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# DIGITALIZATION OF ACCOUNTING PROCESSES AND FINANCIAL FORECASTING: THE EXPERIENCE OF EU MEMBER STATES

# **ДІДЖИТАЛІЗАЦІЯ ОБЛІКОВИХ ПРОЦЕСІВ** ТА ФІНАНСОВОГО ПРОГНОЗУВАННЯ: ДОСВІД КРАЇН ЄС

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## Семенова Світлана

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Digitalization constantly changes the processes of formation, processing, interpretation, exchange and use of information in the field of accounting and financial forecasting. The advantages of digitalization are accompanied by challenges, which is why the experience of European countries is extremely valuable for Ukraine on the way to restoring and implementing European integration aspirations and reforms. The article considers the features and advantages of digitalization of accounting processes and financial forecasting of economic entities in the EU, the current state in this area, provides an overview of obstacles, problems and possible ways to overcome them. The review of scientific sources indicates significant achievements in the implementation of modern technologies, such as ERP systems, cloud services, big data analytics, artificial intelligence and blockchain. Research shows that these technologies significantly improve the efficiency of accounting processes and the accuracy of financial forecasts, contributing to automation, increasing accountability according to user needs, improving transparency and optimizing costs. In addition, digitalization allows more integrated use of accounting data for management and financial forecasting needs. It is determined that digitalization in the EU faces problems of cybersecurity, high costs for the introduction of new technologies, different levels of digital maturity among member countries, as well as unification of standards and regulatory requirements. The integration of advanced technologies requires significant investment and training, which is a barrier for small and medium-sized enterprises. The diversity of national laws makes it difficult to harmonize digital solutions at the European level, reducing the effectiveness of interstate financial cooperation and data exchange. These challenges can be overcome through harmonisation of regulatory requirements at EU level, increased investment in cybersecurity and digital technologies, and through the delivery of training programmes to improve digital literacy of workers. In addition, the creation of common standards and platforms for data exchange will contribute to more efficient integration of digital solutions into the financial sector. Using the experience of the EU member states in digitalization of accounting and financial forecasting will allow Ukraine to increase the accuracy and efficiency of financial processes, optimize accounting operations, reduce risks and improve data transparency. This will contribute to making sound strategic decisions, ensuring cybersecurity and attracting investments for the sustainable development of the financial sector in the context of digital transformation. Keywords: digitization, accounting, accounting information, financial forecasting, planning, management,

strategic management accounting, experience of EU member states.

Діджиталізація невпинно змінює процеси формування, опрацювання, інтерпретації, обміну та використання інформації у сфері обліку і фінансового прогнозування. Переваги діджиталізації супроводжуються викликами, саме тому досвід європейських країн є надзвичайно цінним для України на шляху реалізації євроінтеграційних прагнень та реформ. У статті розглянуто особливості та переваги діджиталізації облікових процесів та фінансового прогнозування в ЄС, наведено огляд наявних проблем та можливих шляхів їх подолання. Наукові джерела свідчать про вагомі досягнення у впровадженні сучасних технологій, таких як ERP-системи, аналітика великих даних, штучний інтелект та блокчейн. Дослідження показують, що ці технології значно підвищують ефективність облікових процесів і точність фінансових прогнозів, сприяючи автоматизації, збільшенню підзвітності згідно з потребами користувачів, покращенню прозорості та оптимізації витрат, дозволяють більш інтегровано використовувати дані обліку для потреб управління і фінансового про-



гнозування. Встановлено, що діджиталізація в ЄС стикається з проблемами кібербезпеки та перешкодами у вигляді високих початкових витрат на впровадження нових технологій, а також наявністю різного рівня цифрової зрілості серед країн-членів, недостатньої уніфікації стандартів і регуляторних вимог. Інтеграція передових технологій потребує значних інвестицій і підготовки кадрів, що виступає бар'єром для малих і середніх підприємств. Різноманітність національних законодавств ускладнює гармонізацію цифрових рішень на загальноєвропейському рівні, знижуючи ефективність міждержавної фінансової співпраці та обмін даними. Ці проблеми можна подолати через гармонізацію регуляторних вимог на рівні ЄС, завдяки збільшенню інвестицій у кібербезпеку та цифрові технології, а також через впровадження навчальних програм для підвищення цифрової грамотності працівників. Крім того, створення єдиних стандартів і платформ для обміну даними сприятиме більш ефективній інтеграції цифрових рішень у сферу генерування та використання облікової інформації. Використання досвіду країн ЄС у діджиталізації обліку та фінансового прогнозування дозволить Україні підвищити точність і ефективність фінансових процесів, оптимізувати облікові операції, знизити ризики та покращити прозорість даних. Це сприятиме прийняттю обґрунтованих стратегічних рішень, посиленню кібербезпеки та залученню інвестицій для стійкого розвитку бізнесу в умовах цифрової трансформації.

Ключові слова: діджиталізація, облік, облікова інформація, фінансове прогнозування, планування, управління, стратегічний управлінський облік, досвід країн членів ЄС.

**Formulation of the problem.** Digitalization of accounting processes and financial forecasting is an important stage in the development of economies of the European Union (EU). Modern digital technologies significantly change approaches to financial management, increasing the efficiency of decisions and the accuracy of financial forecasts. The experience of the EU countries in this direction is diverse and multifaceted and is of great importance for the introduction of modern technologies in Ukraine.

European practice shows that the automation of accounting processes, the use of big data, blockchain technologies, artificial intelligence and cloud services significantly increase the efficiency of management functions, the reliability and reliability of information, the speed of its use and processing. This opens up new opportunities for Ukrainian companies to reduce costs, minimize risks and increase competitiveness in the global market. Integration of digital technologies in Ukraine will contribute to business development, improvement of financial resources management and ensuring stable economic growth. Thanks to digitalization, Ukraine can adapt its financial processes to modern requirements, which will allow it to successfully integrate into the European space and enter international markets.

Analysis of recent research and publications. The review of scientific papers on the digitalization of accounting processes and financial forecasting in the EU countries reflects a wide range of studies on the introduction of modern technologies, their advantages and opportunities. Many studies emphasize the positive impact of automation of accounting operations, the use of ERP systems, Big Data analytics, blockchain technologies and artificial intelligence on the efficiency of accounting

processes and the accuracy of financial forecasts. For example, the works of Lavorato D., Piedepalumbo P., Bonsón E., Bednarova M. [1], Novichenko L., Koverninska Y., Shysh A. [2] highlight how ERP systems enhance the integration and transparency of financial information, contributing to the sustainable development of organizations. Research by Adelakun V. [3], Kureljusic M., Karger E. [4], Korol S. and Klochko A. [5] emphasize the use of artificial intelligence to improve financial forecasting and accounting functions. Literary sources, in particular "Digitalization in Europe 2022-2023" Evidence from the EIB Investment Survey [6], authors Miron D., Ionel E.-S., Belciu A.-C. [7], Holov S. [8], Shapovalova A., Kuzmenko O., Polishchuk O., Larikova T., & Myronchuk Z. [9] underline the importance of the regulatory environment and support policies that promote digital innovation across the EU. The review shows that digitalization not only improves financial control and planning, expands the possibilities of using accounting information (Shpyrko O. [10]), but also provides an opportunity for faster adaptation to changes in market conditions (Halkevvch M., Hurenko T., Andriichuk A. [11]). However, there are risks, such as the threat of cybersecurity, high initial costs for the introduction of new technologies, and problems with the integration of systems in various regulatory environments, which are noted by scientists Fomina O., Moshkovska O., Yevdoshchak V., Manachynska Υ. [12], Umantsiv H., Novikov V., Nikolaiets О. [13]. Shpyrko O., Ziabchenkova H., and Kuzmenko O. [14].

Research shows that the European experience of digitization of accounting and reporting is considered by scientists, in particular in the works of Bonsón E., Escobar T. [15], Mita V., Man M. [16], Agostino D., Saliterer I., and Steccolini I. [17], however, the problems and prospects of the impact of digitalization on the processes of accounting and financial forecasting and the peculiarities of the practice of individual EU member states still remain insufficiently covered.

The identification of previously unresolved parts of the general problem. Today, there are still debates about the need to unify standards and regulation at the EU level to ensure the integration of digital technologies in different countries, as well as the problem of maintaining a balance between innovation and data security. The problems unresolved by scholars include insufficient assessment of the benefits and obstacles to the introduction of digital technologies in the accounting processes at the enterprise, the use of accounting information not only retrospectively, but also in such areas as financial forecasting. The impact of digitalization on organizational culture, employee gualifications, as well as ethical and legal issues related to the use of big data and artificial intelligence in accounting processes and financial forecasting require attention. These aspects require further research, in particular, highlighting the practical experience of European countries to further optimize digitalization processes in Ukraine and ensure their efficiency and security.

Formulation of the goals of the article (statement of the task). The purpose of the article is to characterize the experience of European countries in the digitalization of accounting and financial forecasting processes, to outline the positive impact of modern digital technologies, as well as the risks and problems with their use, with the aim of adapting and implementing best practices in Ukraine.

**Presentation of the main research material.** In a general sense, digitization is the process of integrating digital technologies into various aspects of business and everyday life, which includes automation, the transformation of information into digital form, and the introduction of new tools to improve the efficiency, speed, and accuracy of data processing. This process allows to reduce costs, increase transparency and provide new opportunities for innovation and development [17].

Digitalization in Europe has been accelerating in recent years due to the widespread adoption of new technologies such as artificial intelligence, big data analytics and automation. The European Investment Bank (EIB) survey for 2022–2023 found that most European companies are actively investing in improving their digital platforms, automating business processes and implementing new technologies to improve productivity and competitiveness [6].

European countries actively invest in digital infrastructure, support startups and innovations, and develop initiatives to open data and improve cyber security [18]. These efforts are aimed, in particular, at improving the efficiency and transparency of accounting information and the accuracy of financial forecasts based on it in conditions of rapid technological changes. At the same time, there are significant differences between industries and countries in Europe in the levels and pace of digitalization, which reflects heterogeneity in the adoption and implementation of innovations.

Studies have shown that Western Europe, namely countries such as Germany, France and the Netherlands, are leading the way in the adoption of digital technologies due to significant investments in infrastructure, automation and research and development [6]. These countries actively use innovative solutions to increase productivity and ensure competitiveness [17].

The countries of Southern Europe, in particular Italy, Spain, Portugal, and Romania, also demonstrate significant efforts in digitalization, but with certain delays compared to their Western neighbors. These countries are focused on the modernization of existing systems and the introduction of new digital platforms, but face problems of financing and infrastructure limitations [16].

The countries of Eastern Europe, such as Poland, the Czech Republic, and Ukraine, are distinguished by the fact that digitalization is developing at a fast pace, but there are significant differences in the level of development of digital technologies between individual countries [15]. Some European countries, such as Poland, are actively investing in digital infrastructure, while others face challenges due to limited resources and less developed infrastructure [19].

The Nordic countries: Sweden, Denmark and Norway have some of the highest levels of digitization in Europe, thanks to significant investments in digital technology and innovation. These countries are characterized by a high level of automation and integration of the latest technologies into business processes.

Overall, the study shows that while digitization is a priority for many EU countries, the level and pace of technology adoption varies significantly depending on economic capacity, regulatory environment and readiness for change. An overview of the practical experience of individual EU countries in the implementation of digitalization in accounting and financial forecasting processes is presented in Table 1.

It can be concluded that the following digital technologies for the use of accounting information in financial forecasting are most common in some European countries: automation of accounting processes and Big Data analytics are actively used in Germany; in the UK, blockchain technologies and cloud-based accounting systems such as Xero and QuickBooks Online: in France, artificial intelligence (AI) and machine learning are widely used to create complex financial models; electronic invoices and process automation (RPA) are popular in Italy; in the Netherlands, financial platforms and applications are being developed that integrate various aspects of financial management, as well as high cyber security standards to protect accounting information.

Summarizing the positive experience, it is possible to outline the key advantages of digitalization of accounting and financial forecasting at the enterprise:

1. Automation of accounting processes and the use of software reduce the probability of errors and increase the speed of data processing. ERP systems (Enterprise Resource Planning), financial platforms and applications allow integration of accounting with other business processes. This allows businesses to make timely decisions based on the latest financial information, improving responsiveness to market changes and other external factors. Electronic invoices and document flow increase the speed of processing financial documents, simplify accounting and reduce costs for paper documentation.

2. Analytics of big data (Big Data) speeds up calculations and helps in visualizing financial indicators and creating accurate forecasts, which is especially relevant for the needs of strategic management accounting.

3. Blockchain technologies provide increased transparency and reliability of accounting information, and reliability of financial forecasts.

4. Artificial intelligence (AI) and machine learning are used not only to automate the analysis of financial data, but also to improve the accuracy of forecasts, planning and create financial models that can take into account a large number of variables and scenarios.

5. Cloud accounting systems, such as Xero, QuickBooks Online, Sage Business Cloud

Accounting, Microsoft Dynamics 365, NetSuite, FreeAgent, CashFlow, Zoho Books, help in the storage and processing of accounting information, provide data availability from anywhere in the world and increase work efficiency, interaction and cooperation in real time.

6. Cost savings are achieved in the long term. Despite the need for initial investment in digital technology and staff training, long-term savings can be significant. Automation reduces the need for extensive manual labor, and cloud solutions can eliminate the need for expensive on-premises equipment and maintenance.

7. Increase in productivity and efficiency, due to the fact that the introduction of modern technologies promotes better integration and interaction between different divisions of the company, which increases the overall flexibility and adaptability of the organization to changes in market conditions.

the Despite numerous advantages of digitalization of accounting processes and financial forecasting, there are problems and obstacles that need to be solved. The most significant among them are the following: (1) key risks for business are related to cyber security and data protection [18], as the increase in the amount of digital information increases the risks of cyber threats and leaks of confidential data; (2) the lack of unified standards in the field of digitization of accounting and regulations between EU countries complicates the integration of systems between different countries and companies; (3) the incompatibility of different digital systems and platforms can complicate the exchange of data and the interaction of processes, insufficient adaptation of digital technologies that take into account the specific needs of different industries and sizes of enterprises; (4) the high cost of implementing new technologies and the lack of financial resources, especially for small and medium-sized enterprises, may limit access to modern solutions, in addition, the payback of such investments is not always obvious; (5) although new technologies improve the accuracy of predictions made with the help of artificial intelligence, questions arise about their reliability in the conditions of unpredictable market changes and crises; (6) changes in organizational culture and employee behavior require significant learning and adaptation which may cause resistance efforts, to innovation; (7) ethical and legal issues such as data privacy and decision-making automation remain unsettled and require careful attention to ensure transparency and legal compliance.

## Table 1

# Experience of European countries in digitalization of accounting processes and financial forecasting

N⁰	Country	and financial forecasting Characteristics
1	2	3
1	Germany	Germany is a leader in the implementation of modern technologies in business processes, including accounting and financial forecasting. The main aspects of digitalization in Germany concern the following: the use of software for automating accounting operations, which reduces the probability of errors and increases the speed of data processing, ERP systems (Enterprise Resource Planning), which integrate accounting with other business processes, the use of big data analytics (Big Data) for analyzing financial indicators and creating accurate forecasts, cloud technologies DATEV, SAP Business One, Lexware. Special attention is paid to data visualization tools that help make informed decisions.
2	France	France is making great strides in innovating financial forecasting. Key areas include artificial intelligence (AI) and machine learning to create and analyze complex financial models, cloud platforms such as Microsoft Azure and Google Cloud to store and process large volumes of data, Big Data analytical tools to identify trends and patterns, and ERP systems such as SAP S/4HANA to integrate accounting data with other business processes, ensuring accuracy and responsiveness of financial forecasting.
3	Great Britain	Great Britain is actively implementing digitization in accounting and financial processes. Key initiatives include blockchain technologies and cloud-based accounting systems. The use of smart contracts to automate financial transactions and the use of blockchain to increase the transparency and security of financial transactions are widespread. In the UK, the most used cloud technologies for storing and processing accounting information are Xero, QuickBooks Online, Sage Business Cloud Accounting, and Microsoft Dynamics 365, which ensures data availability from anywhere in the world and increases work efficiency thanks to the possibility of real-time collaboration.
4	Italy	Italy is actively implementing digitization technologies in electronic accounting and document management. Switching to electronic invoices simplifies accounting and reduces costs for paper documentation. The use of electronic document management increases the speed of processing financial documents. Also, the integration of accounting systems with banking platforms, the use of mobile applications, special programs help to automate routine tasks, increasing the efficiency and accuracy of financial forecasting.
5	Spain	In Spain, the most used digital technologies for the use of accounting information in financial forecasting are automated accounting systems such as Sage Business Cloud Accounting and Aplos, platforms for big data analytics (Big Data) and predictive analysis, in particular, Power BI and Tableau, as well as cloud-based ERP systems like SAP S/4HANA that integrate accounting with other business processes and enable sophisticated financial modeling and analysis.
6	Netherlands	Netherlands stands out for its innovative approaches to the digitization of financial processes. A noticeable development of financial platforms that combine various aspects of financial management in one interface, and the use of mobile applications for financial forecasting and expense management. Special attention is focused on cyber security to protect accounting information and financial data from cyber-attacks, as well as implementation of advanced technologies for data protection, including multi-factor authentication and encryption.
7	Austria	In Austria, the most used digital technologies for the use of accounting information in financial forecasting are cloud ERP systems such as SAP S/4HANA and Oracle NetSuite, which provide integration of accounting data with other business processes; analytical tools for Big Data, including Tableau and Qlik platforms, which allow detailed analysis of financial indicators; and artificial intelligence to create complex financial models and forecasts used to improve the accuracy and efficiency of financial planning.

1	2	3
8	Poland	In Poland, for the use of accounting information in financial forecasting, such digital technologies as automated accounting systems, in particular Comarch ERP, which provide integration of financial data and analysis, are particularly popular; big data analytics (Big Data) for identifying financial trends and forecasting; cloud accounting platforms such as iFirma, which ensure data availability and security; and artificial intelligence (AI) used in financial forecasting solutions, including Analityca services that improve forecasting accuracy and financial management efficiency.
		Source: compiled on the basis of research [3; 6; 7; 15; 16; 17; 18; 19]

To address the challenges that accompany the digitalization of accounting and financial forecasting processes in the EU, several key aspects need to be focused on. First, it is important to ensure the unification of standards and regulations by developing pan-European norms for the integration of digital technologies, which will eliminate barriers between countries. Secondly, it is necessary to invest in modern cybersecurity tools, including data encryption, intrusion detection systems and multi-factor authentication, to protect financial information from cyber threats, especially in the context of hybrid threats from russia. The third important aspect is financial support for innovative projects through grants, subsidies and tax incentives, which will stimulate the development and implementation of new technologies. In addition, it is necessary to implement modern curricula and conduct trainings to improve the skills of employees in the field of digital technologies, which will help overcome resistance to change and ensure successful adaptation to new conditions. It is also important to develop open platforms to increase transparency and accessibility of data, which will contribute to more accurate financial forecasting. Thanks to these measures, EU countries will be able to effectively address the problems associated with the digitalization of accounting and financial forecasting and ensure the stable development of the financial sector. Therefore, it is important for Ukraine to take into account not only the benefits of successful digitalization experience in the EU, but also the existing problems and possible solutions for better adaptation at the local level.

**Conclusions.** The experience of EU countries in digitalizing accounting processes and financial forecasting is extremely valuable for Ukraine. European countries are successfully implementing modern technologies such as big data, artificial intelligence, and ERP systems,

which can significantly improve the accuracy and efficiency of financial processes. These tools automate accounting, optimize workflows, and increase the transparency of financial information. The use of European experience will allow Ukraine to reduce operating costs, reduce risks and provide more reliable support for strategic decision-making.

The digitalization of accounting processes and financial forecasting in the EU faces a number of challenges, including cybersecurity issues, high costs of implementing new technologies, different levels of capacity and readiness for digital change among EU member states, and problems with the unification of standards and regulatory requirements. The integration of advanced technologies such as big data and artificial intelligence requires significant investment and training, which creates barriers for small and medium-sized enterprises. In addition, the diversity of national legislation makes it difficult to harmonize digital solutions at the European level, which can reduce the effectiveness of interstate financial cooperation and data exchange.

The integration of advanced analytical tools and artificial intelligence will allow Ukrainian companies and government agencies to more accurately forecast financial performance, reduce risks, and make informed strategic decisions. The introduction of automated systems and ERP platforms will help optimize accounting processes, reduce costs and increase transparency. Adaptation of European standards and practices in the field of cybersecurity will protect financial data from cyber threats, which is so important for Ukraine in the context of military aggression by russia. In addition, attracting investments and financial support for innovative projects of digitalization of accounting and financial forecasting will ensure sustainable development of the economy and financial sector, and will help Ukraine on its way to integration into the EU in the current conditions of digital transformation.

Prospects for further research in the field of digitalization of accounting processes and financial forecasting include deepening the study of the integration of the latest technologies, such as artificial intelligence and blockchain, and the interdisciplinarity of accounting digitalization with other management functions to increase confidence in digital technologies. It is also important to study cybersecurity and behavioral aspects to ensure data protection and employee adaptation to new digital tools.

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