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DIGITALISATION AS A MODERN TREND IN THE DEVELOPMENT OF FINANCIAL MANAGEMENT IN SMALL BUSINESS

ABSTRACT

The article explores the digitalisation of financial management in small businesses in Ukraine, examining key trends and priority challenges. Poland is chosen for comparative analysis, as it is close to Ukraine in terms of economic and geographical factors, and also has a fairly successful experience of digitalisation. It is determined that the integration of digital solutions contributes to increasing the level of transparency of financial activities, reducing transaction costs and minimizing the impact of the human factor. A mathematical model is proposed to assess the impact of the level of digitalization on the efficiency of financial management, determining the relationship between investments in digital technologies, the level of process automation and the financial results of an enterprise. The key performance indicators, such as ROI (return on investment in digitalisation), changes in cash flows and reduction of operating costs due to automation, are estimated.

The article also examines the prospects for the development of digitalisation in the financial management of small businesses in the context of global economic trends and regulatory changes. It is found that the active use of digital financial solutions contributes to faster adaptation of enterprises to changing market conditions, improved interaction with customers and suppliers, as well as the creation of more flexible financial models that ensure long-term stability and development of small businesses in the digital economy.

It is revealed that the main barriers to digitalisation are high initial costs, lack of qualified personnel and the need to adapt to rapid technological changes. At the same time, it is determined that the development of digital transformation strategies, taking into account modern technological trends, allows small businesses to increase their competitiveness in a dynamic market environment. The results of the study may be useful for entrepreneurs, analysts and academics studying financial management in the digital economy.

Keywords: digitalisation, financial management, small business, digital technologies, automation, financial flows, ROI

JEL Classification: G32, M21, O33

INTRODUCTION

In today's transforming global economy, digitalisation is becoming a key factor in improving the efficiency of financial management in the small business sector. The introduction of digital technologies automates financial processes, increases transparency and speed of management decision-making, which is critical for the sustainable development of small businesses. In particular, digital platforms and financial technologies help to reduce transaction costs, simplify access to financial resources, and increase the competitiveness of businesses. Digitalisation has become a crucial factor in the development of modern business models, especially in the small business sector. The relevance of the research topic is due to the growing role of digital technologies in financial management, especially in the context of economic instability and an increasingly competitive environment. In Ukraine, the process of digitalising financial management is gaining strategic importance as it allows for adaptation to changing market conditions, enhancing the financial discipline of enterprises and facilitating their integration into

global economic processes. International experience shows that the level of digitalisation of financial management of small businesses varies depending on the level of development of financial infrastructure, access to modern technologies, and government policy to support digital transformation. In particular, a comparison between Ukraine and Poland is appropriate, as both countries have similar starting conditions, but Poland has made significant progress in introducing digital financial services due to active government support and a favourable regulatory environment.

LITERATURE REVIEW

Digitalisation as a modern trend in the development of financial management in small businesses is a relevant area of research, which is considered in numerous papers on digital transformation, innovation and financial management in small and medium-sized enterprises. Agostini & Nosella (2020) study the implementation of Industry 4.0 technologies in small enterprises, which is an important aspect of the digitalisation of financial management. Arroyabe et al. (2024) analyses the level of artificial intelligence adoption in European SMEs, emphasising the importance of digital capabilities for innovative development and the external environment. Åström et al. (2022) propose a three-phase model of value creation through AI-based business models.

The study by Belas et al. (2024) emphasises the role of financial management in the sustainable development of SMEs, while Bella et al. (2024) examines the prospects for digitalisation in German SMEs. Bokša et al. (2020) outline general trends in SME digitalisation, while Bouwman et al. (2019) examine the impact of digital business models on performance. Brodny & Tutak (2022) analyses the link between SME digitalisation and economic growth in the EU27, while Hasan et al. (2022) examine the digital transformation of small enterprises as a means of increasing competitiveness. Heider et al. (2021) explore business model innovation through dynamic capabilities in small enterprises.

Kilimis et al. (2019) analyses the digitalisation of SMEs in Brandenburg, while Kmecová et al. (2021) investigate the level of digitalisation of human resource management. Łobacz & Tyłzanowski (2022) examine the level of digitalisation of innovation practices in Polish SMEs, while Melo et al. (2023) analyse the impact of digital transformation on enterprise performance. Moeuf et al. (2020) identify critical success factors for Industry 4.0 in SMEs.

Pfister & Lehmann (2023) propose a methodology for assessing the success of digital transformation of German SMEs. Qadeer et al. (2025) analyses the role of the metaverse in the financial management of small enterprises, while Rachmawati (2025) investigates financial management in SMEs. Radicic & Petković (2023) examine the impact of digitalisation on technological innovation, while Seppänen et al. (2025) investigate the drivers of digital transformation in SMEs. Strilets et al. (2022) analyses government support for digitalisation in European countries, which is important for the implementation of digital solutions in the financial management of small enterprises. Surya et al. (2021) examine the economic growth and productivity of SMEs through open innovation. Telukdarie et al. (2023) analyses the opportunities and challenges of digitalisation in small enterprises. Wamba et al. (2017) study the impact of big data on enterprise performance, which is relevant in the context of financial analysis and planning. Thus, the analysis of the literature shows that the digitalisation of financial management in small businesses contributes to improving the efficiency of enterprises, their sustainable development and adaptation to changes in the market environment. The main areas of research are the impact of Industry 4.0 technologies, artificial intelligence, digital business models and anti-crisis financial mechanisms on the management of small enterprises.

AIMS AND OBJECTIVES

The purpose of the study is to identify the features of digitalisation of financial management in small businesses in Ukraine, assess its impact on the efficiency of financial management and identify promising areas of development based on international experience.

Objectives of the study:

- to analyse the theoretical foundations of financial management digitalisation;
- to study the current state of small business in Ukraine;
- to compare the key aspects of digitalisation of financial management in Ukraine and Poland;
- to identify the main problems and barriers to the introduction of digital technologies in the financial management of small businesses;
- to develop recommendations for improving the efficiency of financial management through digitalisation.

METHODS

The methodological approach to the study of the digitalisation of financial management in small business is based on the use of interdisciplinary methods of analysis, covering economic, financial and technological aspects.

The following methods have been used to achieve the set goals:

1. Theoretical analysis - a review of scientific sources on the digitalisation of financial management, including publications in scientific journals, monographs and reports of international organisations. Content analysis methods were used to systematise modern scientific approaches to the study of digitalisation in the financial sector.
2. System analysis - to determine the role of digital technologies in the financial management of small enterprises.
3. Comparative analysis - to study the experience of implementing digital financial instruments in different countries and small business sectors.
4. Economic and mathematical modelling to quantify the impact of digitalisation on the financial performance of small businesses.
5. Graphical modelling to visualise the results obtained.

The application of these methods allows for a comprehensive assessment of current trends in digitalisation in the financial management of small businesses and the development of practical recommendations for improving the efficiency of financial management through digital transformation.

RESULTS

The digitalisation of financial management is a multidimensional process that includes accounting automation, the use of digital payment systems, the use of cloud technologies, artificial intelligence and machine learning in financial forecasting processes. According to World Bank research [13], the digital transformation of the financial sector helps to reduce transaction costs, increase transparency of financial transactions, and improve access to financial resources for small businesses. In the context of small businesses, digitalisation can improve cash flow management, minimise risks and optimise decision-making processes. The use of ERP and CRM systems contributes to more effective monitoring of financial performance.

According to the State Statistics Service of Ukraine, in 2023, more than 60% of small businesses implemented digital financial instruments, including online banking, electronic document management, and financial analytical platforms. At the same time, the level of digital integration of small businesses lags far behind European standards due to a number of barriers, such as insufficient financial literacy, limited access to finance, and imperfect legal frameworks. The main factors contributing to the digital transformation of small business financial management in Ukraine are:

- the growing popularity of neobanks (Monobank, Revolut, Wise), which offer fast financial transactions without a physical presence in a bank;
- the spread of cloud-based accounting systems (Finmap, 1C) that simplify accounting and analytics;
- the use of blockchain technologies in digital payments and contracts.

At the same time, the challenges to the digital transformation of small business financial management include insufficient protection of digital financial transactions; high costs of implementing digital solutions; and uneven levels of digital maturity across regions.

In order to assess the prospects for the development of digital financial technologies in Ukraine, it is advisable to consider the experience of Poland and Germany. Poland is characterised by the active use of fintech solutions among small businesses due to government support for digital transformation (EU Digital Innovation Hubs programme). Germany, in turn, demonstrates a high degree of digital integration of business processes through the use of artificial intelligence and automated financial management systems.

Table 1. Key aspects of the comparison of digital transformation of financial management.

Country	Level of adoption of digital financial instruments	Government support	Key technologies
Ukraine	60% of businesses use online finance	Limited support	Online banking, cloud technologies
Poland	85% of businesses use digital finance	EU Digital Innovation Hubs	Fintech platforms, AI
Germany	90% of businesses have implemented digital solutions	High support	AI, automated ERP systems

The high level of digitalisation of small businesses in Poland is driven by access to EU grant programmes and the active development of fintech start-ups. In Germany, government initiatives such as Digital Strategie 2025 are aimed at supporting digital solutions in the financial sector, enabling small businesses to effectively integrate technology into financial management. Taking into account international experience, Ukraine needs to develop the following areas of digitalisation of small business financial management:

1. Expanding state support - creating financial support programmes for the digital transformation of small businesses.
2. Promotion of financial literacy - educational initiatives on the use of digital financial instruments.
3. Integration of AI and big data - automation of financial planning and forecasting.
4. Development of cybersecurity - improving the protection of financial data and transactions.

Table 2 analyses the number of operating small and micro enterprises by type of economic activity in Ukraine in 2010-2023, which reflects the dynamics of small business development in various sectors of the economy. The analysis of changes in the number of enterprises allows us to identify general trends in the development of small and microenterprises, as well as their sustainability and adaptability to challenges. A decline or increase in the number of businesses can be attributed to macroeconomic conditions, including economic crises, tax policy, war, and digital transformation. The growth of digital technologies affects the efficiency of financial management in small businesses. The analysed data show that different industries respond differently to economic changes. For example, the trade sector has experienced significant fluctuations, which may be a result of the digitalisation of sales and the shift to e-commerce.

Table 2. Number of operating small and micro enterprises by type of economic activity in Ukraine in 2010-2023. (Source: calculated by the authors according to the State Statistics Service of Ukraine)

Sector	Years	Small entrepreneurship entities		Of which micro-entrepreneurship entities	
		Units	In % to the total of business entities of the corresponding type of economic activity	Units	In % to the total of business entities of the corresponding type of economic activity
Total	2010	2161999	99	2093688	95.9
	2011	1679902	98.7	1608819	94.5
	2012	1578878	98.7	1510776	94.4
	2013	1702201	98.9	1637180	95.1
	2014	1915046	99.1	1859887	96.3
	2015	1958385	99.2	1910830	96.8
	2016	1850034	99.2	1800736	96.5
	2017	1789406	99.1	1737082	96.2
	2018	1822671	99.1	1764737	95.9
	2019	1922978	99.1	1864013	96
	2020	1955119	99.1	1898902	96.2
	2021	1937827	99.1	1880858	96.1
	2022	1716977	99.1	1671558	96.5
	2023	1898385	99.2	1853874	96.9
	Change, %		87,81	100.2	88.55

(continued on next page)

Table 2. Continued.

Sector	Years	Small entrepreneurship entities		Of which micro-entrepreneurship entities	
		Units	In % to the total of business entities of the corresponding type of economic activity	Units	In % to the total of business entities of the corresponding type of economic activity
Agriculture	2010	76863	95.7	72421	90.2
	2011	58191	94.7	52654	85.6
	2012	65313	95.4	59671	87.1
	2013	68105	95.9	62419	87.8
	2014	72756	96.2	66258	87.6
	2015	76720	96.8	71649	90.4
	2016	72095	96.6	66905	89.7
	2017	74184	96.9	68819	89.9
	2018	73998	97	68492	89.7
	2019	73131	96.9	67627	89.6
	2020	71195	97	65753	89.6
	2021	68659	97	63051	89.1
	2022	51555	96.7	46622	87.5
	2023	61460	97.6	56851	90.3
Change, %	79,96	101.99	78.5	100.11	
Industry	2010	145454	95.7	133443	87.8
	2011	115794	94.7	103356	84.5
	2012	107738	94.5	95526	83.8
	2013	115211	95	103322	85.2
	2014	126342	96.1	116414	88.5
	2015	130167	96.3	120859	89.4
	2016	122146	96.1	112582	88.6
	2017	118837	95.9	108685	87.7
	2018	120656	95.9	109676	87.1
	2019	124956	95.9	113882	87.4
	2020	121108	95.9	110470	87.4
	2021	116570	95.7	105812	86.9
	2022	97985	95.6	88976	86.8
	2023	109917	96.3	101235	88.7
Change, %	75,57	100.63	75.86	101.03	
Wholesale and retail trade	2010	1192849	99.6	1171734	97.9
	2011	917006	99.5	895851	97.2
	2012	838790	99.5	819534	97.2
	2013	886662	99.6	868657	97.5
	2014	985378	99.7	970587	98.2
	2015	986108	99.7	974347	98.5
	2016	907536	99.7	894778	98.3
	2017	834696	99.6	820933	98
	2018	814886	99.6	799238	97.7
	2019	830658	99.6	815330	97.7
	2020	822680	99.6	808221	97.8
	2021	773845	99.6	758939	97.6
	2022	658211	99.6	647074	97.9
	2023	711572	99.6	700243	98
Change, %	59,65	100	59.76	100.1	

An analysis of the dynamics of the number of operating small and microenterprises in Ukraine in 2010-2023 (Table 2) shows significant fluctuations in the sectors of the economy under study. The total number of small enterprises decreased

by 12.19% over this period, and microenterprises by 11.45%. Trade remained the most stable sector, where the share of small enterprises in the total number of business entities remained almost unchanged (99.6% in 2023 compared to 99.6% in 2010). At the same time, industry and agriculture saw a significant decrease in the number of enterprises (by 24.43% and 20.04%, respectively), which may be a result of macroeconomic changes, military operations, and unstable market conditions.

The distribution of the share of microenterprises in the overall business structure shows a gradual increase in their role in the economy. In 2023, more than 96% of small businesses in most sectors of the economy were microenterprises. This fact confirms the general trend towards the structural transformation of businesses towards flexible and technologically adapted business models, which is an important trend in the digital age. The results obtained indicate the need for further digitalisation of financial management in small businesses as a key factor in ensuring its competitiveness. The use of modern financial technologies (fintech solutions, automated financial management systems, online platforms for accounting and cost forecasting) will help to improve business efficiency, especially in an unstable economic environment.

The analysis of Figure 1 shows the volume of products (goods, services) sold by small businesses in Ukraine and is an important element of the study of the impact of digital technologies on financial management in small businesses.

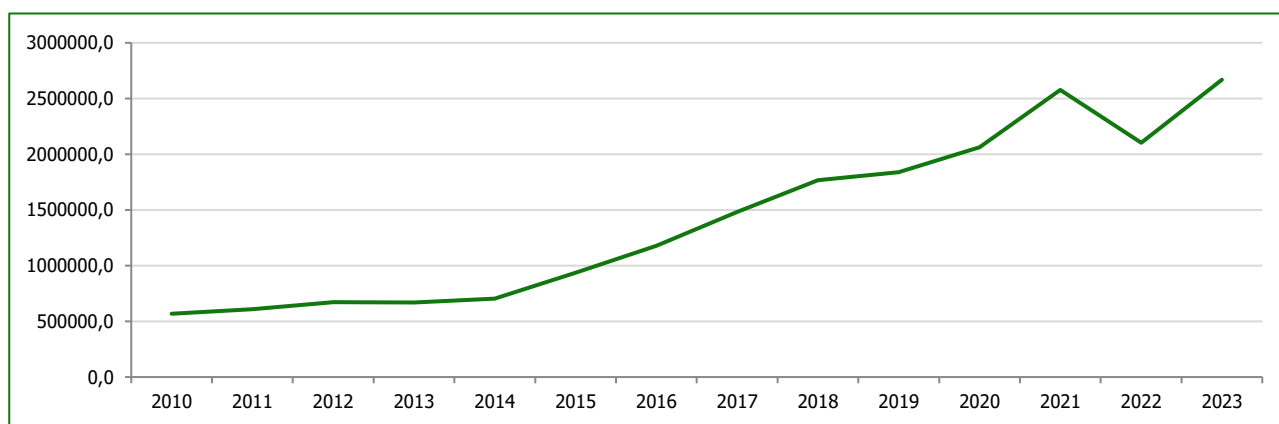


Figure 1. The volume of products (goods and services) sold by small businesses in Ukraine, UAH million. (Source: calculated by the authors according to the State Statistics Service of Ukraine)

An analysis of the dynamics of the volume of products (goods and services) sold in 2010-2023 shows a gradual increase in the indicator, reflecting both general macroeconomic trends and the impact of modern technological transformations. In particular, since 2015, there has been a significant acceleration in growth rates, which coincides with the active development of digital tools in the field of financial management of small businesses. The increase in sales in 2016-2021 may be due to the introduction of digital platforms for managing financial flows, the use of online payments, automated accounting systems, and CRM solutions. However, in 2022, there was a temporary decline in sales, which may be explained by macroeconomic and socio-political factors. At the same time, in 2023, there was a record growth, which may indicate the effective adaptation of business to modern conditions due to digitalisation.

Table 3 shows trends in the development of financial management in small businesses.

Financial management development trend	Description	Expected impact on small businesses
Use of artificial intelligence (AI)	Automation of data analysis, forecasting of financial indicators	Reducing costs and improving decision-making
Big Data and analytics	Use of large data sets for financial planning	More accurate forecasting and optimisation of resources
Integration of blockchain technologies	Increased transparency of financial transactions	Reduced fraud risks and increased trust
Development of FinTech platforms	Use of online banking, digital payments and lending	Simplifying access to financial services
Cybersecurity and data protection	Implementation of modern security standards in financial systems	Reducing the risk of cyberattacks and protecting confidential information
Automation of accounting	Using cloud services for financial accounting	Reducing human error and mistakes
Smart contracts	Use of self-executing contracts in business operations	Simplify transactions and reduce legal fees

Table 4 shows the features of digitalisation of financial management in small businesses in the example of Ukraine and provides a comparative analysis with Poland.

Table 4. Features of digitalisation of financial management in small business.			
Indicator	Ukraine	Poland	Commentary
Level of adoption of financial technology (FinTech)	Medium	High	Poland has a developed FinTech ecosystem that facilitates the digitalisation of financial management
Access to online banking for small businesses	High	High	Both countries have a high level of online banking usage among small businesses
Government initiatives to support digitalisation	Limited	Significant	Poland has a number of programmes in place to support digital transformation of businesses
Integration of artificial intelligence into financial management	Low	Medium	Poland is ahead of Ukraine in implementing AI solutions for financial analysis
Automation of financial accounting	Medium	High	Poland has more automated platforms for small business financial accounting
Cybersecurity in the financial sector	Medium	High	Poland has better cybersecurity standards for financial institutions

The digitalisation of small business financial management in Ukraine is undergoing active development, but there is significant potential for improvement compared to Poland. The main areas of development include the introduction of FinTech solutions, the expansion of government initiatives, and the strengthening of cybersecurity in the financial sector. Table 5 shows the main barriers to the digitalisation of small business financial management.

Table 5. Key barriers to the digitalisation of small business financial management.			
Main barriers to digitalisation	Ukraine	Poland	Ways to overcome them
High cost of implementing digital technologies	High	Medium	State subsidies, grant programmes
Insufficient digital literacy of entrepreneurs	High	Low	Training courses, online academies
Limited availability of digital financial instruments	Medium	Low	Expansion of FinTech services, government support
Cybersecurity threats	High	Medium	Implementation of international cybersecurity standards
Lack of investment in digitalisation	High	Low	Tax incentives for IT investments

The financial management of small businesses is a key factor in ensuring their sustainability and competitiveness in today's economy. Given the limited financial resources, small businesses need to implement effective financial management methods based on scientific approaches and modern analysis tools. The growing instability of the market environment, increased competition and global economic challenges necessitate the search for new financial management strategies that can adapt enterprises to changing business conditions.

The scientific basis for the development of financial management of small businesses is based on a combination of classical financial theories and innovative approaches, including the digitalisation of financial processes, the application of forecasting models and the use of automated analysis and control systems. The introduction of modern digital technologies helps to optimise financial flows, minimise risks and improve the operational efficiency of small businesses. In addition, the use of analytical methods for assessing the financial condition allows not only to improve the level of management decisions but also to ensure strategic planning of business development based on quantitative indicators and factor analysis.

Figure 2 shows a diagram of the scientific basis for the development of financial management in small business.

An important aspect of the study of financial management of small businesses is to take into account international experience and adapt best practices to the specifics of the national market. In particular, an analysis of the effectiveness of financial strategies in developed economies allows us to identify optimal financial management mechanisms that can be

applied in domestic small businesses. In the context of economic uncertainty and global crises, the need to develop scientifically sound financial models for small businesses is of particular relevance, as such models provide an opportunity to predict risks, rationally use resources and increase business resilience to external challenges. Thus, the study of the scientific basis of financial management of small businesses is necessary for the formation of effective management decisions aimed at strengthening the financial stability of enterprises, ensuring their innovation capacity and sustainable development in the modern economy.

To further explore this topic, the author proposes a mathematical model that reflects the relationship between digital technologies and the effectiveness of financial management in small businesses. The model includes several aspects, including assessment of the impact of digitalisation on financial performance, optimisation of financial flows and implementation of digital tools.

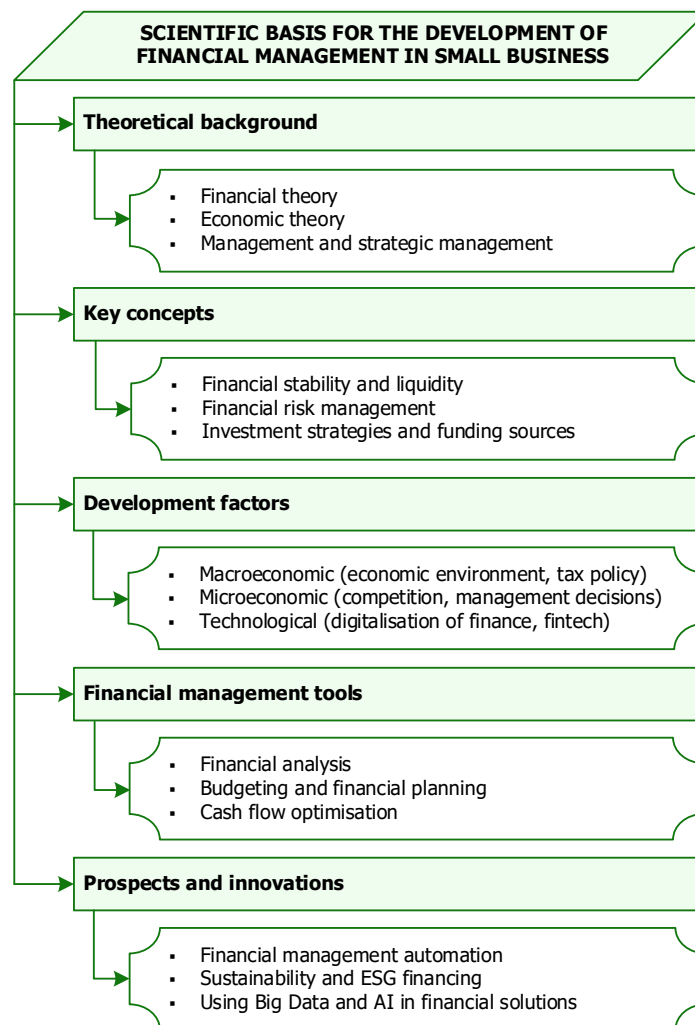


Figure 2. Scientific basis for the development of financial management in small business.

Assessment of financial management efficiency through digital technologies.

Let E_f be the effectiveness of financial management, which depends on the quantity and quality of digital tools implemented in business processes:

$$E_f = f(D_t, I_t, A_t),$$

where: D_t – level of digitalization (quantity and quality of digital technologies used in business); I_t – investments in digital technologies (costs for implementing new technologies); A_t – staff adaptation to digital tools (percentage of employees trained).

Digital cash flow forecasting model.

This model uses a function that describes changes in a company's cash flows based on digital investments:

$$C_t = C_{t-1} + \Delta C_t(D_t, I_t),$$

where: C_t – cash flow at a point in time t ; $\Delta C_t(D_t, I_t)$ – change in cash flow due to digital investments and the level of digitalization.

This change can be modelled through a linear function:

$$\Delta C_t(D_t, I_t) = \alpha_1 D_t + \alpha_2 I_t,$$

where: α_1 and α_2 – coefficients reflecting the impact of digitalisation and investment on cash flows.

A model of cost optimisation through the automation of financial processes.

The introduction of digital tools to automate financial processes reduces E_{cost} management costs.

$$E_{\text{cost}} = E_{\text{initial}} - \Delta E_{\text{cost}}(A_t, D_t),$$

where: E_{initial} – initial costs of financial management before the implementation of digital technologies, $\Delta E_{\text{cost}}(A_t, D_t)$ – change in management costs due to automation, depending on the adaptation of staff and the level of digitalisation.

The cost change function looks like this:

$$\Delta E_{\text{cost}}(A_t, D_t) = \gamma_1 A_t + \gamma_2 D_t$$

where: γ_1 and γ_2 – coefficients characterising the efficiency of adaptation and the level of digital tools.

Assessment of ROI (Return on Investment) from the implementation of digital technologies.

For small businesses, an important indicator is to assess the return on investment in digital technologies:

$$ROI = \frac{G_t - I_t}{I_t},$$

where: G_t – total profit of the enterprise after the implementation of digital technologies; I_t – Costs of implementing digital technologies.

The function of digitalisation implementation efficiency.

It is also advisable to build an integrated function that combines all these aspects and allows you to assess the overall effectiveness of digitalisation in small businesses:

$$E_{\text{total}} = \beta_1 \cdot E_f + \beta_2 \cdot C_t + \beta_3 \cdot E_{\text{cost}} + \beta_4 \cdot ROI,$$

where: $\beta_1, \beta_2, \beta_3, \beta_4$ – coefficients that determine the weight of each element in the overall assessment.

The proposed model allows not only to analyse the impact of digitalisation on various aspects of financial management but also to find optimal strategies for small businesses in the digital economy. The scientific value of the proposed mathematical model lies in its ability to integrate several aspects of digitalisation and financial management within a single analytical tool. It is advisable to identify several key aspects of the scientific value of this model:

1. Interdisciplinary approach. The model combines the theoretical foundations of financial management, economics, and digital technologies, which allows building an integrated system for analysing and forecasting financial processes in small businesses. This approach promotes the development of interdisciplinary research, where mathematical modelling is used to study economic and technological interrelationships.

2. Integration of digital tools into financial management. The proposed mathematical model allows to determine the relationship between the level of digitalisation and the efficiency of financial processes. This model uses key financial indicators (cash flows, costs, ROI), which allows to quantify the effectiveness of digitalisation in small businesses. This integration of digital tools into financial management opens up opportunities for more accurate measurement and forecasting of the impact of technological innovations on the financial sustainability of enterprises.
3. Quantifying the impact of digitalisation on costs and profits. The proposed model provides an opportunity to build functions that allow assessing the economic feasibility of investments in digital technologies. In particular, the ROI (Return on Investment) function allows to quantify the return on investment in technological innovations. The ROI indicator is critical for strategic decision-making by small businesses, as it allows them to find out how efficiently resources are used and what financial results can be expected from such investments.
4. Optimisation of financial flows and automation. The model contains a cost optimisation component through the automation of financial processes, which is an important element in the context of digitalisation. The use of mathematical functions such as $\Delta E_{cost}(At, Dt)$ allows for analysing changes in costs and cash flows arising from the implementation of automated systems.
5. Forecasting financial results based on digital technologies. The model also provides for forecasting financial results using numerical functions that take into account various factors, including the level of digitalisation (Dt) and investment in technology (It). This calculation makes it possible not only to assess the current state but also to predict the future development of the financial condition of the enterprise, which is important for strategic planning.

The proposed model is an example of the development of economic modelling in the context of digital business transformation. This mathematical model expands theoretical approaches to the analysis of financial processes by introducing new tools for analysing and optimising business processes. The proposed model is also of considerable practical value, as it provides small businesses with a tool to assess the effectiveness of digital technologies, optimise costs and improve financial sustainability.

DISCUSSION

The conducted analysis confirms that digitalisation represents a transformative trend with far-reaching implications for financial management practices in small and medium-sized enterprises. The findings align with the growing consensus in the academic literature that the integration of digital technologies fosters increased financial transparency, real-time decision-making, and enhanced resilience to market volatility (Bouwman et al., 2019; Brodny & Tutak, 2022). These benefits are particularly salient in the context of SMEs, which often lack the economies of scale and organisational robustness of larger firms.

Several studies underscore the importance of digital capabilities as a core determinant of successful financial management transformation. Arroyabe et al. (2024) highlight the synergy between digital maturity, innovation orientation, and the external regulatory environment in shaping SMEs' capacity for AI integration in financial processes. Similarly, Seppänen et al. (2025) emphasise that organisational culture and leadership commitment are key antecedents of successful digital transitions within managerial functions, including finance.

The adoption of Industry 4.0 technologies, as explored by Agostini and Nosella (2020), reveals divergent trajectories across sectors and regions, suggesting that the contextual embeddedness of SMEs significantly mediates digitalisation outcomes. Notably, Bella et al. (2024) draw attention to the German SME sector's trajectory, where strategic policy support and access to funding mechanisms have catalysed digital transformations, including those targeting financial control and accounting systems.

In parallel, the research confirms that digitalisation fosters business model innovation, which in turn reconfigures financial management structures (Åström et al., 2022; Heider et al., 2021). Through enhanced data flows and automation, SMEs can optimise cash flow forecasting, cost analysis, and investment planning. Nonetheless, challenges remain. Studies such as Moeuf et al. (2020) and Telukdarie et al. (2023) point to barriers including digital skill gaps, cybersecurity concerns, and financial constraints limiting deeper adoption.

Moreover, digital transformation processes have been linked with increased sustainability in financial decision-making, particularly when integrated with corporate social responsibility and human capital strategies (Belas et al., 2024). Digital tools enable more accurate environmental, social, and governance (ESG) reporting, which is increasingly relevant for accessing sustainable finance channels.

An emergent frontier involves the role of immersive and intelligent technologies—such as the Metaverse—in reshaping traditional financial operations. Qadeer et al. (2025) explore how virtual environments may offer novel platforms for financial planning, client engagement, and real-time simulations, although such innovations remain nascent within the SME domain.

In sum, the discussion illustrates that digitalisation is not a monolithic process but rather a multi-dimensional evolution shaped by technological readiness, strategic orientation, human capital, and institutional frameworks.

CONCLUSIONS

Digitalisation is a key trend in the development of financial management of small businesses, which helps to increase the efficiency of financial processes, reduce costs and improve access to financial resources. Based on the analysis of the experience of Poland and Germany, the article proposes directions for the digital transformation of the financial sector of small businesses in Ukraine. The implementation of the proposed initiatives will help to increase the competitiveness of small enterprises and their integration into the global digital economy. The proposed mathematical model is not only a tool for theoretical study of the impact of digitalisation on financial management but also has significant practical value for small businesses seeking to adapt to new technological conditions and improve their financial efficiency. It is the basis for further research and development of recommendations for strategic financial management in the digital economy.

Further research into the digitalisation of small business financial management will focus on several key areas. It is necessary to expand the analysis of the impact of digital technologies on various aspects of financial management, including strategic planning, risk forecasting, and liquidity management. An important area is the development of adaptive models that take into account the specifics of small businesses in various sectors of the economy. Attention should be paid to empirical studies aimed at assessing the real effect of digitalisation on the financial performance of small businesses in different countries and economic conditions. This analysis will help identify the most effective practices and adaptation strategies for small businesses in the context of digital transformation.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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The Authors declare that there is no conflict of interest.

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ДИДЖИТАЛІЗАЦІЯ ЯК СУЧАСНИЙ ТРЕНД РОЗВИТКУ ФІНАНСОВОГО МЕНЕДЖМЕНТУ У МАЛОМУ БІЗНЕСІ

У статті досліджено роль диджиталізації як ключового тренду розвитку фінансового менеджменту у малому бізнесі. Проаналізовано вплив цифрових технологій на фінансові процеси підприємств, зокрема на управління грошовими потоками, оптимізацію витрат, автоматизацію бухгалтерського обліку та фінансового прогнозування. Визначено основні фактори, що стимулюють цифрову трансформацію, серед яких інтеграція хмарних технологій, використання штучного інтелекту та впровадження блокчейн-рішень у фінансовій діяльності.

Стаття досліджує диджиталізацію фінансового менеджменту у малому бізнесі в Україні, розглядає ключові тренди та першочергові виклики. Для порівняльного аналізу обрана Польща, оскільки вона є близькою за економічними та географічними факторами до України, а також має достатньо успішний досвід диджиталізації. Визначено, що інтеграція цифрових рішень сприяє підвищенню рівня прозорості фінансової діяльності, зниженню транзакційних витрат та мінімізації впливу людського фактора. Запропоновано математичну модель, яка дозволяє оцінювати вплив рівня цифровізації на ефективність фінансового менеджменту, визначаючи взаємозв'язок між інвестиціями у цифрові технології, рівнем автоматизації процесів та фінансовими результатами підприємства. Оцінено ключові показники ефективності, такі як ROI (рентабельність інвестицій у цифровізацію), зміни у грошових потоках та зменшення операційних витрат за рахунок автоматизації.

Також у статті розглянуто перспективи розвитку диджиталізації у фінансовому менеджменті малого бізнесу в контексті глобальних економічних тенденцій та регуляторних змін. Виявлено, що активне використання цифрових фінансових рішень сприяє швидшій адаптації підприємств до змінних ринкових умов, покращенню взаємодії з клієнтами та постачальниками, а також створенню більш гнучких фінансових моделей, що забезпечують довгострокову стабільність та розвиток малого бізнесу в цифровій економіці.

Виявлено, що основними бар'єрами на шляху цифровізації є високі початкові витрати, нестача кваліфікованих кадрів та необхідність адаптації до швидких технологічних змін. Водночас визначено, що розробка стратегій цифрової трансформації з урахуванням сучасних технологічних трендів дозволяє малим підприємствам підвищити свою конкурентоспроможність у динамічному ринковому середовищі. Результати дослідження можуть бути корисними для підприємців, аналітиків та науковців, що досліджують питання фінансового менеджменту в умовах цифрової економіки.

Ключові слова: диджиталізація, фінансовий менеджмент, малий бізнес, цифрові технології, автоматизація, фінансові потоки, ROI

JEL Класифікація: G32, M21, O33