

Вплив цифрової трансформації на розвиток повоєнних регіонів України

Received: July 1, 2024 Accepted: September 15, 2024

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Abstract

The relevance of the topic of studying the impact of digital transformation on the development of post-war regions of Ukraine is due to the need to improve the economic and social structures of these regions in the current changing environment. In this context, the study aims to identify the potential of digital technologies to support processes in business, education, healthcare and infrastructure, which will help increase competitiveness and ensure the development of these territories. To achieve the main goal, general scientific methods such as analysis, synthesis, induction and deduction were used to study the state of the digital economy and digital transformation of Ukraine's regions, as well as to assess the current state of the country's economy and trade. The results of the study confirm that digital transformation has a significant impact on the development of Ukraine's post-war regions,

Анотація

Актуальність теми дослідження впливу цифрової трансформації на розвиток повоєнних регіонів України зумовлена необхідністю вдосконалення економічних і соціальних структур цих регіонів у нинішніх мінливих умовах. У цьому контексті дослідження спрямоване на виявлення потенціалу цифрових технологій для підтримки процесів у сфері бізнесу, освіти, медицини та інфраструктури, що сприятиме збільшенню конкурентоспроможності та забезпеченню розвитку цих територій. Для досягнення основної мети використовувалися загальнонаукові методи, такі як аналіз, синтез, індукція та дедукція, що сприяли вивченню стану цифрової економіки та цифрової трансформації регіонів України, а також оцінці сучасного стану економіки та торгівлі країни. Результати дослідження підтверджують, що

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providing them with new opportunities for economic recovery and social growth. Thus, from 2019 to 2022, the export of IT services increased by 400 million US dollars, which indicates the importance of this sector. Despite a 10% decline in IT services exports in 2023 due to the war, the industry remains critically important to the country's economy. Trade deficits caused by restrictions on agricultural exports and blockades of sea routes can be partly solved by digital technologies that help develop new markets. The use of digital tools in education increases the level of professional skills of the population, and the IT sector continues to attract investments, creating new jobs. Digital technologies also increase the efficiency of infrastructure reconstruction, which contributes to the rapid recovery of regions. Thus, digital transformation is a key catalyst for the development of Ukraine's post-war regions, facilitating their integration into the European socio-economic space and improving the overall living standards of the population. The introduction of digital innovations helps to reduce the gap between the regions and national and global development standards, creating the preconditions for sustainable economic growth and social stability.

Keywords: decentralised systems, cryptocurrency, regulatory aspects, fintech innovations, digital identity, cybersecurity.

цифрова трансформація має значний вплив на розвиток повоєнних регіонів України, забезпечуючи їм нові можливості для економічного відновлення та соціального зростання. Так, з 2019 по 2022 рік експорт IT-послуг зріс на 400 млн доларів США, що свідчить про важливість цього сектора. Попри зниження експорту IT-послуг на 10% у 2023 році через війну, галузь залишається критично важливою для економіки країни. Торговельний дефіцит, спричинений обмеженням експорту агропродукції та блокуванням морських шляхів, може бути частково вирішений завдяки цифровим технологіям, які допомагають розвивати нові ринки збуту. Використання цифрових інструментів в освіті підвищує рівень професійних навичок населення, а IT-сектор продовжує залучати інвестиції, створюючи нові робочі місця. Цифрові технології також підвищують ефективність відбудови інфраструктури, що сприяє швидкому відновленню регіонів. Таким чином, цифрова трансформація – ключовий каталізатор розвитку повоєнних регіонів України, що сприяє їх інтеграції в європейський соціально-економічний простір і підвищенню загального рівня життя населення. Впровадження цифрових інновацій дозволяє зменшити відставання регіонів із загальноукраїнськими та світовими стандартами розвитку, створюючи передумови для сталого економічного зростання та соціальної стабільності.

Ключові слова: децентралізовані системи, криптовалюта, регуляторні аспекти, фінтех-інновації, цифрова ідентичність, кібербезпека.

Introduction

In today's world, digital transformation plays a key role in the development of the economy and society, especially in the context of post-war regions. Today, Ukraine needs this transformation more than ever. Digital technologies open up new opportunities in the areas of economy, education, healthcare and infrastructure for regions affected by the war. The introduction of digital innovations increases the competitiveness of regions in the international market, which helps to attract investment and improve the living standards of the local population.

At the same time, it is important to consider not only the positive aspects of digital transformation, but also possible challenges, such as digital inequality and price instability. Nevertheless, it can be argued that the introduction of digital technologies is an integral part of the development of Ukraine's post-war regions, aimed at ensuring sustainable growth and inclusive development of society.

Digitalisation, the digital economy and digital transformation are key terms in the modern world that reflect the transition to new digital realities in all aspects of life, business and the economy. In the modern digital era, countries are actively competing not only in the economy but also in technology, thus creating a new paradigm of global power dynamics (Zhukovska et al., 2023). Artificial intelligence, advanced technologies, digital transformation - these areas can radically change modern society in the near future (Ivankov et al., 2023). Artificial intelligence is gradually occupying its unique niche in the modern world (Silvia, 2023).

Digitalisation is considered to be a key factor in economic growth, as it can positively affect the efficiency, productivity, cost-effectiveness and quality of government policy (Sosnin, 2020). In English, digitalisation is the introduction of digital technologies into all aspects of life: from interpersonal interaction to industrial processes, from household items to children's toys and clothing. This process involves the transition from traditional biological and physical systems to the integration of physical and computational components into cyber-biological and cyber-physical systems. Transition of activities from the real world to the virtual world (online) (Haustova, 2022). Digitalisation is an undeniable driver of the development of modern society and all its components (Kravchuk et al., 2023). It opens up significant opportunities for the labour market and economic growth.

The digitalisation of Ukraine's economy is a process of active implementation of advanced digital technologies and innovations to improve the country's competitiveness and promote its development. The digital economy offers many benefits. Digital technologies are a mechanism of social lifts. They stimulate social progress by increasing citizen engagement and improving the accessibility and quality of public and social services, including healthcare, education and culture. For example, it is now easy to make an appointment with a doctor online and monitor your health using advanced medical technologies (Cherep & Sarbej, 2023).

As Cherep & Sarbej (2023) rightly point out, digitalisation is not only a modern trend, but also an important tool in the recovery of Ukraine's economy after the war. The introduction of digital technologies in various spheres of life and business is becoming a catalyst for effective economic recovery. The authors highlight the following key aspects:

- Reforming social sectors. Digital tools are helping to modernise the healthcare and education sectors. Innovations in e-health and distance learning allow for faster adaptation to new conditions and provide access to critical services;
- Digital platforms for recovery. Creating digital platforms for coordinating and financing recovery projects makes the recovery process more transparent and efficient. It facilitates monitoring by both the government and the public;
- Development of the military-tech industry. Innovative solutions in the military sphere not only strengthen the country's security but also contribute to overall technological development. The creation of a defence technology agency and accelerator is an important step in this direction.

Let us also emphasize that the Ukrainian-Russian war, which began in February 2022, caused significant damage to the economy and infrastructure of Ukraine, especially in the affected regions. The destruction of residential buildings, industrial enterprises and social facilities created an urgent need for rapid reconstruction and modernization. In this context, digital transformation plays a key role, as the introduction of the latest technologies contributes to effective reconstruction, improving the quality of public services and attracting investments. It also opens up new opportunities for long-term development and growth of the country's competitiveness.

Literature Review

The implementation of digital technologies in various spheres of life and business is becoming an important factor for effective economic recovery. First, digital tools are helping to reform affected industries such as medicine and education. Innovative solutions in e-health and distance learning allow for faster adaptation to new conditions and provide access to important services, which is critical in wartime conditions. Secondly, the creation of digital platforms for attracting financial support and coordinating restoration projects makes the restoration process more transparent and efficient. This increases the possibility of monitoring by both the government and the public, which promotes confidence in recovery efforts. Thirdly, the development of the military-tech industry and the implementation of innovative solutions in this area is an important step for ensuring national security. The creation of a defense technology agency and accelerator will not only strengthen the military, but also stimulate overall technological progress (Cherep & Sarbej, 2023).

Pichkurova (2023) emphasizes that the war in Ukraine revealed a number of problems that can be partially or completely solved with the help of digital tools. Among the examples of this is the organization of the termination of the activities of enterprises and their relocation from temporarily occupied territories through digital platforms. Migration problems of the working population are also solved thanks to the possibility of

conducting business abroad with remote registration of all bureaucratic procedures in Ukraine. In addition, digital platforms are being used to capture housing destruction, change logistics strategies for businesses, and combat cyber threats targeting government agencies and critical infrastructure. Digitization in wartime also helps fight corruption by digitizing public services, which reduces the impact of the human factor.

Tulchynska & Dergalyuk (2022) note that the impact of digitalisation on the activation of the regions' potential is carried out through the following mechanisms:

- Improving the efficiency of research and innovation activities and innovative development of regional economic systems. Digital technologies help to accelerate innovation processes and reduce research and development costs, which contributes to the growth of regional competitiveness;
- Intensifying the attraction of investment resources. Digital technologies are creating new opportunities for attracting foreign investment in regional economic sectors, which contributes to their development and modernisation;
- Improving the quality of social services and attracting investment capital to implement social programmes. Digital technologies make it possible to optimise social programmes and increase their efficiency, as well as attract investment for their implementation;
- Increase the level of economic security and resilience of the regions. Digital tools help manage risks and reduce the vulnerability of regions to economic fluctuations and global trends;
- Increasing the competitiveness of the environment. The use of digital technologies enables productivity growth and optimisation of production processes, which in turn increases the region's competitiveness;
- Optimisation and automation of economic regulation processes. Digital tools simplify administrative procedures and improve the efficiency of public administration and regulation of economic processes.

Today, digital transformation is a key factor in ensuring sustainable and long-term economic growth in the post-war regions of Ukraine (Bezrukova et al., 2022).

In a broad sense, digital transformation is an irreversible process that encompasses the introduction of digital technologies in all spheres of life, business, society and the state in order to improve efficiency, innovation and competitiveness (Strutynska, 2019; Tsekhmister et al., 2021). This process reflects the transition to a digital economy, where new opportunities and challenges require constant adaptive response and development. According to a number of scholars (Kovalevska et al., 2022), digital transformation is a productivity growth. The introduction of digital technologies allows us to optimise production and service processes, which leads to increased productivity:

- Improved access to markets. Digital technologies make it easier for regional businesses to enter new markets and conduct marketing and sales via the Internet, which increases their competitiveness;
- Development of innovations. Digital technologies are driving innovation in regional businesses, enabling them to create new products and services that meet modern consumer demands;
- Attracting investment. Regions that are actively implementing digital solutions are able to attract more investment, as their business ecosystems are characterised by a high-tech focus;
- Improving the quality of life. The introduction of digital technologies in education, healthcare, transport and other sectors improves the quality of life of regional residents by providing more convenient and efficient services;
- Reducing environmental impact. Digital innovation can help reduce environmental impact through energy optimisation, waste management and other environmentally friendly practices;
- Support for urbanisation. Digital technologies contribute to the development of modern urban systems, which is important for the effective management of large concentrations of people.

Grazhevska & Chygyrinsky (2021) identify the following negative consequences of the digital transformation of the economy:

- Polarisation of the workforce by the level of digital skills. The introduction of digital technologies may widen the gaps between those with high digital skills and those with low skills. This can lead to risks associated with the insufficient matching of quality educational and professional knowledge with the requirements and needs of the labour market;
- Deepening social polarisation. The introduction of digital technologies may increase the level of social inequality. This includes narrowing opportunities for the middle class, blocking social lifts, and

regressive social mobility. That is, certain groups of the population may remain excluded from the opportunities offered by the digital economy;

– Social and psychological problems. The emergence of digital technologies can lead to social and psychological problems, such as the threat of segregation of the population by the level of their competence in digital technologies. This can impair the functionality and labour skills of staff, as well as change their motivational orientations.

Thus, digital transformation has a strong impact on the development of our country's regions, providing new opportunities to modernise infrastructure, improve the efficiency of public and administrative services, stimulate innovation and attract investment.

It should be noted that most modern scholars study the overall impact of digital transformation on the development of Ukraine's regions. In this study, we will focus more on the development of Ukraine's post-war regions, as this topic is particularly relevant and has great potential to improve the qualitative and quantitative development of the country as a whole. Ukraine's post-war regions face a variety of challenges, including restoration of infrastructure and socio-economic rehabilitation of the population, stimulation of investment and development of innovative industries, etc. Digital transformation can play a key role in addressing these challenges by providing access to modern technologies, increasing the efficiency of administrative and public services, helping to create new jobs and improving the living conditions of residents. This approach will significantly increase the competitiveness of the regions and the overall level of development of Ukraine.

Methodology

The main parts of the study include a detailed analysis of the current state of infrastructure and economic indicators in the regions (gross domestic product of Ukraine (GDP), real GDP of Ukraine, the share of the digital economy in GDP, the digital transformation index of the regions of Ukraine, the dynamics of IT exports of Ukraine), which allows to determine strategies their further recovery and development.

The research is based on general scientific methods, such as analysis (to identify trends and regularities in the development of regions), synthesis (to integrate various types of data in order to form a comprehensive vision of the state of the region), induction (helps to identify new patterns) and deduction (allows to verify already known theories in the context of specific conditions of Ukraine), which contributed to the study of the digital economy and digital transformation of the regions of Ukraine, as well as the assessment of the current state of the country's economy and trade.

In the course of the research, we used data from the State Statistics Service of Ukraine, as well as the results of research conducted by independent analytical centers that focus on digital transformation, the development of the IT sector and its contribution to the economy of Ukraine. These sources of data and methods of analysis allow for a systematic approach to studying the impact of digital transformation on the development of post-war regions of Ukraine, which, in turn, contributes to the well-founded formulation of recommendations for their recovery and development.

Results and Discussion

The current economic environment is characterised by accelerating globalisation and integration, as well as escalating conflicts in various parts of the world. These challenges create high uncertainty, which complicates economic policy-making and development. These challenges are particularly acute for Ukraine, which has been the target of military aggression by the Russian Federation since 24 February 2022. Nevertheless, it is necessary to identify areas for developing strategies and mechanisms for the reproduction and development of the country's economy even before the end of the conflict to ensure sustainability and future development in the face of global change (Bozhkova & Halytsia, 2022). The turn of the twentieth and twenty-first centuries was a period of dramatic changes in the information space in general, which was reflected in the conceptual formation of a new information society (Kryvoshein, 2023). The digitalisation of the Ukrainian economy, which began to develop actively during the COVID-19 pandemic, has become crucial in the context of the war, becoming one of the priorities for Ukraine's economic development and opening up prospects for the country's transformation into one of the global leaders in the digital space. Statistics show that the share of the digital economy in Ukraine's GDP is

gradually increasing. For example, while in 2019 the share of the digital economy in Ukraine's GDP was only 4.3%, by the end of 2023 it was 6%. This figure is forecast to rise to 7.7% by the end of 2024.

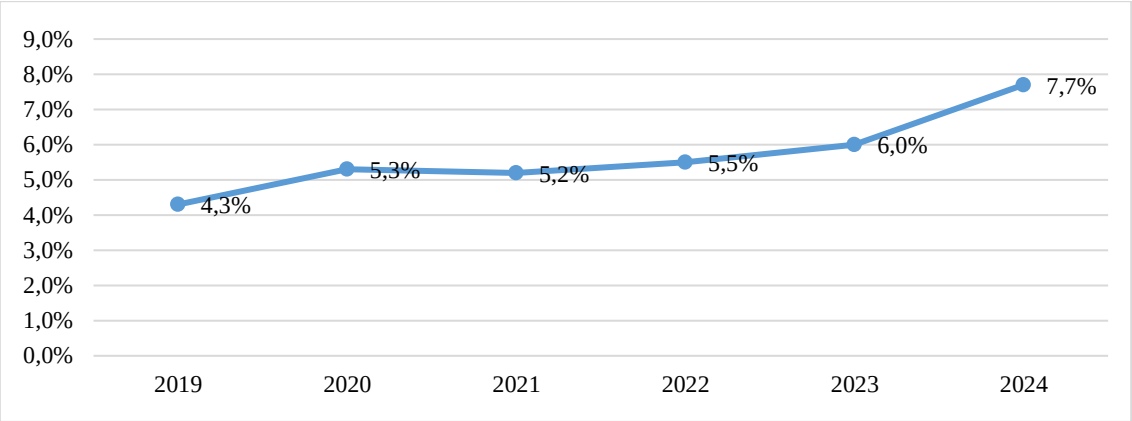

Figure 1. Share of the digital economy in GDP, %.
Source: compiled by the authors based on (Project of the Recovery Plan of Ukraine, 2023)

The digital transformation of industries leads to changes in demand and factors of production, which causes the transformation of both individual industries and the entire structure of the economy and inter-sectoral interaction under the influence of digital technologies. Fig. 2 shows the average annual values of the additional contribution of growth factors to the value added of economic sectors as a result of digitalisation. We can see that the share of the digital economy in Ukraine's GDP is almost 4.0%, which indicates its growing importance as an integral part of the country's economy. Digitalisation has a significant impact on the economic development of sectors of the Ukrainian economy. Different sectors demonstrate different levels of contribution to value added through digital technologies. Sectors that actively use digital innovations, such as finance and transport, show significant positive changes in productivity. At the same time, there are sectors that face challenges in adapting to digital transformation, such as timber and metallurgy.

Today, during the full-scale war initiated by Russia against Ukraine, digital transformation has become more relevant to improve cybersecurity, ensure uninterrupted access to medical and educational services, and ensure the normal functioning of the country's infrastructure. Even in the face of the current challenges, new services and projects have been developed, such as eVorog and eOselya, which allow for the registration of damaged property and the payment of social benefits to internally displaced persons and the unemployed (Ivanova, 2022).

Additionally, the Ministry of Digital Transformation of Ukraine has developed the Digital Transformation Index of Regions, which is a key tool for measuring the processes of informatisation and digitalisation in the regions and allows assessing the capacity of authorities to implement digital solutions, as well as determines the level of digital culture among the citizens of our country (Rogozyan & Vakhlakovi, 2023).

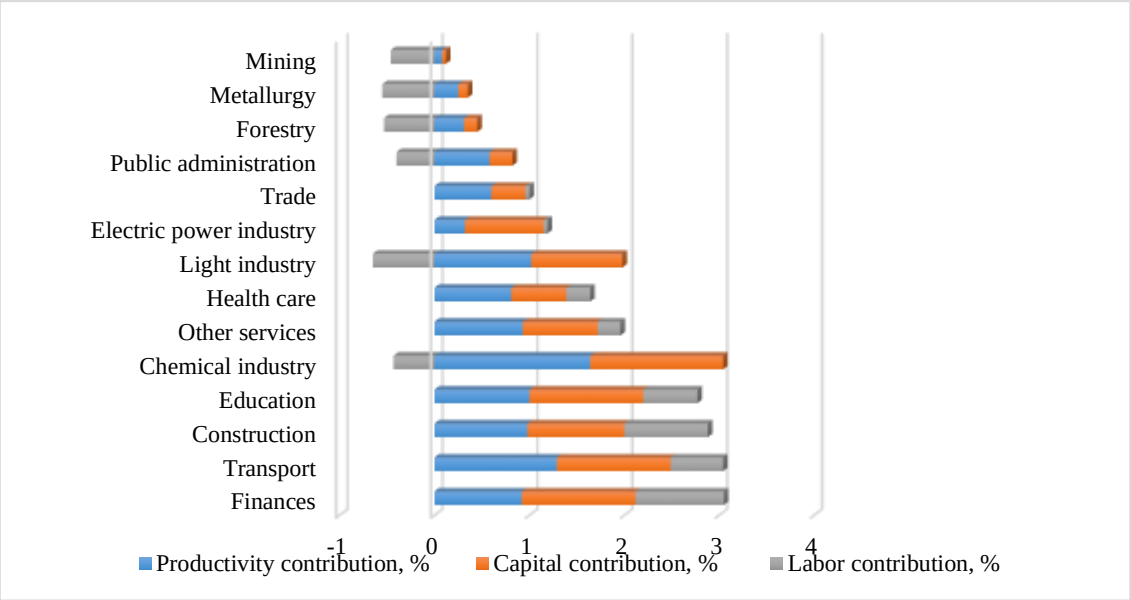

Fig. 2. Average annual values of the additional contribution of growth factors to the value added of economic sectors as a result of digitalisation in 2019-2030.
Source: compiled by the author according to (National Institute for Strategic Studies, 2023)

It is worth noting that in 2023, the average score of the Digital Transformation Index was 0.632 (Fig. 3).

The highest values of the index were recorded in Dnipro region (0.908), Lviv region (0.891), and Poltava region (0.833). Some regions showed positive dynamics in improving this indicator.

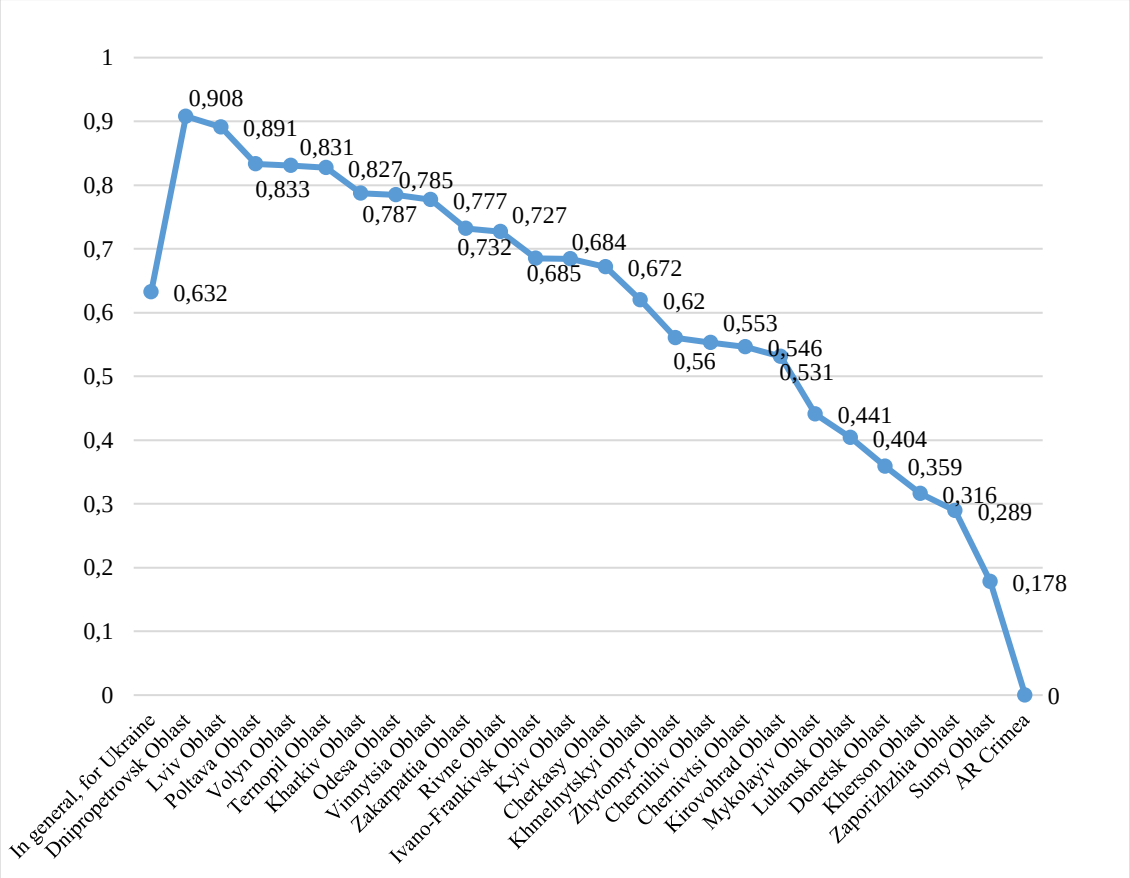

Fig. 3. Indicators of the Digital Transformation Index of Ukrainian regions in 2023.
Source: compiled by the author based on data from the Ministry of Digital Transformation of Ukraine (2023)

In 2023, the Digital Transformation Index contained 8 sub-indices (Table 1).

Table 1.
Index of Digital Transformation of Ukrainian Regions in 2023 by sub-indices

	Institutional capacity	Development of the Internet	Development of ASCs	Paperless mode	Digital education	Business card of the region	Basic e-services	Sectoral DH
Vinnytsia	0.9	0.784	0.712	0.868	0.92	0.6	0.551	0.848
Volynska	0.88	0.87	0.808	0.865	0.624	0.9	0.947	0.747
Dnipro Petrovska	1	0.902	0.908	0.923	0.968	1	0.901	0.826
Donetsk	0.32	0.118	0.369	0.605	0.546	0.6	0.569	0.272
Zhytomyrska	0.38	0.769	0.515	0.743	0.552	0.1	0.566	0.511
Transcarpathian	0.8	0.602	0.683	0.813	0.82	1	0.847	0.688
Zaporizhzhya	0.598	0.185	0.432	0.141	0.658	0.05	0.428	0.065
Ivano-Frankivsk	0.9	0.769	0.643	0.599	0.24	0.6	0.61	0.69
Kyiv	0.685	0.689	0.744	0.718	0.542	1	0.728	0.534
Kirovohradska	0.32	0.619	0.589	0.622	0.524	0.5	0.528	0.454
Lviv	0.88	0.914	0.905	0.951	0.84	0.6	0.885	0.918
Mykolaivska	0.167	0.609	0.51	0.487	0.656	0.9	0.534	0.105
Odesa	1	0.849	0.706	0.819	0.62	1	0.904	0.601
Poltava	0.8	0.917	0.709	0.902	0.936	1	0.738	836
Rivne	0.96	0.609	0.653	0.853	0.472	1	0.733	0.732
Sumy	0.3	0.173	0.066	0.182	0.398	0	0.416	0.104
Ternopilska	1	0.916	0.747	0.856	0.732	1	0.672	0.773
Kharkivska	0.728	0.926	0.696	0.809	0.968	0.5	0.809	0.773
Kherson	0.286	0.179	0.383	0.612	0.834	0.5	0.286	0.092
Khmelnytska	0.8	0.756	0.504	0.667	0.458	0.1	0.664	0.637
Cherkassy	0.656	0.595	0.711	0.731	0.686	0.5	0.687	0.719
Chernivetska	0.5	0.374	0.733	0.74	0.546	0.5	0.589	0.447
Chernihivska	0.612	0.404	0.63	0.536	0.546	0.6	0.72	0.509

Source: compiled by the author based on data from the Ministry of Digital Transformation of Ukraine (2023)

The Digital Transformation Index of Ukraine's Regions in 2023 shows significant variations in the level of digital readiness of the country's regions. The leaders in terms of the overall level of digital transformation are Dnipro, Ivano-Frankivsk, and Odesa regions, which have shown high results in most sub-indices. While these regions have made significant progress in Internet development, digital education, and the introduction of e-services (Donetsk and Sumy regions), they remain far behind. This demonstrates the need for targeted government policy and investment in digital technologies for the balanced development of all regions of Ukraine.

In order to understand the possible development options for the post-war regions of Ukraine, it is important to first assess the current state of the Ukrainian economy. In this study, we will look at two main areas: the economy and trade.

In the first year of the war, the economic and social situation in Ukraine deteriorated significantly, which had a negative impact on the business environment. Thus, according to the State Statistics Service of Ukraine, real GDP decreased by 29.1% in 2022, which was the deepest decline in the history of Ukraine's independence. At the prices of the previous year, excluding inflation, GDP amounted to UAH 3.86 trillion, compared to UAH 5.45 trillion in the previous 2021 (Table 2).

Table 2.
Gross domestic product of Ukraine in 2022 (trillion UAH)

Period	Nominal GDP (in actual prices)	Real GDP (in 2021 prices)	Difference (real - nominal)	
Q1.			-0.15	-13.4%
II quarter.	1.03	0.78	-0.25	-24.1%
III quarter.	1.45	1.08	-0.37	-25.6%
IV quarter.	1.62	1.06	-0.56	-34.4%
for the year	5.19	3.86	-1.32	-25.5%

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

The decline in real GDP was quite significant (Figure 4). However, this decline was smaller than expected at the beginning of the invasion, thanks to the high adaptability of businesses and households, as well as the resilience of the energy system.

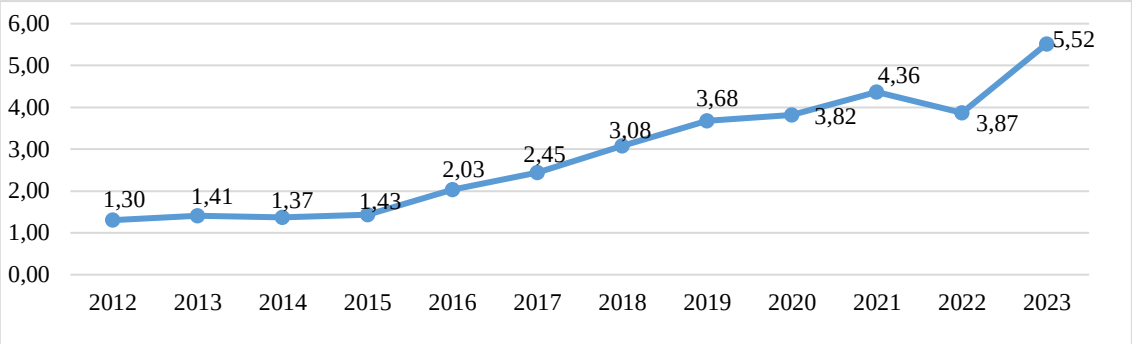

Figure 4. Real GDP of Ukraine from 2012 to 2023 (trillion UAH)
Source: built by the author according to (UNIAN Information Agency, 2022)

Ukraine's industrial complex continues to be the main core of the country's GDP generation (Voloshina-Sijdei et al., 2023). Overall economic activity has declined by 30-50%. The political and economic situation in Ukraine has led to an increased likelihood of crisis phenomena at enterprises, which is manifested in lower financial results or even losses, reduced financial stability and production volumes, and deterioration in the quality of services and products (Mukhalchenko et al., 2023). Approximately 30% of employees were displaced, leading to staff shortages in some regions and sectors. Infrastructure, civilian housing and social institutions also suffered significant losses.

Trade in Ukraine also faced significant challenges during the conflict. The blockade of the sea route by Russia, which was our country's largest trade channel, has led to a significant reduction in export opportunities. Currently, only agricultural products are being exported, and it is too early to talk about a recovery in exports.

Ukraine continues to trade through the EU, but the throughput is critically low and limited mainly to land. This leads to an accumulation of trade deficits, as imports are 80-90% of the previous military level, while exports have declined significantly. At the same time, it is important to note that in 2019-2022, IT exports showed steady growth. Although the growth rate was the lowest in the first year of the war, at only 5.8%, the volume of IT exports increased by almost USD 400 million. The volume of IT exports increased by almost USD 400 million (Figure 5).

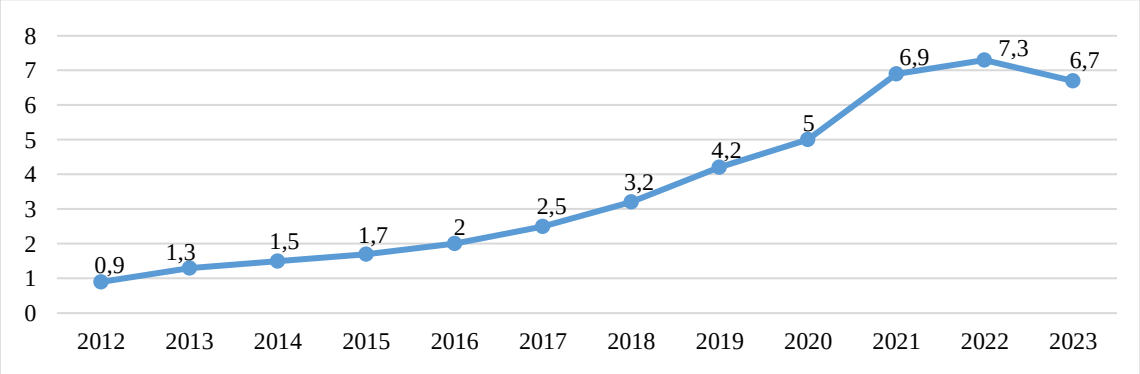

Figure 5. Dynamics of Ukraine's IT exports in 2012-2022.
Source: compiled by the author according to (Community of DOU programmers, 2023)

In 2023, Ukraine's exports of IT services recorded a year-on-year decline for the first time, indicating a significant downward trend in market size. As domestic demand for IT services is limited, this drop of almost 10% indicates the significant challenges facing the Ukrainian IT sector in the current environment. The IT industry in Ukraine is an important component of the country's economic base, so immediate action is needed to curb this decline and introduce additional tools to stimulate its development and exports.

The reconstruction of Ukraine's post-war regions promises to be one of the largest projects of its kind in Europe since the Second World War. The size of the reconstruction tasks and the capabilities of modern technologies create unique challenges and open up opportunities for creative approaches to address them. Therefore, it is now extremely important for Ukraine to use all available resources in the state and the

private sector efficiently, openly and transparently, and to intensify partnerships with all categories of international partners.

Shapoval et al., (2022) divided all recovery processes into three groups:

- **Systematisation of recovery**. This includes the creation of a unified system for the distribution and accounting of recovery projects, project identification, prioritisation, selection of contractors, as well as accounting and control of processes;
- **Resource** allocation. This includes the distribution of state property (corporate rights, real estate, mineral resources, land, forests, etc.), concessions, public-private partnerships and project financing for new construction, modernisation and reconstruction, non-financial assistance (reconstruction goods, energy), distribution of confiscated Russian property, humanitarian aid and social support, compensation for damage and lost profits;
- **Export promotion**. This includes exporting products to the EU, for example, on a pickup basis, and creating new exchanges for Ukrainian products, such as agricultural products in the Black Sea.

Digital transformation has the potential to significantly improve the development of Ukraine's post-war regions in several key ways:

1. **Effective resource management.** The introduction of digital technologies will allow for more effective recovery management, including systems for monitoring and analysing data on resource allocation, project planning and monitoring.
2. **Digital infrastructures and connectivity.** The development of digital infrastructures and improved access to high-speed Internet will facilitate the integration of post-war regions into the global economic system, promoting new opportunities for businesses and the economy as a whole.
3. **Education**. Digital technologies can improve access to education and improve the skills of the population of post-war regions through distance learning, online courses and other forms of education that allow them to adapt to modern labour market requirements.

The development of Internet technologies is facilitating the creation of new forms of information exchange. To this end, new dynamic e-learning platforms are being created to replace traditional ones. In particular, the use of technology for training specialists is gaining popularity due to the widespread introduction of e-learning using the Internet and various electronic tools (Aljad, 2023).

4. **Digital tools for business**. The introduction of digital tools will help local businesses improve production efficiency, increase competitiveness, and develop new sectors of the economy, such as IT, e-commerce, etc.

Thus, the recovery and development of Ukraine's post-war regions requires the effective use of digital tools that will allow for the country's rapid and efficient reconstruction, reducing the risks of inefficient use of resources and possible manipulation. The introduction of these tools should complement and accompany the development process, promoting the implementation of best practices in resource management at all levels of government. The most important aspect is to receive timely financial support from international partners, as investment in the restoration and development of Ukraine's regions is an important step towards ensuring security and economic stability in Europe and the world.

Conclusions

Digital transformation is having a significant impact on the development of Ukraine's post-war regions, providing them with new opportunities for economic recovery and social growth. The integration of digital technologies helps to improve access to education and healthcare services, which is key to improving the quality of life of the local population. Digital tools also help to attract investment and develop entrepreneurship, creating new jobs and contributing to economic stability. New technologies also help to increase the transparency of governance and reduce corruption, which is an important factor for the development of democracy and the rule of law. Thus, digital transformation is a key catalyst for the development of Ukraine's post-war regions, facilitating their integration into the European socio-economic space and improving the overall standard of living.

Limitations

The limitations of this study can be considered in the context of several key circumstances:

- Limited selection of sources. The selected sample consists of only 35 sources, which may limit the representativeness of the study and not take into account all possible opinions about the research topic. For greater credibility and objectivity of the research, a wider list of sources and approaches should be considered;
- The need for constant data updates. Given the rapid changes in today's economic and political environment, this analysis may become outdated within a short period of time.

To ensure the highest level of relevance and validity of data and results, it is necessary to constantly update and expand sources of information, as well as use new methods of research and data collection. Further scientific research can be directed to the thematic analysis of the impact of digital transformation on the development of specific post-war regions of Ukraine, which will allow identifying specific challenges and opportunities in each of them. This may include research into specific sectors such as IT, education and infrastructure, as well as case studies of successful implementation of digital technologies in reconstruction. In addition, a comparative analysis with other countries that have experienced similar conflicts will allow us to identify best practices and adapt them to the conditions of Ukraine.

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