Co-funded by the European Union

National Office Erasmus+UA
erasmusplus.org.ua

Collective monograph
Колективна монографія

EUROPEAN EXPERIENCE IN THE USE OF DIGITAL TECHNOLOGIES IN THE ECONOMY

ЄВРОПЕЙСЬКИЙ ДОСВІД ВИКОРИСТАННЯ ЦИФРОВИХ ТЕХНОЛОГІЙ В ЕКОНОМІЦІ

2025

UDC 33(082)
Eu600

Reviewers:

Okhrimenko Ihor Vitaliiovych – Doctor of Economic Sciences, Professor, Rector of the Kyiv Cooperative Institute of Business and Law;

Pulina Tetiana Veniaminivna – Doctor of Economic Sciences, Professor, Head of the Department of Management and Administration at National University «Zaporizhzhia Polytechnic»;

Stoliarov Vasyl Fedosiiovych – Doctor of Economic Sciences, Professor, Chief Researcher at the Financial Research Institute of the SERI «Academy of Financial Management»

Recommended by the decision of the Academic Council of Zaporizhzhia National University (protocol № 11 of 27.05.2025)

European experience in the use of digital technologies in the economy : collective monograph / edited by A. V. Cherep, I. M. Dashko, Yu. O. Ohrenych, O. H. Cherep, V. M. Helman. Riga, Latvia : Baltija Publishing, 2025. 326 p.

Eu600

ISBN 978-9934-26-581-5

DOI 10.30525/978-9934-26-581-5

The collective monograph is based on the results of research within the framework of the implementation of the project of the European Union Erasmus+ by Jean Monnet directly 101085727 – EU-DIGITIZATION – ERASMUS-JMO-2022-HEI-TCH-RSCH «Digitalization of the economy in the context of the Covid-19 pandemic as a strategic platform for economic development of the state» / «Цифровізація економіки в умовах пандемії Covid-19 як стратегічна платформа розвитку економіки держави» based on the Faculty of Economics Zaporizhzhia National University. The monograph is devoted to the disclosure of the theoretical foundations of the digitalization of the economy, the formation of methodological and practical recommendations for the implementation of the European experience of using digital technologies in the economy of Ukraine in the war and post-war period.

The collective monograph is intended for researchers, teachers, students to higher education institutions, postgraduates, doctoral students, practitioners, representatives of state authorities and local self-government, business, university administrative staff, representatives of civil society, the public and all interested parties.

UDC 33(082)

ISBN 978-9934-26-581-5

"Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or [name of the granting authority]. Neither the European Union nor the granting authority can be held responsible for them."

disclaimer

УДК 338.2:004.9(477:4)
Є245

Рецензенти:

Охріменко Ігор Віталійович – доктор економічних наук, професор, ректор Київського кооперативного інституту бізнесу і права;

Пуліна Тетяна Веніамінівна – доктор економічних наук, професор, завідувач кафедри менеджменту та адміністрування Національного університету «Запорізька політехніка»;

Столяров Василь Федосійович – доктор економічних наук, професор, головний науковий співробітник Науково-дослідного фінансового інституту ДННУ «Академія фінансового управління»

Рекомендовано до друку рішенням Вченої ради
Запорізького національного університету
(протокол № 11 від 27.05.2025 р.)

Матеріали подано в авторській редакції мовою оригіналу.
При повному або частковому відтворенні матеріалів даної монографії посилання на видання обов'язкове.
Представлені у виданні наукові доробки та висловлені думки належать авторам. Редакційна колегія може не поділяти думок авторів.

Європейський досвід використання цифрових технологій в економіці : Є245 колективна монографія / за ред. А. В. Череп, І. М. Дашко, Ю. О. Огренич, О. Г. Череп, В. М. Гельман. Рига, Латвія : Baltija Publishing, 2025. 326 с.
ISBN 978-9934-26-581-5
DOI 10.30525/978-9934-26-581-5

Колективна монографія виконана за результатами досліджень у рамках реалізації проєкту Програми Європейського Союзу Еразмус+ напряму Жан Моне 101085727 – EU-DIGITIZATION – ERASMUS-JMO-2022-HEI-TCH-RSCH «Digitalization of the economy in the context of the Covid-19 pandemic as a strategic platform for economic development of the state» / «Цифровізація економіки в умовах пандемії Covid-19 як стратегічна платформа розвитку економіки держави» на базі економічного факультету Запорізького національного університету. Монографія присвячена розкриттю теоретичних засад цифровізації економіки, формуванню методичних і практичних рекомендацій щодо впровадження європейського досвіду використання цифрових технологій в економіці України у воєнний та повоєнний період.

Колективна монографія розрахована на науковців, викладачів, здобувачів закладів вищої освіти, аспірантів, докторантів, фахівців-практиків, представників державних органів влади та місцевого самоврядування, бізнесу, адміністративного персоналу університетів, представників громадянського суспільства, громадськості та всіх зацікавлених осіб.

УДК 338.2:004.9(477:4)

ISBN 978-9934-26-581-5

"Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or [name of the granting authority]. Neither the European Union nor the granting authority can be held responsible for them."

disclaimer

MATSUKA Viktoriia,
PhD in Economics, Associate Professor,
Associate Professor of the Department of Management and Finance,
Mariupol State University, Kyiv, Ukraine
ORCID: https://orcid.org/0000-0002-0953-8769

HORBASHEVSKA Maryna,
PhD in Economics, Associate Professor,
Associate Professor of the Department of Management and Finance,
Mariupol State University, Kyiv, Ukraine
ORCID: https://orcid.org/0000-0002-7612-5593

2.5. DIGITAL TECHNOLOGIES IN ECONOMIC MANAGEMENT: EUROPEAN TRENDS OF DEVELOPMENT AND IMPLEMENTATION

Introduction. The digital transformation of the economy has become an important stage in the development of both individual states and international economic systems. The integration of advanced digital technologies into various sectors of the economy allows us to significantly increase the efficiency of management, simplify business processes and create new opportunities for the development of national economies. However, the process of adapting digital technologies in Ukraine, in particular in the field of economic management, taking into account European experience, is a complex task that requires a thorough study of strategies, models and political initiatives in the digital sphere. Today, a large number of scientists pay attention to the issues of digital transformation of management processes, but certain aspects of this process remain insufficiently covered.

One of the main areas of research is the development of concepts for the digital transformation of economic management. A significant contribution to the study of this issue was made by such authors as: Klaus Schwab, Andrew McAfee, Erik Brynjolfsson, Michael Porter, Martin Ford, Nicholas Carr, V. P. Vishnevsky, L. A. Tymashova,

M. A. Fedorov. Other important works belong to Here are some more authors whose works have played an important role in the study of the digital transformation of the economy, financial management and industrial technologies: John Hagel III, Chris Skinner, Don Tapscott, Claudia Zetzscheppe, Frank DiFilippo, Carl Benedict Frey, Michael Osborn, Sven Bender, Heinz Otto Pecher, Howard King, O. S. Nakonechna, O. M. Mykhaylyk, R. Burimenko, P. Smirnova. However, despite numerous studies, some aspects related to the detailed analysis of the potential for adapting EU digital standards to Ukrainian conditions of management practice require further study. In particular, among the unclear aspects are the issues of integrating European models of digital economic management taking into account the specifics of the Ukrainian market and management practice. Most studies focus on theoretical aspects of the digitalization of the economy, while practical cases of adapting European standards to Ukrainian realities in economic management remain insufficiently analyzed in detail. In addition, most of the studies focus on individual sectors of the economy, but the relationships between different industries and their joint impact on the overall development of the digital economy of Ukraine are insufficiently studied. Other issues that require further study include the adaptation of the Ukrainian legal system to European norms in the field of digital technologies, such as GDPR, as well as the creation of infrastructure to support startups and small businesses focused on digital innovations in economic management. Given the speed of technological development and constant changes in the EU regulatory environment, these issues are extremely relevant for ensuring the effective integration of Ukraine into the European digital market.

Object of research: the process of digital transformation of Ukrainian economic management with an orientation towards European experience, especially in the context of the introduction of digital technologies in various sectors of the economy.

Subject of research: practical aspects of adapting European models of the digital economy in Ukraine, in particular in the context

of EU policy in the field of the digital market, regulation of digital innovations and the introduction of new technologies in the financial sector, industry and agricultural sector.

Presentation of the main results of the study. The purpose of the research is to study the prospects and practical aspects of adapting European digital technologies in managing the economy of Ukraine, in particular in the field of management processes, finance, production and the agricultural sector, taking into account European trends in the development and implementation of digital innovations.

Digital technologies play a key role in shaping the competitiveness of the modern economy, contributing to the growth of productivity, innovation and efficiency of business processes, as well as facilitating management functions. In the global dimension, digitalization is a driver of economic development, which causes the transformation of traditional models of production, circulation and consumption of goods and services, and also changes approaches to management processes [14].

One of the key factors of competitiveness is labor productivity, which largely depends on the level of automation and digital solutions implemented in business processes, including management functions. According to research by the European Commission, companies that actively use digital technologies demonstrate higher productivity growth rates than enterprises that use traditional management and production methods. The introduction of digital technologies into management processes allows you to reduce costs, optimize resources and respond faster to market changes.

Digital transformation contributes to: optimizing production and management processes through the use of the Internet of Things (IoT), artificial intelligence (AI) and big data (Big Data), which improve not only productivity, but also the process of making management decisions; reducing resource management costs through the use of cloud computing and automated control systems, which ensures greater accuracy and efficiency of management functions; increasing the

flexibility and adaptability of enterprises through digital platforms that ensure rapid response to changing market conditions, including in the context of organizational change management and business process restructuring.

Innovation is an important component of the competitiveness of an economy, and digital technologies play a central role in the development of new business models and the creation of digital ecosystems. In particular, the European Union actively supports digital innovation through initiatives such as the Digital Europe Programme, which aims to develop advanced digital skills, artificial intelligence, cybersecurity and high-performance computing.

An important role in this context is played by the concept of digital platforms, which ensure effective information exchange between market participants, facilitating the integration of small and medium-sized businesses into global value chains. This, in turn, changes approaches to management functions in organizations, as digital platforms allow managers to effectively organize the exchange of information and resources to achieve maximum results.

Successful integration of digital technologies into the national economy allows countries to improve their positions in global competitiveness rankings. According to Global Competitiveness Index (GCI), developed by the World Economic Forum, a high level of digitalization is one of the key factors for economic resilience and growth.

European Union countries demonstrate high levels of digital competitiveness due to: active development of digital infrastructure (5G, fiber optic networks), which significantly facilitates management processes; investments in digital education and increasing the digital literacy of the population, which allows ensuring a high level of management competencies in the context of digital transformations; effective regulation of the digital economy (GDPR, Digital Services Act), which creates favorable conditions for the development and management of digital markets.

For Ukraine, the adaptation of European experience in digitalization can be an important factor in increasing competitiveness

at the international level. Particular attention should be paid to the development of digital platforms, production automation, and the introduction of artificial intelligence and other advanced technologies into business processes and management functions [12].

Digital transformation is one of the key directions of economic development of European countries. In different countries, unique digitalization strategies have been formed, which correspond to their economic, technological and social characteristics [21; 22]. The most successful models of digital transformation include: "Industry 4.0" in Germany – digitalization of industry and production; e-Government in Estonia – comprehensive implementation of digital public services; artificial intelligence in France – strategy for the development of AI and machine learning; fintech and digital payments in the UK – leadership in the implementation of blockchain technologies and cashless payments; digital entrepreneurship in Sweden – a favorable environment for startups and innovative business models (Table 1).

Germany is a leader in the digitalization of industrial production thanks to the Industry 4.0 program launched in 2011. The main idea is the integration of the Internet of Things (IoT), artificial intelligence (AI), and automation into production processes [11; 20]. The main aspects of Industry 4.0: smart factories (Smart Factories) – fully automated production, controlled by AI; IoT – data exchange between devices in real time; Big Data and predictive analytics – predicting equipment failures; cyber-physical systems – integrating physical processes with digital technologies (example: Siemens plant in Amberg – 75 % of production processes are automated, which reduced costs and increased productivity by 20 %).

Germany demonstrates significant investments in digital technologies, which have a positive impact on its economy. The high level of investment indicates the country's serious efforts towards digitalization, which contributes to GDP growth [15; 17].

Table 1

Comparison of digitalization approaches in Europe

Country	The main direction of digitalization	Key techno-logies	State initiatives and strategies	Invest-ments ($ billion)	Results (statistics)
Germany	"Industry 4.0" (industry)	Big Data, 5G, automation	Industrie 4.0 Strategy, Digital Innovation Support Fund	50+ $ billion (until 2025)	Productivity in industry increased by 25%, IoT implementation in 60% of factories
Estonia	e-Government (government services)	X-Road, Blockchain, AI, digital ID cards	e-Residency program, digital ID cards, open data law	$1.5 billion	99% of government services are available online, 30% of residents – e-Residents
France	Artificial Intelligence (AI)	Machine learning, computer vision, NLP	France AI Strategy, a state fund to support AI startups	$1.8 billion (2023–2025)	AI companies received $3.5 billion in investment in 2023, 40% of startups in the field of AI
Great Britain	Fintech and digital payments	Blockchain, Open Banking, Smart Contracts	FCA Sandbox, National Fintech Innovation Strategy	$15 billion	70% of the population uses mobile payments, 50% of all fintech startups
Sweden	Digital startups	Big Data, e-com-merce, Cloud Computing	Digital First Program, government grants for technology startups	10+ billion $	90+ technological "unicorns" (startups worth $1+ billion), 80% of the population uses cashless payments

Source: [9; 10; 12]

Estonia became the first country in the world to implement a fully digital public administration system. This allowed citizens to receive most public services online. Key components of e-Government: X-Road – a platform for data exchange between government institutions; e-Residency – an opportunity for foreigners to do business

in Estonia remotely; i-Voting – electronic voting (used by over 40 % of citizens); e-Health – digital health cards and online prescriptions (example: the implementation of e-Government allowed saving 2 % of GDP annually by reducing bureaucracy). Estonia, with lower absolute investments compared to Germany, achieved a significant impact on GDP. This indicates a high efficiency of using digital technologies in its economy [18].

France is investing heavily in artificial intelligence (AI) to increase its competitiveness in the global economy. In 2018, the country launched the "AI for Humanity", aimed at the development of machine learning and automation. Directions of AI development in France: investments in research (1,5 billion euros); AI in public services (healthcare, transport); development of a startup ecosystem (example: the company Owkin uses AI to diagnose diseases, which increases the accuracy of medical analyzes). France shows a moderate level of investment in digitalization with a corresponding positive impact on GDP. This indicates a gradual but stable introduction of digital technologies into its economy [16].

The UK is a world leader in financial technology (fintech). London has become a global hub for startups in the fields of digital payments, blockchain and cryptocurrencies. The main areas of the fintech industry; digital banks (Revolut, Monzo) – banking without physical branches; cryptocurrencies and blockchain – the development of decentralized financial systems; fast payments (Faster Payments System) – instant money transfers (example: 90 % of banking transactions in the UK are carried out online). The UK has significant investments in digital technologies, which have a positive impact on its economy. The high level of investment indicates the country's serious efforts towards digitalization, which contributes to GDP growth.

Sweden is one of the leaders in the number of technology startups per capita. The country has created favorable conditions for the development of innovative businesses. Success factors for digital entrepreneurship: high level of digital literacy of the population; investments in technology clusters (Stockholm – "Silicon Valley of

Europe"); state support for startups (example: Spotify – a Swedish startup that has become a global leader in streaming music). Sweden demonstrates significant investments in digital technologies, which have a positive impact on its economy. The high level of investment indicates the country's serious efforts towards digitalization, which contributes to GDP growth.

There is a positive correlation between the level of investment in digitalization and the impact on GDP. Countries with higher investments tend to have a higher impact on GDP (Figure 1).

Estonia shows that even with lower absolute investments, a significant impact on the economy can be achieved, demonstrating the effectiveness of digital technologies.

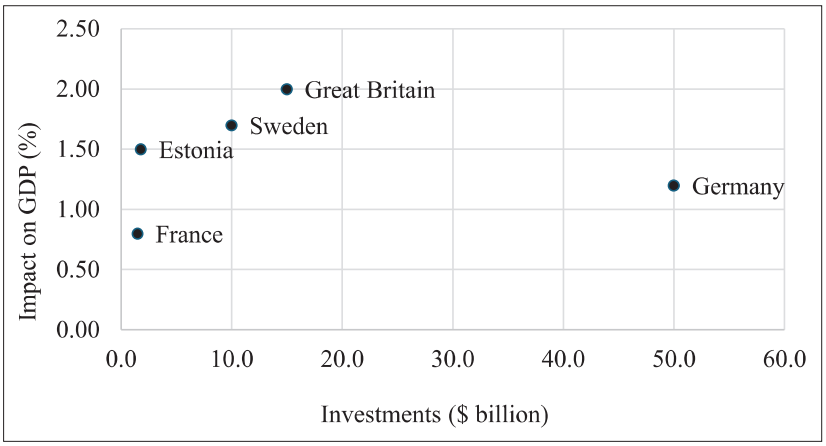

Fig. 1. Relationship between investments in digitalization and impact on GDP for different countries

Source: [14; 21]

Countries employ different strategies and scales of investment in digitalization, which is reflected in different impacts on GDP.

European countries demonstrate different approaches to digital transformation, depending on their economic priorities.

Using this experience can help accelerate the digitalization of Ukraine's economy.

The European Union (EU) digital market is one of the key areas of regulation in the context of the digital transformation of the global economy. The main goal of EU policy in this area is to create a single digital space that promotes competition, protects citizens' data and ensures the security of digital services. To achieve these goals, three main regulatory acts have been adopted:

1. Digital Services Act (DSA) – regulates the liability of online platforms for content and protects users.
2. Digital Markets Act (DMA) – introduces rules for tech giants to avoid monopolizing the digital market.
3. General Data Protection Regulation (GDPR) – sets high standards for personal data protection.

Table 2 provides an analysis of each of these regulations, their impact on businesses and users, and general trends in EU digital market regulation.

The Digital Services Act (DSA) came into force in 2022 and aims to regulate the activities of online platforms, social networks and marketplaces. Its main goal is to increase the liability of digital platforms for the distribution of illegal content, fake news and advertising.

Key provisions of the DSA: obligation of platforms to remove illegal content (hate speech, disinformation, counterfeit goods); transparency of algorithms – companies must explain how their recommendation systems work; user protection – mechanisms for appealing content blocking have been introduced; restrictions on targeted advertising – prohibition of advertising aimed at minors (example: after the implementation of the DSA, the Meta platforms (Facebook, Instagram) and YouTube introduced new mechanisms for reporting removed content and changed the principles of targeted advertising).

The Digital Markets Act (DMA) was passed in 2022 to prevent monopolization of the technology sector and limit the dominance of large platforms, called "gatekeepers".

Table 2

Key EU legislation in the digital market

Legislative act	Main goal	Key provisions	Business impact	Impact on users	Fines for violations
DSA (Digital Services Act)	Regulation of online platforms, combating disinformation and illegal content	Content control, algorithm transparency, user protection from manipulation	Platforms are required to quickly remove illegal content, restrict advertising	Greater protection against fake news, transparency of online advertising	Up to 6% of the company's global annual turnover
DMA (Digital Markets Act)	Preventing monopolization of the digital market	Prohibition on preferences, mandatory open access to API, service compatibility	"Gatekeepers" are required to open ecosystems to competitors	More choice of digital services, better conditions of competition	Up to 10% of the company's global annual turnover
GDPR (General Data Protection Regulation)	Protection of users' personal data	cybersecurity requirements	The need to implement new data protection standards	Full control over personal information, right to delete data	Up to 20 million euros or 4% of the company's annual turnover

Source: [9; 10; 22]

Gatekeepers are large technology companies with a large number of users and significant influence on the digital market. These include Google, Apple, Amazon, Meta, Microsoft. The main rules of the DMA for gatekeepers: a ban on unfair promotion of their own services (for example, Google cannot give preference to its own products in search results); an obligation to ensure interoperability of services (for example, messengers WhatsApp and Telegram must be able to exchange messages); restrictions on the collection of personal data without the user's consent. Example: after the implementation of DMA, Apple is obliged to allow the installation of applications not only through the App Store, but also through third-party stores. Google is forced to ensure equal access to search services for competitors.

GDPR (General Data Protection Regulation) came into force in 2018 and became the strictest legislation in the world regarding the protection of personal data. The main principles of the GDPR: the right to access personal data; the right to be forgotten (delete data); mandatory user consent for information collection; high fines for violations. Example: in 2021, Google and Meta received fines of €746 million and €225 million, respectively, for violating user data collection rules.

The EU's digital market policy aims to establish a level playing field for businesses, protect users' personal data, and ensure platforms are held accountable for content. The overall effect of implementing the laws is a safer, more competitive, and more transparent digital market in the EU, which serves as an example for other countries, including Ukraine.

Support for digital innovation is based on the concept of creating a favorable innovation environment, where the development of new technologies is stimulated through government programs, financial instruments, and regulatory initiatives. The main tasks of such mechanisms are:

Financial support: ensuring access to grants, investments and credit resources for innovative projects.

Institutional support: Creation of innovation centers, accelerators, incubators, and digital platforms that facilitate collaboration between academic institutions, businesses, and government.

Regulatory Incentives: Developing regulations and standards that reduce barriers to the adoption of new technologies and foster the digital economy.

The European Union actively uses a range of measures to support digital innovation, including:

Funding programs:

– Horizon 2020 / Horizon Europe: European framework programs that provide grants for research and development in the field of digital technologies and innovation.

– European Innovation Council (EIC) Accelerator: The program aims to support small and medium-sized enterprises (SMEs) with high potential for innovation [3].

Institutional tools:

– Digital Innovation Hubs (DIH): A network of centers that provides consulting, technological and financial support to enterprises during the implementation of digital solutions [2].

– Incubators and accelerators: Creating conditions for early-stage startup development by providing mentoring support, workspaces, and access to financial resources [3].

Regulatory initiatives and regulatory incentives:

– Development of special standards and norms that facilitate the implementation of digital technologies in various sectors of the economy.

– Creating legal conditions for data use, intellectual property protection, and cybersecurity.

A comparative analysis of digital innovation support mechanisms is presented in Table 3.

The implementation of a comprehensive system of support for digital innovation in Europe is based on the integration of financial, institutional and regulatory mechanisms. Thanks to such measures, a favorable environment is created for the development of technological startups, the introduction of innovative solutions in traditional industries and the strengthening of the overall competitiveness of the economy.

Based on the analysis of these mechanisms, it can be concluded that their synergy is a key factor in successful digital transformation at both the European and national levels.

Ukraine is on the path of European integration, which involves harmonizing national legislation and standards with the regulatory framework of the European Union. The implementation of European standards in various areas – from the digital economy to personal data protection – is an important tool for increasing competitiveness, modernizing public administration and stimulating economic growth.

This section examines key aspects of the potential for adapting European standards in Ukraine, the main benefits, as well as the challenges that accompany this process.

Table 3

Comparative analysis of mechanisms for supporting digital innovations

Support mechanism	Description	Target audience	Basic tools	Expected effect
Horizon 2020 / Horizon Europe	Funding research and development in digital technologies	Scientific institutions, SMEs	Grants, subsidies, joint projects	Development of high-tech solutions
EIC Accelerator	Supporting innovative, high-growth startups	SMEs, startups	Financing, consulting, networking opportunities	Accelerating product launch to market
Digital Innovation Hubs (DIH)	Creation of innovation centers for the integration of digital technologies	Industry, small and medium-sized businesses	Technical consultations, testing, demonstration projects	Increasing the level of digital transformation of enterprises
Incubators and accelerators	Mentoring and organizational support for startups	Startups, innovative enterprises	Mentoring, access to funding, workspaces	Formation of sustainable innovative business models
Regulatory initiatives	Development of regulatory conditions to stimulate digitalization	All participants in the digital economy	Legislative acts, standards, recommen-dations	Reducing barriers to digital adoption

Source: [2; 3; 6]

Let's consider aspects of implementing European standards.

1. Legislative harmonization: Harmonization of national legislation with European standards (e.g. GDPR, DSA, DMA) contributes to the creation of a legal environment that ensures the protection of citizens' rights, transparency of business processes, and effective regulation of the digital market.

2. Institutional capacity: Improving the work of state institutions, increasing the level of digital literacy of officials, and creating specialized bodies and innovation centers contribute to the successful implementation of European practices.

3. Technological infrastructure: The development of digital infrastructure (broadband internet, 5G, digital platforms) is a prerequisite

for the implementation of modern European standards. Increased investment in technological modernization contributes to increasing the efficiency of production, public services and business processes.

4. Economic effect: The implementation of European standards stimulates the development of innovations, attracts foreign investments and creates favorable conditions for the development of a competitive environment. This allows Ukrainian enterprises to increase their competitiveness in the international market.

5. Adaptation challenges: Despite the potential, the implementation of European standards is accompanied by a number of challenges, including: the need to reform legislation, improve staff skills, adapt existing business models, and invest in modernizing the technological base.

A comparative analysis of key European standards and the possibilities of their implementation in Ukraine is presented in Table 4.

Table 4

Comparative analysis of key European standards and possibilities of their implementation in Ukraine

Key standard/ direction	Description	Current situation in Ukraine	Potential benefits	Main challenges
GDPR	Protecting personal data and establishing high security standards	Partial adaptation, need for updating legislation	Increasing consumer trust, improving business processes	Lack of qualified personnel, IT modernization costs
DSA and DMA	Regulation of digital services and markets, prevention of monopolization	Lack of a full-fledged legislative framework	Creating a level playing field for competitors, reducing monopolies	The need for radical changes in the market structure
Industry 4.0	Digitalization of production, automation and use of IoT	Initial phase of implementation in selected industries	Increasing productivity, reducing production costs	Investment dependence, technical incompatibility
e-Government	Digitalization of public services, e-government	Partial implementation in certain regions	Reducing bureaucracy, increasing government transparency	Lack of a single digital space, cybersecurity

Source: [2; 5; 6]

The implementation of European standards in Ukraine is a multidimensional process that requires synergy between legislative reforms, institutional capacity development and technological infrastructure modernization [13].

The successful implementation of such standards can become a catalyst for the development of the digital economy, improving the quality of public services and increasing the competitiveness of Ukrainian enterprises.

However, the adaptation process is accompanied by a number of challenges that require a systematic approach and significant investments. Therefore, strategic planning and partnership between the public, private sectors and international organizations are key factors for achieving the desired effect.

The scheme of the process of implementing European standards in Ukraine is shown in Fig. 2.

Industries that continue to actively implement digital technologies are listed in Table 5.

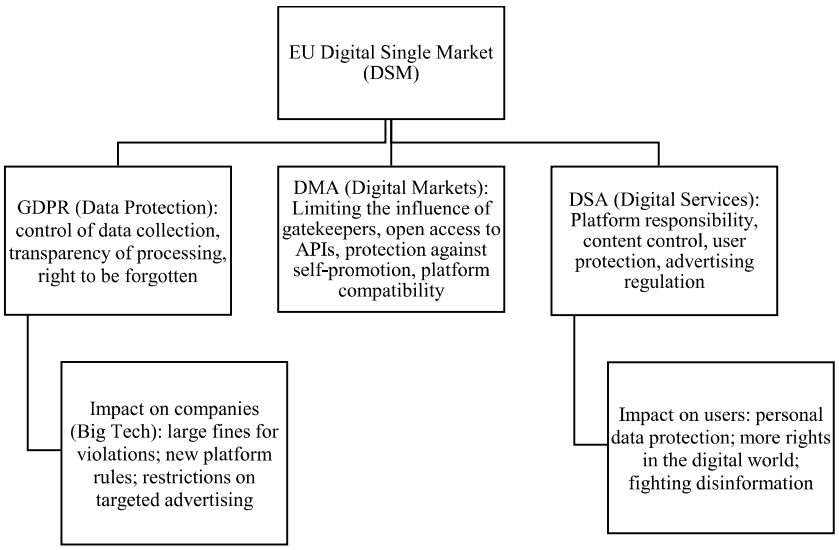

Fig. 2. Scheme of the process of implementing European standards in Ukraine

Source: [2; 5; 6]

Table 5

Digital technologies in various industries

Branch	Key technologies	Application example	Development prospects
Transport	Autonomous vehicles, electric cars, IoT	Volvo (Sweden) – electric autonomous trucks	Reducing transportation costs, reducing CO_2 emissions
Logistics	IoT, big data, AI	DHL (Germany) – robotic warehouses, delivery drones	Route optimization, reduction of inventory costs
Pharma-ceutics	AI, big data, production automation	Novartis (Switzerland) – analysis of molecules for drug development	Reduced research time, personalized medicine
Medicine	Telemedicine, AI, big data	NHS Digital (UK) – online consultations	Improving access to medical services, more accurate diagnostics
Education	Online platforms, adaptive learning	e-education (Estonia) – distance learning	Personalization of learning, expanding access to educational resources
Tourism	Mobile apps, virtual tours	Airbnb (France) – online accommodation booking	Expansion of digital booking platforms, interactive tours
Restaurant business	Robotics, mobile applications for orders	Domino's Pizza (UK) – ordering via apps	Service automation, growth of online orders
Agricultural sector	Precision farming, IoT, big data	Wageningen University (Netherlands) – soil monitoring	Increasing yields, reducing resource costs
Industry	Industry 4.0, AI, robotics, IoT	Siemens (Germany), Bosch (Germany) – smart factories	Optimization of production processes, reduction of costs, increase of efficiency
Finances	Blockchain, cryptocurrencies, AI	Revolut (UK) – online banking, asset management	Increasing the security of financial transactions, automating processes
Energy	Renewable energy sources, IoT, Smart Grids	Siemens Gamesa (Germany) – wind turbines, Smart system Grid	Development of clean energy sources, optimization of energy consumption
Construction	BIM (Building Information Modeling), 3D printing, IoT	Skanska (Sweden) – using BIM for design and construction management	Increasing the efficiency of construction processes, reducing costs
Retail	Big Data, e-commerce platforms, chatbots	IKEA (Sweden) – using Big Data for purchasing analysis and inventory optimization	Personalization of purchases, improving customer experience

Source: [4; 7; 10; 24]

This allows not only to increase economic efficiency, but also to improve the quality of services for end consumers, increasing competitiveness in the global market.

Digital technologies in each of these industries continue to change the rules of the game, creating new opportunities for development and improvement of economic indicators. They allow to reduce costs, improve the quality of services and products, as well as increase the efficiency of business processes.

Prospects for adapting European experience in Ukraine.

Adapting the European experience of digitalization in Ukraine is an important strategic direction that will allow the country not only to integrate into the global digital market, but also to ensure sustainable economic development in new technological realities.

Taking into account the European context, it is necessary to analyze the challenges and opportunities that arise when adapting innovative approaches to the digitalization of the Ukrainian economy.

To successfully adapt European experience in Ukraine, several key strategic steps need to be taken.

Main strategic priorities of digitalization (Table 6):

1. Modernization of digital infrastructure. Development of high-speed Internet, introduction of 5G technologies, support for the concept of smart cities.

2. Integration into EU digital platforms. Harmonization of legislation, increasing regulatory transparency, protecting consumer rights in the digital environment.

3. Support for startups and innovation. Creating conditions for the development of technological startups and venture investments.

4. Digital transformation of traditional industries. Adaptation of digital technologies in agriculture, healthcare, finance and industry.

To assess the prospects for adapting the European experience of digitalization in Ukraine, a SWOT analysis can be applied, which will provide a deeper understanding of internal strengths and weaknesses, as well as opportunities and threats (Table 7).

Table 6

Strategic priorities of digitalization of the Ukrainian economy

Priority	Implementation tools	Expected results	Projected impact on the economy
Modernization of digital infrastructure	Development of 5G, IoT, broadband access, smart cities	Increasing accessibility to the Internet and modern technologies	Reducing infrastructure costs, improving the business climate
Integration into EU digital platforms	Adaptation to GDPR standards, cybersecurity support, e-commerce development	Access to the EU's digital single market, simplification of customs procedures	Increased trade volumes, investment attraction, GDP growth
Support for startups and innovations	Soft loans, incubators, venture funds	Creation of new jobs, development of innovative technologies	Increasing the competitiveness of enterprises, creating technological clusters
Digital transformation of traditional industries	Investments in agriculture, medicine, finance, energy	Increasing production efficiency, creating new business models	Increased productivity, reduced production and maintenance costs

Source: [19; 23; 25]

Table 7

SWOT analysis of the adaptation of European digitalization experience in Ukraine

Strengths	Weaknesses
– Opportunities for the development of 5G, IoT, and high-speed Internet technologies; – Potential for adaptation to European standards; – High demand for digital services, large number of small and medium-sized enterprises; – The potential for the development of innovative startups, high qualifications of IT specialists.	– Insufficient level of access to high-speed Internet in the regions; – Imperfection of the regulatory framework in the field of digital economy; – Insufficient number of specialized incubators and accelerators; – High competition in the technology startup market, imperfect venture investment system.

Table 7 (ending)

Opportunities	Threats
– Development of smart city infrastructure, 5G technologies; – Facilitating access to the EU's digital single market; – Integration into European platforms and markets; – Support for startups, development of innovative technologies.	– Risk of falling behind global trends in case of insufficient investment; – Risks of inconsistency in adapting legislation to European standards; – The emergence of competitors from other countries, instability of the economic situation; – High costs of adapting new technologies, possible instability in financing.

Source: [8; 9; 23]

Taking into account the results of the analysis, for the successful adaptation of the European experience of digitalization in Ukraine it is necessary (Fig. 3):

1. Infrastructure modernization. Invest in the development of high-speed Internet, smart cities, 5G networks, and ensure equal access to digital services for all regions.

2. Adaptation of legislation. Updating the regulatory framework in accordance with EU requirements in the areas of data protection, cybersecurity, e-commerce, electronic payments, and digital platform standards.

3. Support for innovation. Creating conditions for the development of startups through tax breaks, creating incubators and accelerators to support technology enterprises.

4. Digital business transformation. Promote the integration of digital technologies into production processes, as well as create financing and lending mechanisms for small and medium-sized businesses.

5. Improving digital literacy. Implementing national programs to improve skills in IT and digital skills, including through online education and specialized courses.

The digital transformation of the economy is a key factor in increasing the competitiveness of countries in the global market.

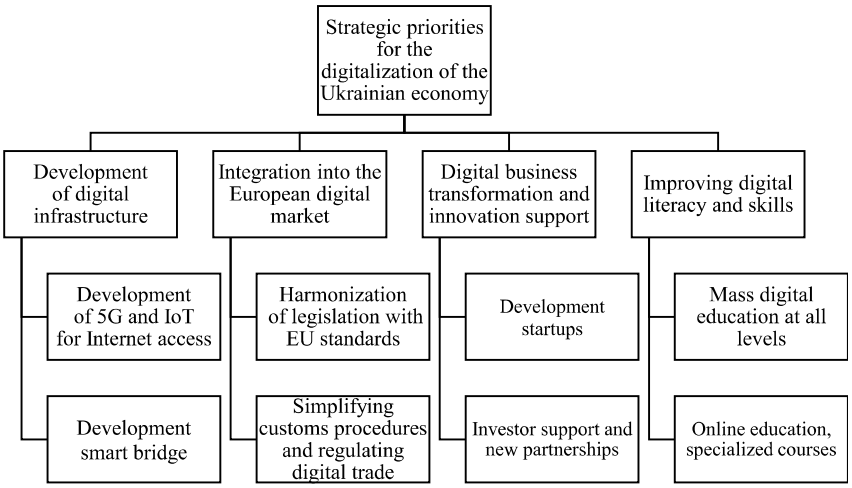

Fig. 3. Integration steps Ukraine to the EU digital market

Source: [12; 13; 19; 23]

Effective management of digital transformation plays a crucial role in the implementation of modern technologies, infrastructure development and regulation of the digital market. European experience in the implementation of digital technologies, which includes examples such as Industry 4.0 in Germany, e-government in Estonia and innovations in the field of artificial intelligence in France, demonstrates the importance of an integrated approach to the development of digital technologies in different sectors of the economy. Digital process management contributes not only to the modernization of traditional industries, but also to the creation of new economic opportunities, such as the development of financial technologies, automation of production and the introduction of precision agriculture.

Regulation and governance of the EU digital market, represented by important initiatives such as the DSA (Digital Services Act), DMA (Digital Markets Act) and GDPR (General Data Protection Regulation) Data Protection Regulation), puts the protection of consumer rights

and the creation of equal conditions for all participants in the digital economy at the forefront. Mechanisms of public administration and support for digital innovations, in particular through state programs and startup financing, contribute to the development of new technologies and business models. However, despite the potential for integrating European standards, Ukraine faces numerous challenges, including the need to effectively manage the process of infrastructure modernization, improve the legislative framework, and increase the level of digital literacy among citizens and businesses.

Practical cases of managing the introduction of digital technologies into the economy, as shown by examples from various sectors, such as the financial sector, industry and agriculture, demonstrate successful strategies for optimizing management processes, increasing the efficiency of production and service processes, reducing costs and improving the quality of products and services. The introduction of the digital euro, the development of fintech innovations, automation of production based on AI and IoT, as well as precision agriculture are powerful tools for the development of the economies of EU countries.

It is important for Ukraine to focus on European strategies for digitalization of the economy, while adapting them to local conditions and specifics. Defining strategic priorities, such as effective management of the development of digital infrastructure, introduction of innovative technologies in various sectors of the economy and support for startups, will be an important step in achieving Ukraine's integration into the EU digital market. The main challenges for Ukrainian business are the instability of the legal system, insufficient funding and limited access to modern technologies. However, these problems can be solved through effective state management of digital transformation, partnerships with European companies, introduction of new forms of financing and harmonization of national legislation with European standards.

Conclusions. To successfully integrate into the EU digital market, Ukraine needs to strengthen its digital governance mechanisms, cooperate with European countries, invest in education and digital

literacy at all levels, and improve regulation to support innovation and protect consumer rights. As a result, effective management of the digital transformation will allow Ukraine to become an important player in the EU digital market, which, in turn, will contribute to its economic development and integration into the European economy.

For further research in Ukraine, it is important to consider the issue of adapting European digitalization standards, in particular in the context of managing Industry 4.0 and precision agriculture technologies, taking into account the socio-economic characteristics of the country. Important topics for research include barriers for small and medium-sized businesses, legal changes in regulating the digital economy, social and ethical aspects of digitalization, as well as managing the implementation of digital technologies in the pharmaceutical, medical, transport and logistics industries. It is also necessary to study effective mechanisms for supporting digital innovations and favorable strategies for the development of startups, as well as explore the possibilities of public governance and partnerships between public and private initiatives in digital transformation.

List of sources used

1. Європейська Комісія. Digital Innovation Hubs (DIH). 2021. URL: https://ec.europa.eu/digital-single-market/en/digital-innovation-hubs (Last accessed: 25.03.2025).

2. Європейська Комісія. Digital Markets Act (DMA). 2020. URL: https://ec.europa.eu/commission/presscorner/detail/en/IP_20_2340 (Last accessed: 25.03.2025).

3. Європейська Комісія. European Innovation Council (EIC) Accelerator. 2019. URL: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home (Last accessed: 25.03.2025).

4. Європейська Комісія. Fintech Action Plan 2021 – Accelerating digital innovation in finance. 2021. URL: https://ec.europa.eu/info/publications (Last accessed: 25.03.2025).

5. Європейська Комісія. Regulation (EU) 2016/679 of the European Parliament and of the Council on the protection of natural

persons with regard to the processing of personal data (GDPR). Official Journal of the European Union. 2016.

6. Європейська Комісія. The Digital Single Market: Bringing Europe Together in the Digital Age. 2015. URL: https://ec.europa.eu/digital-single-market/en/policies/shaping-digital-single-market (Last accessed: 25.03.2025).

7. Європейський центральний банк (ЄЦБ). Report on a digital euro – Concept and key issues. 2020. URL: https://www.ecb.europa.eu (Last accessed: 25.03.2025).

8. Мацука В. М. Діджиталізація менеджменту: світові тренди. *Європейський досвід використання цифрових технологій в економіці в умовах пандемії COVID-19* : матеріали Міжнар. наук.-практ. інтернет-конф. (Запоріжжя, 20 жовтня 2023 р.) / за ред. А. В. Череп, І. М. Дашко, Ю. О. Огренич, В. М. Гельман, О. Г. Череп. Запоріжжя : Запорізький національний університет, 2023. С. 233–236.

9. Мацука В. М. Переваги бізнес-інновацій та цифрової трансформації. *Сучасне управління організаціями: концепції, цифрові трансформації, моделі інноваційного розвитку* : збірник тез доповідей ІІ Міжнар. наук.-практ. конф. (м. Харків, 20 листопада 2023 р.). Харків : ХНУ імені В. Н. Каразіна, 2023. С. 174–176. URL: https://ekhnuir.karazin.ua/handle/123456789/18197 (Last accessed: 25.03.2025).

10. Мацука В. М. Приклади застосування цифрових технологій в економіці. *Особливості інтеграції країн у світовий економічний та політико-правовий простір* : матеріали Х Міжнар. наук.-практ. конф. (м. Київ, 15 грудня 2023 р.) / за заг. ред. О. В. Булатової. Київ : МДУ, 2023. С. 112–113.

11. Мацука В. М. Сучасні напрями розвитку політики штучного інтелекту в ЄС. *Стратегії та політики ЄС: інституційна структура та механізми реалізації* : матеріали І наук.-практ. конф. (м. Кривий Ріг, 21–22 березня 2024 р.). Кривий Ріг : Донецький національний університет економіки і торгівлі імені Михайла Туган-Барановського, 2024. С. 32–35. URL: http://elibrary.donnuet.edu.ua/2882/1/Конференція_2024_01.05.pdf (Last accessed: 25.03.2025).

12. Реслер М., Лінтур І., Цигак О. Цифрова економіка: виклики та можливості. *Економіка та суспільство*. 2024. (64). URL: https://doi.org/10.32782/2524-0072/2024-64-117 (Last accessed: 25.03.2025).

13. Цифрова економіка: тренди, ризики та соціальні детермінанти. Центр Разумкова. Видавництво «Заповіт». 2020. 274 с. URL: https://razumkov.org.ua/uploads/article/2020_digitalization.pdf (Last accessed: 25.03.2025).

14. Digital Economy and Society Index (DESI) 2020. URL: https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2020 (Last accessed: 25.03.2025).

15. Duan Y., Shuplat O., Matsuka V., Lukash S., Horbashevska M., Kyslova L. Risk Management Strategy for International Investment Projects of an Innovative Enterprise in the Context of Industry 4.0. *Economic Affairs (New Delhi)*. 2023. Vol. 68. No. 04. P. 2047–2056. URL: http://ndpublisher.in/admin/issues/EAv68n5p.pdf (Last accessed: 25.03.2025).

16. French Government, Ministry of Economy and Digital Affairs. France AI Strategy: Building a Competitive and Ethical AI Ecosystem. 2018. URL: https://ai-watch.ec.europa.eu/countries/france/france-ai-strategy-report_en (Last accessed: 25.03.2025).

17. Hermann M., Pentek T., Otto B. Design Principles for Industrie 4.0 Scenarios. *Proceedings of 49th Hawaii International Conference on System Sciences HICSS* (Koloa. 5–8 January 2016). Koloa, HI, USA, 2016. P. 3928–3937. URL: https://doi.org/10.1109/HICSS.2016.488 (Last accessed: 25.03.2025).

18. Kalvet T. e-Estonia: A Model for Digital Governance. *Journal of Information Technology & Politics.* 2017.

19. Maksymenko I., Akimov A., Markova S. Trends in the digital transformation of Ukraine's economy in the context of war. *Baltic Journal of Economic Studies.* 2024. 10 (1). P. 175–184. URL: https://doi.org/10.30525/2256-0742/2024-10-1-175-184 (Last accessed: 25.03.2025).

20. Matsuka V., Horbashevska M. Artificial Intelligence in the Context of Business Management. *Системи та засоби штучного інтелекту* :

тези доповідей Міжнар. наук. конф. «Штучний інтелект: досягнення, виклики та ризики» (м. Київ, 15–16 березня 2024 р.). Київ : ІПШІ «Наука і освіта», 2024. С. 458–462. URL: https://www.ipai.net.ua/docs/ai_conf_15.03.2024.pdf (Last accessed: 25.03.2025).

21. Nisha Tusharkumar Gajjar. Data Privacy and Protection in the Digital Age: Emerging Trends and Technologies. *International Journal of Engineering Applied Science and Management*. 2024. Vol. 5.

22. The ubiquitous digital single market. 2018. URL: https://www.europarl.europa.eu/factsheets/en/sheet/43/the-ubiquitous-digital-single-market (Last accessed: 25.03.2025).

23. Ukraine's Digital Economy Strategy (2020–2025). Ministry of Digital Transformation of Ukraine. Kyiv : Government of Ukraine.

24. Wolfert S., Ge L., Verdouw C., Bogaardt M. J. Big Data in Smart Farming – A review. *Agricultural Systems*. 2017. 153. P. 69–80.

25. World Bank 2021. Ukraine: Digital Transformation and Economic Growth. Washington, D. C. : World Bank Group.