



A CATALYST FOR INNOVATION IN BUSINESS: ARTIFICIAL INTELLIGENCE IN E-COMMERCE DIGITAL TRANSFORMATION STRATEGIES

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ARTICLE INFO

Article History

Received: January 28, 2026

Reviewed: March 29, 2026

Accepted: April 29, 2026

Published: May 29, 2026

Keywords:

Artificial intelligence,
Business process optimization,
Management,
Efficiency,
E-commerce,
Digitalization,
Economy,
Innovation,
Result

ABSTRACT

Digital transformation is a determining factor in the development of the modern economy and a key vector of modernization of business processes in the field of e-commerce. Its relevance is due to the growing role of innovative technologies, in particular artificial intelligence (AI), in shaping the competitive advantages of enterprises. The purpose of the study is to examine the impact of digital transformation and artificial intelligence tools on e-commerce management strategies, and the object is e-commerce business processes in the digital economy. The theoretical basis of the work is the modern concepts of strategic management, innovative development and the digital economy. The study found that AI acts as a catalyst for business innovation, providing automation of key processes, personalization of consumer experience, and increasing the efficiency of marketing strategies and logistics. Using the example of world leaders, the article demonstrates that AI integration allows not only to optimize operating costs but also to form new business models based on predictive analytics and intelligent algorithms. The practical significance of the results lies in the identification of strategic guidelines for e-commerce enterprises seeking to adapt to the challenges of the digital economy, in particular in the implementation of customer-centered and innovative management strategies. This creates the basis for strengthening the competitiveness of businesses in both the domestic and global markets.



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I. INTRODUCTION

The digital transformation of various spheres of economic activity is increasingly becoming one of the main factors of economic development. It significantly influences business organization, management approaches, and ways of creating value for customers. While technological changes used to be gradual, nowadays, in the global competition, businesses are actually forced to quickly adapt to new digital conditions in order not to lose competitiveness. It no longer depends so much on the company's need to meet current trends as on its ability to exist in the market for the long term in the digital economy. E-commerce has become one of the most prominent manifestations of the digital economy. It is developing particularly rapidly and has actually become an integral part of consumers' daily lives. It is enough to mention how actively Ukrainians use mobile applications to order goods or services. It is no longer just a way to "buy online" but a whole system that influences the formation of new business models and even consumer behavior.

The role and pace of artificial intelligence development deserves special attention. Artificial intelligence is widely used in e-commerce. Algorithms generate personalized offers, predict demand, and optimize logistics. That is, AI works not only as automation but also as a tool that opens up space for innovation. Given this, the authors can say that future business models will increasingly be based on digital technologies. At the same time, rapid digitalization creates new challenges for the economy as a whole, which are at least related to cybersecurity, ethical aspects, and generally creates a need for flexible management approaches for companies. Therefore, the relevance of the study arises from the need to formulate strategic decisions that will ensure business adaptation to the digital economy and the use of AI as a driving force for innovative development. The purpose of the article is to study the impact of digital transformation on the development of e-commerce management strategies and to determine the role of artificial intelligence as a key catalyst for innovative business solutions. In accordance with this goal, the tasks are as follows: to substantiate the relevance of digital transformation and determine its impact on the development of e-commerce; to systematize the elements of e-commerce management strategy and key business processes in the digital economy; to explore the possibilities and results of integrating artificial intelligence into the business processes of leading e-commerce companies; to formulate generalized conclusions about the role of AI as a catalyst for innovation in e-commerce management strategies.

II. LITERATURE REVIEW

The analysis of recent scientific developments confirms that digital transformation has a dominant impact on the formation and updating of business strategies. This requires new approaches to the organization and management of business entities. In particular, the following studies have traced various aspects of understanding the concept of “digital business transformation”. For example, Sviatoboh [1] considers digital business transformation as a comprehensive change in business processes with an emphasis on digital platforms and provides a practical analysis of cases of Ukrainian enterprises. At the same time, the paper focuses more on the technological aspect and less on the managerial dimension. Another article by [2] emphasizes the role of strategic management in the processes of digital transformation. The systematization of tools for adapting businesses to the digital environment is valuable. However, the weakness of the study is the lack of attention to small businesses, which makes it difficult to apply the recommendations universally. By [3] analyze the impact of global e-commerce on the digital transformation of Ukrainian business. An important contribution is the comparison of international practices. However, the practical recommendations remain general and do not take into account the specifics of the domestic legal framework. In [4] emphasizes that in the digital economy, mass-produced goods lose their attractiveness, and therefore, trade enterprises are forced to form new competitive strategies based on technological trends and modern management tools. In particular, this scientific source focuses on systematizing competitive advantage factors, developing cross-functional teams, and assessing the digital maturity of business entities as the basis for effective digital business transformation. However, it should be noted that the proposed approaches remain methodologically unclear: there is a lack of detail in the concepts of “digital maturity” and “technological trends”, and there is no empirical evidence of the effectiveness of the recommended tools.

An equally significant contribution to Ukrainian science is the work of [5], which attempts to combine the concepts of digital transformation, artificial intelligence, and sustainable business development. However, the study is largely an overview and focuses on generalities without offering a clear methodological framework or factual evidence. Although the author rightly emphasizes the synergy between digitalization and the principles of sustainable development. The paper also lacks specific models for assessing the impact of AI on the efficiency of business processes and indicators of this sustainability. These advantages of artificial intelligence for corporate business seem to be universal and need to be studied in an industry or regional context. By [6], [7] identify three components of the digital economy: infrastructure, e-business, and e-commerce. Therefore, as a result of the literature review, it should be emphasized that researchers interpret digital business transformation as a multifaceted process that includes strategic, technological and managerial aspects. In particular, there is a tendency to consider the development of e-commerce and artificial intelligence as key drivers of change. Without detracting from the importance of any of the above works, the authors believe that most scientific works do not directly study digital transformation for the development of e-commerce management strategies and do not emphasize the role of artificial intelligence as a key catalyst for innovative business solutions.

III. METHODS

The study was conducted as part of a research effort to examine e-commerce management strategies in the context of the digital economy and business transformation processes. The empirical basis consisted of scientific publications, analytical reports from consulting companies, and statistical data (Statista). Additional empirical material was drawn from cases of artificial intelligence implementation in the activities of leading global companies (Amazon, Google, Alibaba, Netflix, etc.), which are widely covered in scientific and professional literature, as well as in business media publications. The methodological basis of the study is the provisions of modern theories of digital transformation, strategic management and innovative development. The methods of system analysis and generalization were used to identify key trends in e-commerce development, the method of comparative analysis to study the impact of AI on the business processes of leading companies, and the case study method to identify practical results of the implementation of innovative technologies. To structure the obtained data, tabular and graphical visualization methods were used, which allowed to integrate theoretical conclusions with the studied observations.

IV. RESULTS AND DISCUSSION

The analysis revealed that the digital transformation in e-commerce causes multilevel changes in strategic management, which directly depend on the integration of artificial intelligence. The results can be systematized in several key dimensions. Firstly, it was determined that the main drivers of change are consumer preferences, market trends, local specifics, and macroeconomic factors. They shape the demand for personalized experience, environmental friendliness, mobility, and flexible business models, which requires the active use of machine learning algorithms, predictive analytics, and intelligent management systems.

Secondly, studies of leading companies (Amazon, Netflix, DHL, etc.) have shown that AI reduces costs and contributes to the formation of new business models. For example, the use of recommendation systems increases customer retention, intelligent pricing algorithms ensure a balance between supply and demand, and logistics automation reduces delivery times and warehouse operations costs. Thirdly, the generalized model “factors → changes in e-commerce strategies” showed that the influence of external and internal conditions is translated into practical management decisions: from personalization of communications and development of mobile platforms to adaptation of global standards to local market realities and building anti-crisis strategies in unstable macroeconomic conditions. Fourth, the results of structuring strategic management elements confirmed that AI is an integrative tool that covers all levels: from mission and goal setting to human resources and corporate social responsibility. This indicates a shift to a new management paradigm where digital technologies and innovations determine the long-term competitiveness of the business. In general, the study results prove that the use of AI in the strategic management of e-commerce provides synergy between technological and organizational changes, forming the basis for the sustainable development of companies in the global digital environment. Let's start with the strategic aspect of digital business transformation. In particular, this is related to the defined vector of Ukraine's foreign policy towards joining the European Union. This implies, among other things, the formation of a set of effective measures aimed at integrating the national economic system into the single European space with the active use of digital economy tools.

In this context, the European Union [8] becomes an important benchmark, which defines digital harmonization as a top priority aimed at stimulating economic development through employment growth, improving the investment and innovation climate, strengthening competition, etc. The further development of this course is specified in the European Union Program [9], which outlines a set of measures to achieve the EU's digital, social and economic transformation. The technological aspect of the digital transformation of business is undoubtedly rooted in the dynamic development of information technology, which directly drives the intensive spread of e-commerce on a global scale. According to the European Commission [10] and the Statista portal [11], the growth of this market segment can be traced both in terms of its volume and the growth of profitability of entities operating in this area. In particular, the e-commerce market is expected to reach USD 3.66 trillion in 2025 [10], [11]. It is also projected to grow at a CAGR of 6.29% (2025-2030), leading to a projected market size of USD 4.96 trillion by 2030 [11]. The number of users in the e-commerce market is expected to reach 4.0 billion by 2030. User penetration will be 54.3% in 2025 and is expected to reach 56.4% by 2030. The average revenue per user (ARPU) is expected to reach USD 1.13 thousand [11]. According to the above trends, one of the key factors in the evolution of e-commerce is the rapid development of computer technologies and digital devices, which determines the pace and scale of transformation of this segment [11]. Therefore, e-commerce has become a crucial driver of the digital economy, especially in the context of the transition to a remote format with the onset of the Covid-19 pandemic and full-scale invasion, which have led to increased demand for adaptive and operational mechanisms for doing business.

E-commerce has covered a wide range of components, including e-commerce, e-money, digital banking, online insurance services, logistics platforms, marketing activities, payment services, digital consulting services, educational products, etc. The role of e-commerce in the economy is showing steady growth, and traditional approaches to business organization are gradually losing efficiency due to active digitalization and innovation. There is a need to reorient management to modern strategic and technological solutions that can optimize business processes and achieve the expected results. It should be noted that a key factor in this process is the intensive progress in the development of artificial intelligence, which not only increases the efficiency of companies but also becomes a catalyst for innovation in the formation of new management models and competitive advantages in the digital economy. Thus, the managerial aspect of digital business transformation should be viewed through the prism of the multifactorial impact of various environments on the development of e-commerce. In the process of substantiating e-commerce management strategies, it is necessary to take into account both internal factors (consumer preferences, market trends) and external factors (local specifics, macroeconomic conditions). This approach is consistent with the principles of systems analysis, as it makes it possible to identify the relationship between key elements of the environment, the integrated impact on business models, and the role of artificial intelligence in shaping innovative solutions. In this context, it is important to analyze the main components of e-commerce development factors, as shown in Table 1.

Table 1: Key factors of e-commerce development in the context of digital transformation and the impact of artificial intelligence.

Analytical aspect	Characteristics	Importance for e-commerce development
Consumer preferences	Focus on personalized shopping experience through the use of artificial intelligence; growing demand for environmentally friendly and sustainable products; active use of mobile devices for online shopping	Drives the need to implement AI solutions for personalization, development of mobile platforms, and adaptation of assortments to green trends
Market trends	Transformation of e-commerce towards individualization of customer experience; spread of AI tools in marketing and sales; environmental friendliness and mobility as demand drivers	Pushes businesses to adopt innovative management strategies and flexible models of customer interaction
Local specifics	Influence of socio-cultural, political and economic factors; interest in local products and support for regional identity; accelerated digitalization due to the military conflict; regulatory reforms in the field of consumer protection and digital payments	Determines the uniqueness of the Ukrainian market among the countries of the region; creates favorable conditions for the development of local brands and innovative business models
Macroeconomic factors	Inflation rate, stability of the hryvnia, purchasing power of the population; fiscal measures to support businesses; global challenges such as pandemics, supply chain disruptions, geopolitical changes; development of digital infrastructure and Internet penetration; public interest in sustainable development	Determines the pace and scale of digital transformation; stimulates business adaptation to economic instability and environmental challenges

Source: grouped based on Wu [12], Bartelt and Röser [13], Sjödin et al. [14], Gama et al. [15], Tsotsas [16].

As we can see, Table 1 lists the key factors that influence e-commerce. These factors confirm that the digital transformation of e-commerce is determined by the interaction of consumer, market, local, and macroeconomic factors, which together shape the need for the implementation of intelligent technologies and adaptive management strategies. Therefore, approaches to the formation of management strategies in this area should be changed and adapted. First, it concerns consumer preferences, which are focused on personalized experience and encourage businesses to actively implement artificial intelligence technologies that can provide individualized communications, dynamic pricing, and optimized assortment policy. As a result, the e-commerce management strategy should include deep integration of AI algorithms into customer interaction processes. Secondly, in terms of market trends, the growing role of digital commerce and demand for eco-friendly products necessitate that strategies be focused on digitalization and sustainability. Companies need to combine marketing and technology solutions that are consistent with the principles of sustainable development, while ensuring that mobile platforms are accessible and convenient. Thirdly, given the local specifics of the Ukrainian market, for example, which are driven by socio-cultural, political and economic factors, regional differences in consumer practices and the development of local brands should be taken into account. Management strategies should combine global digital standards with adaptation to local needs and regulatory environments, which will help to strengthen business confidence and competitiveness.

Finally, fourth, macroeconomic factors, such as currency market volatility, inflationary fluctuations, and the military context, necessitate flexible and sustainable management strategies. In such conditions, optimization of business processes and diversification of sales channels play a key role, which is also possible through the use of AI and analytical platforms to forecast demand and minimize risks. Thus, new strategic approaches to e-commerce management can be based on the integration of artificial intelligence as a catalyst for innovation, which ensures personalization, optimization, and increased efficiency of business models in the digital economy. Therefore, the results of the analysis show that the identified factors directly determine the transformation of management strategies in the e-commerce sector. In particular, as presented, they affect the nature of personalization of customer experience, ways of adapting business to socio-economic conditions, the level of flexibility of management approaches and the extent of use of innovative technologies. Accordingly, it is advisable to present a generalized model “factors → changes in e-commerce strategies” that allows us to trace how the key factors of digital transformation are translated into practical management decisions (Table 2).

Table 2: Factors and changes in e-commerce management strategies.

Key factor	Changes in e-commerce management strategies
Consumer preferences (personalization, mobility, environmental friendliness)	Integration of AI to personalize the experience, use of big data to create customized offers; emphasis on mobile platforms and green products in the assortment
Market trends (AI tools, mobile commerce, sustainable development)	Developing strategies focused on sustainability and mobility; combining marketing and technological innovations to increase customer engagement
Local specifics (socio-cultural, political and economic conditions, military context, support for local brands)	Adapting global business models to local needs; supporting regional identity and local producers; and complying with regulatory requirements
Macroeconomic factors (currency instability, inflation, global challenges, digital infrastructure)	Development of flexible and anti-crisis strategies; diversification of sales channels; use of AI analytics for demand forecasting and risk management

Source: systematized based on Statista [11].

As we can see, Table 2 demonstrates that key environmental factors are directly transformed into strategic business decisions, and the integration of artificial intelligence is a common feature of all management areas in the field of e-commerce. The above factors of e-commerce development in the context of digital transformation also show that strategic management in this area should be based on the integration of innovative technologies and adaptation to a multi-component environment. Consumer preferences create demand for personalized and environmentally friendly experiences, which requires the implementation of artificial intelligence and mobile platforms in the business model. Market trends reinforce the importance of artificial intelligence tools, mobile commerce, and sustainable development as key drivers of competitiveness. Local specifics, driven by socio-cultural, political, and economic factors, require companies to be flexible and preserve local identity. Macroeconomic conditions also highlight the need to develop crisis-proof and sustainable management strategies that can respond to currency volatility, inflation risks, and global challenges. Thus, effective management in e-commerce is only possible with a comprehensive combination of strategic and technological solutions that can use artificial intelligence as a catalyst for innovation and business efficiency. A systematic view of the e-commerce management strategy in the context of digital transformation requires consideration of its structural elements and relevant business processes. It is important that each of these processes is being transformed today under the influence of artificial intelligence, which acts as a catalyst for innovation. Thanks to machine learning algorithms, predictive analytics, marketing communications automation, and intelligent logistics management systems, AI ensures an increase in the efficiency, accuracy, and effectiveness of business operations. Thus, the authors can clearly see how digital technologies are being integrated into management practices, forming a new paradigm of e-commerce development, as shown in Figure 1.

Vision and development goals
Business processes: defining the company's mission and values; setting strategic goals (market growth, profitability, innovation).
Business model and positioning
Business processes: model selection (B2C, B2B, C2C, D2C); value proposition development; competitive advantage identification.
Target audiences and customer experience
Business processes: consumer segmentation; development of customer scenarios (customer journey); personalization of offers.
Marketing strategy and promotion channels
Business processes: omnichannel, mobile solutions, SMM; brand management; customer acquisition and retention tools.
Product range and management
Business processes: product category structure; pricing management (dynamic pricing, premium and budget segments); new product development.
Technological infrastructure
Business processes: e-commerce platforms (CMS, ERP, CRM); integration with marketplaces.
Logistics and operations
Business processes: organization of warehouse processes; delivery (domestic, international); partnership with logistics operators.
Financial management and monetization
Business processes: revenue model (sales, subscriptions, transaction fees); cost management; investment in innovation.
Data management and analytics
Business processes: Big Data and AI analytics; demand forecasting; KPI performance monitoring.
Innovation and development
Business processes: implementation of new technologies (AR/VR, chatbots, automation); adaptation to the digital economy; continuous improvement of UX/UI.
Organizational structure and personnel management
Business processes: competencies in the field of digitalization; training and development of personnel; formation of a team to work with innovations.
Social responsibility and safety
Business processes: personal data protection; environmental friendliness and sustainable development; ethical business standards.

Figure 1: Unification of the main elements and business processes of the e-commerce management strategy.

Source: [17-21].

Thus, the e-commerce management strategy combines marketing, technological, financial, logistics, and innovation elements, as a result, it ensures competitiveness in the digital economy. Modern research indicates that the integration of artificial intelligence into e-commerce is not only a tool for improving operational efficiency, but also a strategic factor in the long-term competitiveness of a business [12]. The use of AI covers different levels of strategic management – from setting goals and choosing a business model to optimizing customer experience, marketing strategies, data management, finance, and logistics [13]. This multidimensional integration allows companies to form flexible business models, adapt to market dynamics, and develop innovative approaches to customer interaction, as evidenced by research in the field of digital transformation and Big Data [14]. In addition, AI defines new guidelines for strategic development and changes the competitive environment on a global scale [15], [16]. Table 3 systematizes the key areas of AI application in the strategic management of e-commerce with examples of global companies that demonstrate the practical results of such a transformation.

Table 3: Integration of artificial intelligence into business processes and e-commerce management strategy.

Strategy element	Key business processes	Application of AI	Examples of companies and results	Source
Vision and development goals	Formation of mission and strategic guidelines; Setting KPIs and monitoring	Forecasting market scenarios; Intelligent dashboards for KPI control	Amazon – predictive analytics to adapt strategic goals, increase flexibility	Amazon Tech Blog
Business model and positioning	Competitor analysis; Format selection; Niche search	Trend and segment detection algorithms	Shopify – AI analytics to find niche segments, increase sales for new sellers	Shopify Official Reports
Target audiences and customer experience	Segmentation; Customer journey; Personalization	Recommendation systems; AI chatbots; ML forecasting	Netflix – more than 80% of views through personalized recommendations, increased customer retention	research.netflix.com
Marketing strategy	Content marketing; SMM; Omnichannel	Generative AI; Campaign optimization; Emotion analysis	Coca-Cola – AI for creative content, increasing the effectiveness of advertising campaigns	Coca-Cola Marketing Case Studies
Assortment and product management	Cataloging; Dynamic pricing; New product management	AI for pricing; Demand forecasting	Zalando – AI to manage prices and demand, reduce inventory costs	Zalando Financial Reports
Technology infrastructure	Platforms; CRM/ERP; Cybersecurity	AI for cybersecurity and integration automation	Microsoft Azure – AI for data monitoring and protection, incident mitigation	Microsoft Case Studies
Logistics and operations	Warehouse management; Delivery planning; Inventory control	Route optimization; Warehouse robotization	DHL – AI route optimization and shipment forecasting, faster deliveries	gobeyond.ai
Financial management	Revenue management; Cost control; Forecasting	AI for fraud detection; Budgeting automation	PayPal – AI to reduce fraud and speed up transaction processing	PayPal Tech Blog
Data management and analytics	Big Data; Demand forecasting; KPI analytics	AI analytics; Predictive models	Google – AI for analyzing big data and consumer trends	Google Research
Innovation and development	R&D; UX/UI testing; New technologies	AI for A/B testing; Idea generation	Airbnb – AI for UX/UI testing and demand forecasting	Airbnb Case Studies
Organizational structure and staff	Training; Team management; Competence development	AI for HR analytics; Personalized learning	Unilever – AI in candidate screening and reducing hiring time	Unilever HR Reports
Social responsibility	Data protection; ESG; Eco-friendly practices	AI for ESG monitoring and data protection	IBM Watson – ESG analytics and cyber defense	IBM ESG Reports

Source: grouped on the basis of Amazon Web Services [22], Shopify [23], Netflix Research [24], Coca-Cola Company [25], Microsoft [26], DHL [27], GoBeyond.AI [28], PayPal [29], Google Research [30], Airbnb [31], Unilever [32], IBM [33].

The summary in Table 3 shows that companies that implement artificial intelligence in various elements of their management strategy achieve synergy between technological efficiency, personalization of the customer experience, and long-term competitiveness. Also, an analysis of the key elements of e-commerce management strategy in the context of digital transformation shows that traditional approaches are gradually losing their effectiveness, giving way to innovative models focused on integrating artificial intelligence into business processes. Artificial intelligence acts as a catalyst for innovation, providing a new level of adaptability, flexibility, and efficiency for e-commerce strategies. The implementation of technologies for data mining, automation of management processes, personalization of user experience, and optimization of logistics operations allows companies to achieve significant efficiency and competitiveness gains. Examples of leading companies such as Amazon, Alibaba, eBay, Walmart, and Shopify demonstrate that the systematic use of AI not only optimizes operating costs but also creates unique competitive advantages by improving customer experience, forecasting demand, personalizing offers, and increasing service speed. Thus, a modern e-commerce management strategy should be based not only on the principles of digitalization and automation, but also on the active implementation of artificial intelligence as an integrative tool for innovative development. As a result, the use of AI in e-commerce management strategies allows achieving synergy between technology and business, which becomes the basis for sustainable growth and the formation of a new competitive paradigm in the digital economy.

V. CONCLUSION

The study made it possible to comprehensively consider the transformation processes in the field of e-commerce and determine the role of artificial intelligence as a key factor in improving the efficiency of management strategies. It has been established that the digitalization of the economy is changing fundamental approaches to the formation of business models, positioning strategies and customer experience management, necessitating the integration of innovative technologies into all levels of enterprise functioning. Within the framework of the tasks set, the article systematizes the factors influencing the development of e-commerce and shows that the combination of macroeconomic conditions, changes in consumer preferences, regulatory reforms and local specifics forms a unique vector of market development. The proposed classification of e-commerce management strategies and the identification of their key elements made it possible to substantiate a system of business processes in which artificial intelligence acts as a catalyst for innovation. An analysis of the experience of leading companies (Amazon, Netflix, DHL, etc.) has shown that AI optimizes processes, personalizes the customer experience, and increases business competitiveness.

This confirms that effective e-commerce management in today's environment is impossible without the integration of intelligent technologies into the strategic and operational aspects of the business. The scientific novelty of the study lies in identifying the relationship between digital transformation, innovative management, and the application of artificial intelligence in e-commerce. The practical significance of the results lies in the possibility of their application to create adaptive e-commerce development strategies, taking into account global trends. A promising direction for further research is to evaluate the effectiveness of implementing intelligent systems in various segments of e-commerce, as well as to study the risks associated with their use in the context of sustainable development and digital security.

VI. AUTHOR'S CONTRIBUTION

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