Economics and Business Management

16(4), 111-130
Journal homepage: https://economicscience.com.ua/en
Received: 27.05.2025 Revised: 23.10.2025 Accepted: 27.11.2025

UDC 005.3:004:658 DOI: 10.31548/economics/4.2025.111

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Instruments for forming an adaptive and competitive enterprise management system in the context of digital transformation

Abstract. The purpose of this study was to identify priority directions for improving the enterprise management system, taking into account the challenges of the digital environment and the need to ensure a sustainable competitive position in the market. Within the scope of the research, a comparative analysis of digital maturity assessment methodologies was conducted,

Suggested Citation:
Balanovska, T., Havrysh, O., Gogulya, O., Dramaretska, K., & Voskolupov, V. (2025). Instruments for forming an adaptive and competitive enterprise management system in the context of digital transformation. *Economics and Business Management,* 16(4), 111-130. doi: 10.31548/economics/4.2025.111.

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and the dynamics of the implementation of enterprise resource planning systems, customer relationship management systems, and business intelligence solutions in the corporate sector of Ukraine during 2020-2024 were examined. Particular attention was paid to the analysis of internal organisational changes, including the adaptation of management models to the level of digital maturity, the development of employees' digital competencies, and the formation of a digital management culture. The results of the study indicated that in 2024, 15.2% of enterprises already used ERP systems, while 5.2% applied artificial intelligence, and more than 83% employed customer relationship management systems. It was found that the implementation of digital solutions made it possible to increase profitability by 1.3-1.6 times and to reduce customer churn by half. From a regional perspective, the highest level of digital activity was observed in Lviv, Dnipropetrovsk, and Odesa regions, where the digital maturity of enterprises reached 0.8 on the scale. It was also established that digital culture and flexible management models (Scrum, Agile, Lean) were being actively implemented: 66% of companies applied Scrum, while the productivity of Agile teams increased by 25%. Within the Chief Digital Transformation Officer Campus programme, 440 digital transformation leaders were trained in 2024 alone. The practical significance of the study lies in the fact that its results could be used by enterprises to develop an adaptive management system aligned with their level of digital maturity, enhance the effectiveness of decision-making, and ensure long-term competitiveness in the digital economy

Keywords: innovation; competitiveness; management; managerial processes; digitalisation; digital competencies

INTRODUCTION

The rapid development of digital technologies is significantly transforming the operating environment of enterprises, presenting new requirements for management systems. The conditions of globalisation, intensified competition, and increasing dependence on digital infrastructure are changing traditional approaches to business process organisation. Enterprises striving for sustainable development are compelled to implement innovative solutions that ensure adaptability, prompt decision-making, and improved management efficiency. The transition to digital management models, based on the use of information systems, data analytics, process automation, and the development of employees' digital competencies, is becoming of particular importance.

The need to adapt management systems to the conditions of the digital economy necessitates a rethinking of the functions, roles, and tools of modern management. This issue is highlighted in the work of A. Zaverbnyj *et al.* (2024), which analyses the impact of digital technologies on the transformation of organisational processes. The study concluded that the use of information systems contributes to enhancing the efficiency of management decisions and increasing the adaptability of companies. The integration of digital technologies into business activities has generated growing interest among researchers due to the necessity for enterprises to adapt to the conditions of an unstable economic environment and rapid technological changes. The digital transformation of management processes, the use of cloud solutions, automation, big data analytics, and the creation of new business models were the subjects of study by I.V. Perevozova *et al.* (2024), who demonstrated that the implementation of digital solutions significantly increases productivity, promotes cost optimisation, and improves management decision-making.

The insufficient effectiveness of traditional management models in the face of rapid changes and globalisation pressures has led to the adoption of modern approaches. This issue is addressed in the work of V. Zelic *et al.* (2023), where it is substantiated that the application of data analytics, artificial intelligence, blockchain technologies, robotic automation, and cloud solutions contributes to the optimisation of business processes, increased transparency of management, and enhanced decision-making efficiency. The authors demonstrated that digitalisation creates new opportunities for

enterprise development, particularly through the personalisation of communications and the flexibility of business models. The growing role of digital technologies in management necessitates a reconsideration of approaches to business process organisation, the formation of new competencies, and the transformation of the market interaction model. This issue is explored in the work of O.V. Alekseeva *et al.* (2024), which analyses the impact of digitalisation on enterprise operations and identifies the key factors for the successful implementation of digital solutions. The authors concluded that the use of cloud services, automated management systems, artificial intelligence tools, and digital platforms enables companies to enhance flexibility, adaptability, and competitive positioning.

The low effectiveness of traditional approaches to management organisation in the context of digital transformation necessitates a revision of the methods used by enterprises to maintain competitive advantages. The work of V. Varga (2020) examined the peculiarities of digitalising management processes and proposed a conceptual model for implementing digital tools within the strategic management system. The author demonstrated that digital technologies enable increased labour productivity, improved information processing, and greater flexibility in decision-making. Particular attention was given to the role of digital competencies among managers and the formation of a new organisational culture. The need to enhance management effectiveness in the context of digital transformation requires a deeper understanding of the role of information technologies in supporting the strategic goals of enterprises. This issue is addressed in the study by G.M. Chepurda & E.S. Adamenko (2025), which analysed the main areas of digitalisation, including the implementation of automated management systems, digital platforms, and business analytics. The authors concluded that the use of such tools contributes to improved coordination of internal processes, increased accuracy of management decisions, and the formation of a digital culture within companies. The work emphasises that digitalisation is not merely a technical process but requires a comprehensive revision of organisational structure and management approaches.

The complexity of adapting enterprises to changes associated with digitalisation calls for a reassessment of management functions in the new environment. In the work of O.V. Taranych (2020), the possibilities of implementing digital technologies to improve management efficiency, particularly in decision-making, planning, and control, were explored. The author substantiated the importance of digital transformation as a tool for increasing organisational flexibility and highlighted the advantages of integrating intelligent systems into management processes. It was shown that digitalisation fosters the development of new leadership models, increases the role of digital competency among staff, and promotes the development of adaptive strategies. The insufficient effectiveness of traditional management systems in the context of digital transformation requires the implementation of new approaches to the organisation of enterprise activities. The study by T. Hrinka (2023) analysed the impact of digitalisation on increasing competitiveness, particularly through improving organisational structure, the use of cloud technologies, digital document flow, Customer Relationship Management (CRM) systems, and automated solutions. The author demonstrated that the application of digital tools contributes to increased productivity, ensures the promptness of management decisions, and creates conditions for the development of an innovative culture. Special attention was given to the specifics of digital transformation in small businesses, which requires an individualised approach to technology selection.

At the same time, the issues of quantitative assessment of the effectiveness of digital transformation, the impact of digital changes on strategic management, the adaptation of small businesses, the formation of digital culture and flexible management models, as well as the integration of digital technologies into long-term planning, considering the level of digital maturity of enterprises, remain insufficiently explored. The aim of this study was to justify the necessity of adopting new approaches to enhancing the enterprise management system, one that can flexibly adapt to market changes throughout the digital transformation process and foster long-term competitive advantages. To accomplish

this objective, the following tasks were outlined: to analyse the impact of digital tools on the organisational structure, functions, and management efficiency within an enterprise; and to provide a rationale for the development of an adaptive management model that ensures both flexibility and technological integration in contemporary conditions.

MATERIALS AND METHODS

The conducted research was of a theoretical and practical nature, with its temporal boundaries covering the period from 2020 to 2024. The study aimed to define the essence and evolution of management approaches in the context of digital transformation in enterprises. A review of scientific literature on the digital transformation of management was carried out. For this purpose, the works M. Shehadeh *et al.* (2023), A.A. Vărzaru & C.G. Bocean (2024), J. Chukwunweike & O. Aro (2024) were selected, which are distinguished by an interdisciplinary approach, a focus on digital strategies, and a deep analysis of the transformations of management processes in various sectors. These sources enabled the formulation of an approach to defining the key elements of a competitive management system, such as the presence of a digital strategy, a flexible organisational structure, integrated Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), and Business Intelligence (BI) solutions, the development of digital competencies, and the formation of a digital culture.

To assess the level of digital maturity of enterprises, a number of leading international methodological approaches were applied, allowing for a comprehensive comparison across various industries. In particular, the Deloitte (n.d.) digital maturity model, the BCG (n.d.) (Boston Consulting Group) index, and the Capgemini (n.d.) model were used. Additionally, the models of PwC (n.d.) (PricewaterhouseCoopers) and the ISO-oriented model (Certiget, n.d.) were also employed. The study focused on key indicators such as the degree of automation of business processes, the level of integration of digital solutions (ERP, CRM, BI), the development of digital culture, the presence of IT infrastructure, staff competencies in digital technologies, and the innovative capacity of enterprises. These indicators enabled the analysis of the level of digital integration in management processes and the identification of priority areas for adaptation to new digital challenges. Particular attention was given to the dynamics of digital investments in the corporate sector of Ukraine between 2020 and 2024. Statistical and analytical sources on digital transformations in the corporate sector of Ukraine were reviewed. Specifically, data from the NISS (2024a; 2024b) report and statistical materials from the Government portal (2025) were used to analyse the dynamics of digital investments, the cloud security market, and the pace of business analytics implementation. Within the descriptive method, the functional capabilities of BAS ERP (n.d.) (Business Automation Software Enterprise Resource Planning) and SAP ERP (n.d.) (Systems, Applications and Products in Data Processing) systems were analysed, including examples of their practical use.

In particular, BAS ERP was examined in the context of its implementation in companies such as Joint Stock Company (JSC) Motor Sich (n.d.), Private Joint Stock Company (PJSC) "Pharmaceutical firm 'Darnytsia'" (n.d.), and PJSC MHP (n.d.). By contrast, SAP ERP has been implemented in PJSC DTEK Kyiv grids (n.d.), JSC Ukrainian railways (n.d.), and JSC "National Joint Stock Company 'Naftogaz of Ukraine'" (n.d.). Special attention was given to the Ukrainian-produced ERP system IT-Enterprise (n.d.), which demonstrated effectiveness in large-scale manufacturing, particularly in the agricultural sector. The criteria for selecting these companies were: industry coverage (manufacturing, energy, transportation, pharmaceuticals, and agriculture), the scale of transformation, and the availability of analytical data. At the final stage of the study, scenario forecasting methods were applied based on the collected statistical data. The level of digital maturity of enterprises was taken into account, allowing for the modelling of potential scenarios of digital transformation up to 2030.

RESULTS AND DISCUSSION

The theoretical and methodological foundations of modern management system formation in the context of digital transformations

Enterprise management in the digital age is undergoing a fundamental transformation that

encompasses not only the tools of management but also the principles of management system design, leadership style, and decision-making logic. Traditional management models, developed during the industrial era, were based on hierarchy, rigid division of functions, and centralisation of power. As the complexity of the external environment increased and digital technologies were introduced, these models began to lose their effectiveness, leading to the emergence of new management approaches focused on adaptability, speed, flexibility, and customer centricity. The essence of modern management lies in the ability of an organisation to quickly respond to changes, create added value through innovation, operate in conditions of constant uncertainty, and make data-driven decisions. Digitalisation radically changes management principles, as digital technologies become both the subject and the tool of managerial influence. At the core of the new management paradigm are digital platforms, cloud services, artificial intelligence, big data analytics, automated management systems, and remote team management. The evolution of management approaches has gained qualitatively new content with the advent of digital management concepts, which focus on the transformation of processes, structures, and corporate culture within enterprises. Initially, digital tools were predominantly used in operational activities: automation of accounting, production processes, logistics, etc. Gradually, information and communication technologies (ICT) began to be implemented in strategic planning, performance analysis, human resource management, and customer interaction, which provided grounds to speak about the transition to data-driven management (Vărzaru & Bocean, 2024).

Modern management theories, such as agile management, design thinking, lean approach, and platform management, actively integrate digital technologies into their practices. In the context of digitalisation, categories such as flexibility, decision-making speed, decentralisation, self-organisation of teams, openness to experimentation, and innovation management become increasingly significant. Real-time communication, digital transparency, and the personalisation of employee influence create a new form of interaction between management and staff, distinct from classical administrative models. The digital transformation of management involves not only technological renewal but also a rethinking of the manager's role. Whereas the primary functions of a manager were once control and planning, today they act as facilitators of change, strategists, and analysts. A digital leader must possess a high level of digital literacy, be able to work with digital platforms, manage multifunctional teams that can work asynchronously, and assess the risks associated with digital innovations (Chukwunweike & Aro, 2024).

A competitive management system in the context of digital transformation is the result of integrating modern technologies, strategic thinking, analytical tools, and effective interaction among all levels of the enterprise. Its effectiveness is determined by the ability to respond swiftly to changes in the market environment, ensure sustainable development dynamics, and maintain competitive advantages in the long term. The formation of such a system requires an understanding of its key elements, which must function synchronously and complement each other. The first and one of the defining elements is strategic management, based on the principles of digital adaptability. This involves having a clear mission, vision, and a flexible strategy that considers digital trends, consumer needs, new business model formats, and technological potential. Such a strategy must be adaptable to rapid changes, include built-in mechanisms for updating, and anticipate scenario planning, allowing for effective action in conditions of uncertainty. The second important element is the institutional management structure, which must be decentralised, adaptive, and open to change. This means delegating authority, creating flexible management teams, applying project management principles, and using digital communication platforms. A modern management system must eliminate excessive bureaucracy, ensure decision-making speed, and create conditions for internal entrepreneurship. The next element is the knowledge management system and analytical decision support. Collecting, storing, processing, and utilising internal and external information in digital format enables informed decision-making

based on data. Big Data analytics, Business Intelligence (BI), Key Performance Indicators (KPI) monitoring systems, and forecasting become the foundation for decisions that enhance management effectiveness and ensure competitiveness. Another key element is the digital culture and human resource management system. Human capital remains the leading driving force of transformations, but to implement digital strategies, it is necessary to create an environment that fosters openness to innovation, learning, and experimentation. Human resource management should be based on the principles of digital literacy, the development of new competencies, particularly in analytics, working with platforms, project management, and cybersecurity (Shehadeh *et al.*, 2023).

Equally important components are the processes of interaction with clients and external partners. A competitive management system must ensure the establishment of sustainable relationships with target groups, the implementation of CRM systems, omnichannel communication strategies, service automation, and service personalisation. This increases consumer satisfaction, fosters loyalty, and creates added value in supply chains. The infrastructural component of the management system includes ERP systems, document management systems, cybersecurity services, cloud platforms, digital storage, and process automation technologies. A high level of integration of digital solutions enables cost optimisation, reduces time spent on operations, enhances transparency in management, and ensures the scalability of the business model. Thus, a competitive management system for an enterprise in the digital age is a comprehensive architecture that encompasses strategic planning, analytics, an adaptive organisational structure, innovative personnel, digital infrastructure, and effective interaction with the external environment. Its main task is to ensure a sustainable competitive advantage in a dynamic environment and the digital economy (Darvidou, 2024).

In the process of transforming modern enterprises, digital maturity has become a key indicator that reflects the organisation's ability to adapt to technological changes, integrate digital solutions at all levels of management, and enhance the effectiveness of its operations. To determine the actual level of digital maturity, methodologically grounded approaches need to be applied, taking into account a comprehensive set of characteristics: from organisational structure to technological readiness and the culture of innovation. In practice, there are several recognised models that offer systematic methods for evaluating the digital transformation of enterprises. Table 1 presents the main methodological approaches used to assess digital maturity.

Table 1. Methodological approaches to assessing the digital maturity of enterprises

Methodological approach	Key assessment components	Type of assessment
Deloitte digital maturity model	Strategy, technologies, processes, culture, structure, leadership	Qualitative and quantitative
BCG digital transformation index	Digital strategy, leadership, innovation, customer interaction	Quantitative (scoring system)
Capgemini digital maturity model	IT infrastructure, organisational culture, business models, customer experience	Combined (survey + data)
PwC digital maturity assessment	Technologies, operations, people, structure, leadership	Questionnaire + analytics
Integrated ISO-standards model	Processes, resources, digital competencies, compliance with criteria	Quantitative based on compliance indicators

Source: compiled by the authors based on Deloitte (n.d.), BCG (n.d.), J. Bravo-Jaico *et al.* (2025)

As shown in Table 1, the key approaches share common components – strategy, technologies, culture, and structure – yet differ in terms of methodology and depth of analysis. For example, the Deloitte (n.d.) model combines both quantitative and qualitative methods, allowing for a balanced view of the current state of digital transformation. The BCG (n.d.) index is primarily used for quick assessments of changes and the development of digital transformation roadmaps. Capgemini (n.d.) focuses on the integration of digital tools into business models and the management of customer experience. The PwC (n.d.) model, based on in-depth surveys and subsequent analysis, helps identify specific barriers and drivers of change. The ISO-oriented model (Certiget, n.d.) is the most regulated, enabling enterprises to assess the alignment of their internal processes with international standards for digital maturity. In summary, it can be noted that the effectiveness of using any given methodology depends on the research objectives, the scale of the company, and the industry specifics. None of the models is universal; however, their combination can provide a comprehensive understanding of the maturity level and assist in developing a well-founded digital development strategy. Therefore, applying a structured approach to diagnosing digital maturity is an essential condition for building a competitive management system in the digital economy.

The study by R. Rostamzadeh *et al.* (2024) and the present research shared a common idea – the recognition of digital transformation as a key driver of change in management; however, they differed in focus. In R. Rostamzadeh *et al.*, the emphasis was placed on social customer relationship management (SCRM), while this study focused on the comprehensive modernisation of the enterprise management system. Both approaches highlighted the importance of data analytics, cloud technologies, and the significance of decentralisation, adaptability, and the digital competencies of staff. At the same time, R. Rostamzadeh *et al.* explored in greater depth the impact of social media, customer emotions, and brand crisis management, whereas these aspects were only outlined in the present study. In the work of A. Shen *et al.* (2024), digital transformation was interpreted as a strategic tool for the development of the digital economy, but within the context of government policy and the formation of a competitive environment in the field of cloud computing. The main focus was on institutional support for digital innovations, the effectiveness of policies, and the assessment of market outcomes. In contrast, this study examined the internal organisational changes related to the digitalisation of the enterprise management system. A common feature of both works is the emphasis on a strategic approach, the importance of investment in digital infrastructure, and digital maturity; however, the difference lies in the scale of the analysis: the macro level in A. Shen *et al.* contrasts with the micro level in the present work.

The results presented in the study by R. Ouyang *et al.* (2024) also address the impact of digital technologies on management processes, albeit in a narrower context – the formation of China's digital economy. The authors primarily examined digitalisation through the lens of Industry 4.0, automation of production chains, and the development of smart platforms. Accordingly, the main focus of the analysis was on industry ecosystems, digital infrastructures, and technological modernisation of production. In contrast, this study focused on the managerial tools of digitalisation, as well as organisational restructuring. A commonality is the emphasis on technological innovations as a source of competitive advantage; however, the conceptual approaches differed – from the sectoral industrial model to the cross-functional transformation of business processes. Meanwhile, the study by T. Luque-Martínez *et al.* (2024) was aimed at exploring digital transformation in Spain's educational sector. The emphasis was placed on the formation of digital identities for universities, the shift in consumer models in education, and the rethinking of branding strategies in the digital economy. Special attention was given to digital platforms, personalised experiences, visual storytelling, and emotional interaction analytics. In contrast, this research examined the structural transformation of management in commercial enterprises, covering automation, integration of digital management systems, and changes in organisational culture. The common conclusions emphasised the importance

of digital competency, strategic vision, and an innovative environment as key prerequisites for successful digitalisation. In the work of F. Xue *et al.* (2024), the interaction between innovation strategy, digital transformation, and the competitiveness of manufacturing enterprises in China was analysed. The authors studied the impact of the external institutional environment, political incentives, and market conditions on enterprises' activities in digital innovations. These approaches contrast with the present study, where the analysis of digital transformation was predominantly internally focused – through changes in management structure, the digitalisation of business processes, and the formation of a digital culture at the enterprise level. Both works equally recognised the importance of strategic flexibility, investment in digital tools, and the need to develop human capital, yet they differed in the scale and direction of analysis.

In the study by I. Benedetti *et al.* (2025), digital transformation was primarily viewed not only as an internal process of improvement but also as part of a broader innovation ecosystem. The authors paid particular attention to open innovations, digital entrepreneurship, and the significance of inter-organisational interactions. In contrast, within this study, the focus shifted to the internal restructuring of management processes – specifically, the automation of functions, adaptation of structures, and development of digital competencies among staff. Thus, while both approaches unanimously emphasised the importance of strategic vision, digital culture, and professional expertise, I. Benedetti *et al.* focused more on the external relations of the enterprise, whereas this study focused on internal organisational transformations. Similarly, in the work of E.M. Martinelli & A. Tunisini (2024), digital transformation was analysed through the lens of changes in inter-organisational interactions, particularly in the realm of business-to-business (B2B) communications. The researchers emphasised the concept of relational strategising as an adaptive mechanism to the new conditions of the digital environment. In contrast, this study primarily examined internal management aspects: organisational structure transformation, digital integration, and adaptive leadership. Both approaches utilised the analytical framework of strategic management, but applied it in different contexts: E.M. Martinelli & A. Tunisini in the inter-organisational context, while this study at the level of internal processes.

Equally notable was the study by P. Datta *et al.* (2020), in which digital transformation was presented as a driving force for the rethinking of organisational business models. The authors emphasised the creation of new consumer value, which, in turn, required the transformation of service chains and innovations in customer interactions. On the other hand, this study focused more on internal changes that ensured management flexibility, process alignment, and increased efficiency. It is worth noting that both approaches acknowledged the importance of technological infrastructure and data; however, in P. Datta *et al.*, the conceptual dimension prevailed, while this study was dominated by the applied analysis of organisational practices. As for the study by T. Nakamura (2024), it undoubtedly demonstrated a profound understanding of digital transformation at the corporate strategy level within the context of the Japanese economy. The author focused on the role of digital innovations, flexible structures, and organisational learning, thus forming a macroeconomic view of the transformations. In comparison, this study had a distinctly micro-applicative character and focused on the internal adaptation mechanisms: digitalisation of management, changes in communication approaches, and modernisation of the functional structure. Despite the difference in scale, both studies converged on the thesis regarding the need to rethink the role of leadership and update management paradigms in the digital age.

In the work of X. Han *et al.* (2024), digital transformation was viewed through the lens of the resource-based approach, with a clear focus on logistics and e-commerce. The authors argued that the integration of digital resources into supply chains, as well as the role of organisational culture, were key factors in enhancing efficiency. Meanwhile, this study focused primarily on the transformation of management structures within enterprises. Both approaches undoubtedly shared the idea of the necessity of combining technological innovations with

organisational adaptation. However, while in X. Han *et al.* the focus shifted towards the external environment in which enterprises operate, in this case, the key analytical object was the internal management system. Between 2020 and 2024, the digital transformation of Ukraine's corporate sector acquired a systemic nature and demonstrated high dynamics, even in the face of deep socio-economic challenges.

In the study by N. Durão *et al.* (2024), digital transformation was viewed as a phased process, with a focus on strategic management, data integration, and interdepartmental interaction. Similarly, in this study, digitalisation was interpreted as a gradual internal adaptation, but with an emphasis on implementing specific solutions (ERP, cloud services, analytics). Both approaches recognised the importance of digital culture, leadership, and human capital, although N. Durão *et al.* emphasised external competitiveness, while this study focused on the internal transformation of processes. Meanwhile, in the study by D. Ellström *et al.* (2021), digital transformation was examined through the lens of changes in manufacturing companies in Northern Europe, with a focus on organisational flexibility, the development of digital skills, and employee training. Similar emphasis was placed in this study, where the role of adaptive management and internal digital modernisation was also highlighted. However, D. Ellström *et al.* primarily focused on industrial enterprises and the cultural barriers to transformation, while this study covered a broader inter-industry context, analysing the economic effects of implementing digital solutions. Therefore, both approaches recognised the significance of digitalisation, but differed in the scale of analysis and applied focus.

The approaches of Ö. Larsson & P. Wallin (2020) recognised the special importance of digital transformation for enhancing business flexibility, as well as the role of strategic approach, knowledge management, and digital competencies of staff. At the same time, Ö. Larsson & P. Wallin focused on the concept of open strategising – involving a wide range of participants in the formation of digital strategy in industrial companies in Sweden. In contrast, the Ukrainian study focused on internal management changes, the implementation of digital systems, and the adaptation of business processes. The study by E. Boffa & A. Maffei (2024) and the analysed research shared the common recognition of the key role of digital transformation in strengthening the competitiveness of manufacturing enterprises. In both works, digitalisation was viewed as a driving force for changing management approaches, modernising processes, and strategic renewal. However, the focus of E. Boffa & A. Maffei study was on evaluating the maturity of digital initiatives in Italian industrial companies, particularly in the context of Industry 4.0, using a structured analytical approach to determine the level of digital integration. They emphasised the importance of technological infrastructure, leadership support, and organisational readiness for change.

Digital transformation radically changes approaches to managing enterprises, placing flexibility, analytical thinking, innovation, and the integration of digital technologies into all levels of the organisational system at the forefront. The transition from a hierarchical model to decentralised management requires a new type of leadership, based on data, adaptability, and digital literacy. Building a competitive management system today is only possible with strategic thinking, a high level of digital maturity, and the ability to continuously update. These characteristics are becoming the key to sustainable business development in the digital economy.

Analysis of the impact of digitalisation on enterprise performance

Between 2020 and 2024, digital transformation in Ukraine's corporate sector demonstrated steady growth, despite significant challenges posed by the pandemic and full-scale war. Enterprises have increasingly implemented digital solutions to automate business processes, improve operational efficiency, and strengthen their market position. Investments in digitalisation varied across sectors: in most companies, they accounted for 1-5% of annual revenue, while in technology-intensive industries, they exceeded 20% (Nesenyuk, 2024). The greatest interest was generated by ERP systems, CRM solutions, cloud services, data analytics, and cybersecurity. A key catalyst for digital change has been electronic communication operators, including

PJSC Kyivstar (n.d.), PJSC VF Ukraine (n.d.), and Datagroup-Volia (n.d.), which, according to preliminary estimates, plan to invest about $6 billion in digital infrastructure from 2025 to 2030, equating to approximately $850 million annually just within the telecom sector. This creates conditions for accelerating the digitalisation of the entire corporate environment through the development of Fifth Generation networks, expanding access to high-speed internet, and improving information technology (IT) infrastructure (NISS, 2024a). Companies are also placing significant focus on cybersecurity – in 2024, the cloud security market in Ukraine grew to $1.7 million, three times higher than pre-war levels. The use of resource and customer relationship management systems has significantly increased: according to 2024 data, 53% of domestic companies used CRM solutions, while another 33% employed international systems. This has enabled enterprises to enhance flexibility, adaptability, and management efficiency in a turbulent environment (NISS, 2024b).

At the same time, the business analytics segment was also developing: about 15.2% of companies used tools for big data processing and forecasting, which enabled them to respond more accurately to market changes and consumer trends. Regionally, the highest levels of digital activity were recorded in Dnipropetrovsk, Lviv, and Odesa regions (up to 0.8 on the digital maturity scale) (Government portal, 2025). Overall, more than 85% of enterprises had stable internet access, although in some regions, this figure remained unstable due to damaged infrastructure. Thus, the dynamics of digital investments and the implementation of ICT in Ukraine's corporate sector indicate a clear trend towards digital maturity. In 2021, 89% of companies declared the presence of digital transformation goals in their strategic plans, and 44% rated their digital preparedness as high or very high. Investments by telecommunications operators, the active implementation of ERP and CRM systems, and the growing demand for cybersecurity and analytics – all of these confirm the irreversibility of digital transformation in Ukrainian business (EBA, 2021).

Between 2020 and 2024, the Ukrainian corporate sector demonstrated active digital transformation, implementing innovative tools to enhance business efficiency and resilience. ERP systems play a key role in the digital transformation of Ukrainian businesses, particularly in large and medium-sized enterprises. They provide centralised management of various aspects of company operations – from finance and logistics to customer and employee interactions – which significantly improves transparency, control, and the efficiency of business processes. The most widely used solution in the Ukrainian environment is BAS ERP (n.d.). This system was specifically adapted to Ukrainian legislation, accounting practices, and tax reporting, making it popular among enterprises seeking to automate daily operations with minimal localisation costs. In JSC Motor Sich (n.d.), BAS ERP is integrated into the management of production processes, which has reduced the production cycle time and introduced end-to-end material flow planning. As a result, the enterprise has improved the efficiency of material and inventory accounting and reduced defects. Private Joint Stock Company "Pharmaceutical firm 'Darnytsia'" (n.d.) uses BAS ERP for managing prescription calculations, ensuring compliance with GMP requirements, tracking product batches, as well as quality control and supply chain management. This has allowed the company to integrate all functional blocks into a unified digital system, which is critical for an industry with high regulatory demands (BAS ERP, n.d.). Another widely implemented solution is SAP ERP (n.d.). This system is designed for large corporations with complex structures, providing comprehensive management of the enterprise, including production processes, financial reporting, procurement, analytics, and Human Resources (HR). PJSC DTEK Kyiv grids (n.d.) uses SAP ERP to integrate financial accounting, logistics, equipment maintenance management, and energy balance management, enabling the company to promptly analyse costs and plan production resources at the holding level. JSC Ukrainian railways (n.d.) uses SAP ERP for automating procurement processes, asset accounting, personnel management, and finance: the system covers over 60,000 users across Ukraine and ensures centralised control over strategic processes. In JSC "National Joint Stock Company

'Naftogaz of Ukraine'" (n.d.), SAP ERP is used for managing the resources of subsidiary companies, including in energy, gas transportation, and financial flow accounting, which allows the consolidation of data from different divisions and enhances management transparency (Naftogaz of Ukraine, 2019).

Another powerful solution is Oracle E-Business Suite (n.d.), which provides comprehensive integration of various functions: accounting, project management, supply chains, and human resources. Successful examples of this system's implementation include PJSC Kyivstar**,** JSC Ukrtelecom (n.d.), and JSC Oschadbank (n.d.), where the system serves as a tool for improving operational efficiency and automating complex business processes. For instance, after implementing Oracle E-Business Suite and related solutions such as Oracle Exadata Database Machine**,** PJSC Kyivstar reduced operational costs by approximately 15% through the unification of IT systems and business processes, while the performance of financial and analytical systems increased by 3-5 times, significantly speeding up data processing for billing and reporting. For medium and large businesses, the Microsoft Dynamics 365 (n.d.) solution, which combines ERP and CRM functions, is also attractive. This platform is used by leaders in the Ukrainian retail and logistics markets, including Limited Liability Company (LLC) Epicenter (n.d.), LLC Rozetka (n.d.), and LLC New Post (n.d.), enabling them to provide a high level of service personalisation, inventory control, logistics, and marketing campaigns in a unified environment (Rubryka, 2024). In particular, at LLC New Post**,** Microsoft Dynamics AX 2012 R3 currently serves over 600 employees in Kyiv and Poltava. The implementation of this ERP system has automated nearly two dozen financial processes, integrated logistics and accounting workflows, and ensured the generation of comprehensive reporting in accordance with international standards, thus enhancing the transparency of the company's operations and management control (OntargIT, n.d.).

Equally important for Ukrainian businesses is the national ERP system IT-Enterprise (n.d.), which covers the full cycle of resource and production management. It has been implemented in leading Ukrainian companies such as PJSC MHP (n.d.) – the largest agricultural holding in Ukraine, and JSC Motor Sich (n.d.) – a key player in the machine engineering industry. In addition to IT-Enterprise, MHP has implemented the SAP S/4HANA system along with associated products (CRM, Ariba, MDG (Master Data Governance), SuccessFactors, vZoo), which cover all key areas – from agricultural production to finance and HR. Tools for Big Data are systematically used, particularly in the vZoo project for poultry farming management based on artificial intelligence and analytics using Azure DWH (Azure Data Warehouse). In crop production, a geoinformation platform has been developed, which digitised over 130,000 land plots and 3,000 fields, ensuring control over fertiliser application, yield forecasting, and monitoring of diseases and pests. Thanks to digital solutions, PJSC MHP was able to recover up to 30% of technical losses in agricultural production, which demonstrates a significant improvement in management efficiency (UNN, 2021).

In the pharmaceutical sector, an example of digital leadership is PJSC "Pharmaceutical firm 'Darnytsia'" (n.d.), which, in 2024, entered the top 30 most digitised companies in Ukraine. The company uses ERP solutions, big data, and artificial intelligence to elevate its business processes, particularly in logistics, quality control, and the transition from a manufacturing to a marketing, and later a patient-oriented, model. These tools not only enable optimisation of supply chains but also reduce the time to market, ensuring competitiveness in challenging economic conditions (Mind, 2025).

CRM systems responsible for managing customer experience have been implemented in more than 80% of enterprises. In 2023, 83.7% of companies used CRM, and the share of Ukrainian solutions increased eightfold since 2021. The integration of CRM and ERP allows the consolidation of information about customers, finances, and inventory into a single system, facilitating more accurate supply chain and order management (Business. Diia, 2023). Cloud services are also being actively implemented. Solutions such as LBS Cloud (n.d.) or SAP Business ByDesign (n.d.) enable enterprises to avoid high costs for IT infrastructure. The popularity of

cloud services among small and medium-sized businesses is linked to their accessibility and the SaaS model, which does not require significant investments. The automation of business processes through RPA (Robotic Process Automation) helps minimise human errors, reduce costs, and compensate for staff shortages (Chernikov, n.d.). A positive correlation between the level of digitalisation and profitability is confirmed: digital solutions contribute to cost reduction, increased productivity, and improved customer interaction. This underscores the importance of continuing digital transformation across all sectors of the Ukrainian economy (Fintechinsider, 2025).

Overall, between 2020 and 2024, the digital transformation of Ukraine's corporate sector reached a qualitatively new level, gradually encompassing key functional and management processes within enterprises. The implementation of ERP and CRM systems, the development of cloud services, big data analytics, and RPA solutions became the foundation for enhancing business efficiency, transparency, and adaptability in the face of crisis challenges. Successful cases from companies such as PJSC MHP, PJSC DTEK Kyiv grids, PJSC "Pharmaceutical firm 'Darnytsia'", and LLC Rozetka confirm the practical potential of digital solutions across various sectors.

Tools for enhancing the competitiveness of management systems in a digital environment

In the context of the dynamic development of the digital economy, the implementation of modern digital management tools has become a key condition for enhancing the competitiveness of enterprises. This primarily involves the use of CRM, ERP, and BI systems, the development of a digital culture in management, the formation of digital competencies, and the adaptation of management models to the level of the enterprise's digital maturity. By the end of 2024, approximately 15.2% of Ukrainian enterprises were already using ERP systems, and only 5.2% were applying artificial intelligence in business (Nesenyuk & Melnyk, 2024). The demand for cloud, mobile, and intelligent solutions, including those with artificial intelligence (AI) integration, is increasing. It is expected that by 2030, approximately 60-70% of Ukrainian companies will switch to cloud-based ERP and CRM systems. This is facilitated by the policies of leading software providers such as Microsoft, which offers discounts of up to 80% on licences for Ukrainian companies. SaaS models are gaining preference due to their rapid updates, accessibility, flexibility, and high profitability (Kyivstar Business Hub, 2025).

The implementation of CRM and ERP systems allows companies to manage customer databases, orders, inventory, and finances more efficiently. Research shows that investments in CRM yield an average of $8.7 in revenue for every dollar invested, with a payback period of about one year. CRM solutions reduce customer retention costs by 15-20%, cut customer churn by half, and increase the efficiency of new product launches by 30%. Meanwhile, ERP systems contribute to reducing operational costs, optimising inventory, improving the accuracy of accounting, and enhancing the quality of management decisions. The expected average profit increase for companies that have implemented ERP/CRM systems is 1.3-1.6 times higher compared to those that do not use them (Wezom, 2021). The use of BI solutions in Ukraine is still not widespread. Only 7.5% of companies use BI systems with elements of artificial intelligence. However, among market leaders, the share of such companies reaches 60-70%. Generative AI, particularly ChatGPT, is actively integrated into business analytics: 21.3% of enterprises use it (Kyivstar Business Hub, 2025).

In this context, the digital culture of management takes on particular significance. In 2024, as part of the Chief Digital Transformation Officer (CDTO) Campus programme (CDTO, n.d.), 440 digital transformation leaders were already trained in Ukraine (CDTO Campus annual..., 2024). Initiatives by Diia. Education (n.d.) reach thousands of managers annually. This reflects a systematic increase in digital competencies within both the public and private sectors. The average budget for developing digital competencies is typically 1-2% of the company's annual revenue. The level of digital maturity among Ukrainian companies varies significantly across industries. The average digitalisation index is 56 out of 100 (KPMG, 2025). Digital maturity assessments in specific industries are presented in Table 2.

Table 2. Digital maturity assessment of enterprises by industry (2024)

Industry	Digital maturity (0-100)	Characteristics
IT	70-80	High level of innovation, full integration of AI, cloud, and analytics
Energy	50-60	ERP, BI implementation, but slow progress due to complex infrastructure
Machine engineering	40-50	Moderate digitalisation, limitations due to resources and regulation
Pharmaceuticals	45-55	Active implementation of quality control and analytics
Agriculture	30-40	Early stage: agricultural drones, analytics, isolated examples of digitalisation

Source: compiled by the authors based on KPMG (2025), Y. Polikovska (2025a), K. Mykhaylova (2025)

Overall, digital transformation in Ukraine is actively progressing. In the IT sector, it has reached a high level of integration, while in the agricultural sector and traditional industries, particularly in light, food, and mining industries, digitalisation is still in its early stages. The average digital maturity index for communities and regions is around 30 out of 100. The change in management models is directly linked to digital transformation. According to international and national studies, around 60-70% of companies undergoing digitalisation are transitioning to agile management models – Scrum, Agile, and Lean. Scrum is the most common: over 66% of companies implementing Agile approaches use it. Agile teams are 25% more productive, and 98% of companies report a positive impact on decision-making speed and process flexibility. Lean approaches are widely applied in manufacturing: they reduce order completion time, decrease waste, and increase efficiency (Schaefer, 2023). Thus, flexible management has already become an integral component of adaptive management in the digital age. This enables companies to adapt more quickly to market changes, implement innovations, and maintain competitiveness in an unstable environment.

It is expected that by 2030, the digital transformation of corporate governance in Ukraine will become systemic and will cover most medium and large enterprises. According to forecasts, more than 60% of such companies will actively use resource and customer relationship management systems – ERP and CRM – on a cloud-based platform. This will significantly reduce IT infrastructure costs, enhance the flexibility of business processes, and provide real-time data access. More than half of the companies plan to implement business intelligence (BI) systems with elements of artificial intelligence, which will facilitate deeper analysis of market trends, personalisation of customer experience, and more accurate financial forecasting (Polikovska, 2025b).

Management models are also undergoing changes: at least 70% of companies will transition to agile management methods (Agile, Scrum, Lean), which will ensure rapid adaptation to changes in the external environment, increase team productivity, and shorten decision-making cycles. In the context of these changes, the average level of digital maturity of Ukrainian businesses will rise to 75 out of 100 possible points, and the share of companies with a developed digital culture will exceed 60%. This not only signifies technical modernisation but also a shift in mental models, management approaches, and educational priorities in favour of innovation and continuous development. Digital tools in Ukraine are no longer just operational support – they are becoming the foundation of strategic competitiveness for companies. In the face of wartime and economic challenges, it is the comprehensive approach – from technical implementation to the transformation of mindset – that will ensure the resilience, adaptability, and leadership positions of Ukrainian enterprises in the digital economy (KPMG, 2024).

In conclusion, the implementation of digital management tools has become a defining factor in the transformation of Ukrainian enterprises towards greater flexibility, efficiency, and resilience. Data confirms the gradual growth of digital maturity, particularly in the IT sector, while other sectors demonstrate slower adaptation rates. Thus, in the context of the formation of

the digital economy, Ukrainian enterprises are increasingly integrating digital solutions at all levels of management. The implementation of ERP, CRM, and BI systems, the development of digital culture, and the transition to agile management models ensure a significant increase in business efficiency, adaptability, and competitiveness. However, the persistence of intersectoral disparities and low digital maturity in traditional sectors indicates the need for further systemic transformations. The transition to a comprehensive digital management model, which includes not only technical renewal but also a rethinking of leadership and organisational culture, is a key factor for success in the current economic environment.

CONCLUSIONS

Digital transformation has become a key factor in enhancing the competitiveness of Ukrainian enterprises in the context of an unstable economic environment. Between 2020 and 2024, businesses actively implemented ERP and CRM systems, cloud services, and business analytics, which significantly optimised business processes, reduced costs, increased management flexibility, and improved decision-making speed. For example, CRM solutions, used by over 83% of companies in 2023, helped reduce customer churn by half and increase profitability by 1.3-1.6 times. ERP systems, with BAS ERP playing a particularly important role, ensured the integration of finance, logistics, human resources, and production management, which was especially effective in companies such as PJSC MHP, JSC Motor Sich, PJSC "Pharmaceutical firm 'Darnytsia'", PJSC DTEK Kyiv grids, and others. Statistical data indicate a growth in digital maturity: the average digitalisation index of companies reached 56 out of 100, while in leading regions (Lviv, Dnipropetrovsk, Odesa regions), this figure reached 0.8 on the digital maturity scale. The demand for cloud technologies is increasing – by 2030, it is expected that 60-70% of companies will transition to cloud-based ERP and CRM systems, which will reduce IT infrastructure costs and provide greater mobility and accessibility. However, in 2024, only 5.2% of companies used artificial intelligence in business practices, although among technological leaders, this figure reaches 60-70%. Additionally, only 7.5% of enterprises have implemented BI solutions with AI elements, but this segment holds significant growth potential, particularly in the context of personalising customer experience and forecasting financial indicators. Flexible methodologies – Scrum, Agile, and Lean – play a critical role in shaping the new management model, already applied by 60-70% of companies undergoing digital transformation. This results in a 25% increase in team productivity and accelerates the decision-making cycle. The role of the manager is transforming from a function of control to a facilitator of innovative change, requiring new digital competencies and strategic thinking. In 2024, within the framework of the CDTO Campus programme, 440 digital transformation leaders were trained, and thousands of managers undergo training annually as part of the Diia. Education initiative.

Digital management culture is gradually becoming the norm – the budget for developing digital skills reaches 1-2% of a company's annual revenue. The shift in management paradigms from centralised to decentralised management, supported by the use of KPI, BI, Big Data, and cloud services, creates the foundation for a more resilient and competitive business model. It is estimated that by 2030, the average digital maturity index of Ukrainian companies may rise to 75 out of 100, and more than 60% of enterprises will have fully developed a digital culture. Thus, digital transformation in Ukraine not only modernises technical processes but also fundamentally changes the logic of management, leadership style, and market interaction, which becomes the basis for long-term competitiveness in the global digital economy. A limitation of this study was its focus primarily on the internal aspects of digital transformation within enterprises, without covering empirical data from small businesses and intersectoral comparisons. Future research prospects include a deeper analysis of the impact of digital strategies on business performance, the development of adaptation models for enterprises with low digital maturity, and the exploration of synergies between digital transformation and sustainable development.

ACKNOWLEDGEMENTS

None.

FUNDING

None.

CONFLICT OF INTEREST

None.

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Інструменти формування адаптивної конкурентоспроможної системи менеджменту підприємства в умовах цифрової трансформації

Анотація. Метою даного дослідження було виявлення пріоритетних напрямів удосконалення системи менеджменту підприємства з урахуванням викликів цифрового середовища та потреби забезпечення стійкої конкурентної позиції на ринку. У межах дослідження було проведено порівняльний аналіз методик оцінки цифрової зрілості, а також вивчено динаміку впровадження систем управління ресурсами підприємства, систем для управління взаємовідносинами з клієнтами та рішень для бізнес-аналітики у корпоративному секторі України у 2020-2024 роках. Основну увагу було приділено аналізу внутрішніх організаційних змін, зокрема адаптації управлінських моделей до рівня цифрової зрілості, розвитку цифрових компетенцій персоналу та формуванню цифрової культури управління. За результатами дослідження було встановлено, що у 2024 році 15,2 % підприємств уже використовують ERP-системи, тоді як 5,2 % – штучний інтелект, а понад 83 % – системи для управління взаємовідносинами з клієнтами. Було виявлено, що впровадження цифрових рішень дає змогу підвищити прибутковість у 1,3-1,6 рази, а також удвічі скоротити відтік клієнтів. У регіональному розрізі найвищий рівень цифрової активності фіксується у Львівській, Дніпропетровській та Одеській областях, де цифрова зрілість підприємств сягає 0,8 за шкалою. Також було встановлено, що цифрова культура та гнучкі управлінські моделі (Scrum, Agile, Lean) активно впроваджуються: 66 % компаній застосовують Scrum, а продуктивність

команд Agile при цьому зростає на 25 %. У межах програми Chief Digital Transformation Officer Campus лише за 2024 рік було підготовлено 440 лідерів цифрової трансформації. Практичне значення дослідження полягає в тому, що його результати можуть бути використані підприємствами для побудови адаптивної системи управління, яка відповідає рівню їх цифрової зрілості, підвищує ефективність прийняття рішень та забезпечує довгострокову конкурентоспроможність в умовах цифрової економіки

Ключові слова: інновації; конкурентоспроможність; менеджмент; управлінські процеси; цифровізація; цифрові компетентності