SÉRIE “Ekonomika”

https://doi.org/10.52058/2695-1592-2024-6(37)-10-19

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AI TRENDS FOR E-COMMERCE

Abstract. This article is dedicated to analyzing trends in the implementation of artificial intelligence within the e-commerce sector and their impact on key business aspects. The objective of the research is to evaluate the role and influence of artificial intelligence in transforming and optimizing e-commerce. The scientific investigation employed methods of data analysis, process modeling, and forecasting. The findings indicate that artificial intelligence plays a pivotal role in e-commerce, significantly altering supply chain management, customer interaction, content creation, and personalized marketing. Data analysis revealed that e-commerce holds a substantial position in the modern economy, accounting for 21.5% of the retail market in 2023, with an anticipated growth to 25% by 2026. Its impact is amplified by the adoption of innovative technologies and shifts in consumer preferences. The volume of e-commerce reached $6.3 trillion in 2023, with a stable annual growth rate of 10%. Artificial intelligence, as a key innovation, is revolutionizing e-commerce by enhancing user experience and marketing efficiency, with the AI market expected to grow from $96 billion in 2021 to $1.85 trillion. The influence of AI on the global economy could reach $15.7 trillion by 2030, significantly surpassing contributions from countries like China and India. The research explored how the integration of artificial intelligence provides a deeper understanding of customer needs, facilitates process automation, and boosts the efficiency of business operations. The application of artificial intelligence in an omnichannel approach to customer interaction creates a seamless and integrated experience for consumers, enhancing their satisfaction and loyalty. Furthermore, advancements in dynamic pricing and delivery route optimization using artificial intelligence contribute to cost reduction and increased operational efficiency, making businesses more competitive and adaptable. Predictive analytics opens up possibilities for forecasting market trends and optimizing inventories, leading to maximized profitability and reduced waste. Given the above, artificial intelligence not only assists in adapting to changes
in the e-commerce sector but also actively shapes the industry's future, establishing new standards for customer interaction and productivity management. The practical significance of the research lies in providing strategic insights for businesses looking to integrate artificial intelligence into their processes and strategies to achieve growth and success in a highly competitive environment.

Keywords: artificial intelligence, e-commerce, business optimization, predictive analytics, omnichannel.

Introduction. In today's rapidly evolving world, the integration of technologies has become a key success factor in many industries, particularly in the e-commerce sector. Artificial Intelligence (AI) serves as one of the most powerful catalysts for these changes, offering opportunities to revolutionize business approaches by optimizing processes, enhancing customer engagement efficiency, and providing deeper analytical insights into market trends.

According to analytical reports, the share of e-commerce in the total retail market volume reached 21.5% in 2023 and is expected to continue growing, with projections reaching 25% by 2026 [3]. The development of AI in the e-commerce sector presents new opportunities for businesses, ranging from customer service automation through chatbots to the development of personalized marketing strategies based on predictive analytics. This technology not only enhances business competitiveness but also significantly improves user experience, laying the foundation for building strong and lasting customer relationships.

Given the enormous potential and rapid development pace of AI, it is essential to delve deeper into the analysis of specific trends and prospects it opens up for e-commerce, to fully assess the opportunities and challenges faced by modern enterprises in this field.

Analysis of the latest research and publications. The issue of utilizing artificial intelligence in e-commerce is not sufficiently addressed in the scholarly literature, presenting researchers with the task of gathering and analyzing information from alternative sources. Despite the scarcity of academic resources, some authors have made significant contributions to the development of the topic. Notably, researchers such as Bawack, R., Fosso Wamba, S., Carillo, K. D. A., and Akter, S. [1], who conducted a bibliometric study and literature review on the application of AI in e-commerce. Their work, "Artificial Intelligence in E-Commerce: A bibliometric study and literature review" in Electronic Markets, is one of the few that sheds light on current directions in this area.

Additionally, significant contributions were made by Raji, M., Olodo, H., Oke, T., Addy, W., Ofodile, O., and Oyewole, A. [6], who in their review "E-commerce and consumer behavior: A review of AI-powered personalization and market trends" in GSC Advanced Research and Reviews, explored the impact of AI on consumer behavior and personalization in e-commerce.

Given the limited academic works, research also relies on statistical data and expert literature. Significant sources of statistical information include reports from
Statista (2024), "Total retail sales worldwide from 2021 to 2026", providing an overview of total retail sales and their relationship with e-commerce.

Expert materials, such as analyses from Mobiloud [2], "Ecommerce Platform Market Share Trends in the USA", and ecommerce db [3], "Artificial Intelligence (AI) Trends in eCommerce 2024: Images, Pricing & Chatbots", allow for an understanding of current AI usage trends in e-commerce, including the implementation of chatbots, dynamic pricing, and image optimization.

These contributions are crucial for understanding the current state and future prospects of AI use in e-commerce. However, it is important to acknowledge that a comprehensive understanding of the topic requires gathering and systematizing a broader spectrum of information, including both scientific research and expert assessments.

**Purpose of the article.** The aim of this research is to evaluate the role and impact of artificial intelligence on the transformation and optimization of e-commerce. To achieve this goal, the following tasks were undertaken: analysis of e-commerce growth trends, examination of the impact of artificial intelligence on marketing strategies and consumer experience, forecasting future AI market developments, analyzing the impact of AI on the global economy, assessing GDP growth prospects through the use of artificial intelligence, exploring key trends in AI utilization in e-commerce, and conducting a thorough analysis of AI-related marketing trends.

**Results.** In recent years, e-commerce, which encompasses the buying and selling of goods and services via electronic systems, particularly the Internet, has demonstrated a significant impact on modern trade processes. According to analytical estimates, in 2023, the share of e-commerce in the total retail market reached approximately 21.5% and continues to grow annually by 1% [10]. It is projected that by 2026, this share will reach 25% of the total retail market. This growth trend is a result of the integration of new technologies into all aspects of life, including retail.

![Fig. 1. Comparison of the Global E-commerce Market and Global Trade, in Trillions USD](image)

Note: Organized by the author based on data from [5;10]
In absolute numbers, the volume of e-commerce in 2023 reached approximately $6.3 trillion USD, indicating stable annual sector growth of 10%. It is expected that the use of modern marketing strategies and consideration of consumer expectations can contribute to further revenue growth from e-commerce at a rate of more than 10% annually [5].

These data highlight the significant role of e-commerce in the contemporary economy and its potential for further expansion through adapting to innovative technologies and shifts in consumer preferences. Artificial intelligence, being among the most progressive innovations, is increasingly infiltrating all aspects of human activity. Within the context of e-commerce, it assumes a pivotal role in the transformation of both consumer experiences and marketing strategies [2]. The AI market is anticipated to grow from $96 billion in 2021 to $1.85 trillion, underscoring the profound influence of AI on enhancing customer experiences and marketing efficacy [3] (Fig.2).

The impact of AI on the global economy could reach $15.7 trillion by 2030, thanks to increased productivity and consumption. This impact significantly surpasses the combined contributions of countries such as China and India, highlighting the depth and breadth of AI's potential influence. Analyst forecasts suggest that by 2030, China could boost its GDP by 26.10% through the use of artificial intelligence. The USA, in turn, has the potential to see a GDP increase of up to 14.5% [3] (Fig.3).
In the context of e-commerce, key trends driven by AI include personalized marketing, the significance of the last touchpoint in the purchasing decision process, retail network advertising, and a focus on data management and privacy [9]. Applications that currently employ AI have greater market potential compared to those that do not utilize artificial intelligence. It is projected that by 2028, applications incorporating AI could capture a market share worth $38.5 billion USD [3] (Fig.4).

To more thoroughly investigate the significance of Artificial Intelligence (AI) in the development of e-commerce, a detailed analysis of marketing trends was conducted [4;7]. Key aspects include interactivity, creative content, personalized marketing, omnichannel retail, supply chain enhancements, analytics, and agility. Let's examine each in more detail.
Interactivity in e-commerce implies creating a more engaging and personally meaningful experience for consumers through instant interaction and personalization. The application of AI in this context introduces innovations in customer interaction methods. For example, AI algorithms can analyze individual preferences, browsing history, selected filters, demographic data, and even real-time behavior data to create a hyper-personalized experience. Platforms like Amazon and eBay already use AI to analyze user data, making product recommendations much more accurately aligned with user preferences [3].

Visual search is also an important aspect, significantly simplifying online shopping, making it more convenient, accessible, and efficient. Visual search allows for finding products without the need to describe them in words, reducing the path from search to conversion and enhancing the search experience. Retailers looking to leverage this AI technology need to integrate their business into visual search engines like Google Lens, Bing Visual Search, and Pinterest Lens [3].

In terms of interactivity and individual interaction, artificial intelligence (AI) is revolutionizing the ways consumers interact with brands. Virtual assistants such as Siri, Alexa, and Google Assistant have integrated voice search into our daily lives, allowing users to search for products and even complete purchases using voice commands. These intelligent systems can process and address customer inquiries in real time, contributing to improved customer service efficiency and reduced response time. The technology isn't new, but its effectiveness has significantly improved recently [4].

Chatbots also have a significant impact on e-commerce, handling customer inquiries, providing product recommendations, and assisting with order tracking and returns. In most cases, they resolve standard inquiries quickly and efficiently and are available 24/7. Both technologies are particularly beneficial on mobile devices, where convenience and speed of interaction are key factors in user satisfaction [4].

The integration of AI into interactivity and interaction enhances the quality of communication between consumers and brands, making this process more natural and efficient. Such innovations not only optimize the user experience but also open up new opportunities for increasing customer loyalty and satisfaction, ultimately contributing to business growth [7].

Creative Content: another key trend in the development of e-commerce is the creation of modern creative content. In the digital era, brand storytelling is increasingly conveyed through multimedia means. High-quality video content, professional-grade photographs, engaging textual narratives, and thoughtfully designed layouts are fundamental components of an effective digital narrative that attracts user attention and translates it into tangible revenue [3].

Artificial Intelligence (AI) plays a crucial role in media and content creation, encompassing the generation of product images, videos, descriptions, or any other type of content. With AI, high-quality and appealing product descriptions can be
created in seconds. This not only simplifies the process but also enhances its efficiency. Mockups (product design prototypes) are not new, but recent advancements in AI technology offer businesses virtually unlimited possibilities for product visual presentation. Although content generation with AI requires an investment of time and effort to master various tools, the outcome justifies itself in the long term [7].

Personalized Marketing: the next significant trend in the development of e-commerce is personalized marketing, greatly amplified by the capabilities of Artificial Intelligence (AI). AI provides businesses with the ability to create targeted marketing campaigns, tailored messages, and individualized offers, significantly improving the consumer experience and ensuring a high level of customer satisfaction [4].

The application of AI in personalized marketing can include sending emails with recommendations based on previous purchases, applied filters, or user behavior during product browsing. AI can also adapt advertising and promotional materials displayed on websites or in social networks, ensuring high relevance and effectiveness of marketing efforts.

Personalized marketing not only enhances customer satisfaction but also provides businesses with a higher return on investment and improved customer retention. Studies show that 91% of consumers prefer to shop with brands that offer personalized offers and recommendations [6].

Furthermore, AI is transforming inventory management, supply chain optimization, and delivery processes in e-commerce. AI algorithms are capable of analyzing historical data, demand patterns, and market trends to create accurate sales forecasts. This allows for the optimization of inventory levels and the minimization of excess inventory and associated costs.

The efficiency of the supply chain can also be enhanced through AI by automating various tasks such as order tracking, warehouse management, and logistics of delivery. Thus, personalized marketing using AI not only improves the consumer experience but also streamlines internal operational processes of businesses in e-commerce.

Omnichannel Retail: artificial Intelligence (AI) is crucial for the development of omnichannel retail, a strategy that provides a seamless and integrated consumer experience across various sales and interaction channels - from physical stores to online platforms. The use of AI in omnichannel retail opens up new opportunities for improving customer interaction, optimizing operational processes, and enhancing overall efficiency. AI enables the analysis of large volumes of consumer behavior data across different channels, identifying individual preferences and habits. This information is used to create personalized recommendations and offers that can be presented to customers at the right time through the most appropriate channel [4].
Supply Chain Optimization: artificial Intelligence (AI) plays a pivotal role in the optimization of supply chains, especially in the context of "last-mile" delivery, which is the most cost-intensive stage of transporting goods. This stage involves the transfer of packages from distribution centers to customers' doorsteps. For retailers, this means dozens, and sometimes thousands, of delivery locations daily, making the determination of optimal routes key to the efficiency of delivery operations.

AI-based route optimization software has become an integral part of this process, offering predictions for the best routes for each delivery vehicle. It considers the number of deliveries per day, delivery time frames, sequence, and other factors, significantly enhancing delivery efficiency. The application of advanced AI algorithms allows for the analysis of key parameters and the selection of the best delivery routes, leading to reduced fuel consumption and improved delivery times.

Optimizing delivery routes not only helps reduce delivery costs but also improves the overall consumer experience through faster and more efficient service. Consequently, the application of AI in supply chains not only optimizes internal processes but also creates a positive impact on customer satisfaction, which is critically important in the competitive retail environment [7].

Analytics and Agility: analytics and agility are fundamental aspects of modern marketing planning, especially in the dynamic landscape of e-commerce development. In 2024, successful brands will view analytical insights as forecasts of the future and practical steps for building their marketing strategies. This approach involves the integration of various tactics to form a comprehensive and effective marketing plan that actively adapts to market trends and consumer demands.

Pricing is crucial but often challenging, as the optimal price depends on many factors, including production costs, competitors' prices, customer acquisition costs, and supply and demand. These factors are subject to fluctuations, making pricing particularly complex. AI-based tools enable e-commerce businesses to effectively detect these fluctuations by analyzing vast amounts of data to optimize pricing strategies for maximizing profitability. This practice, known as "dynamic pricing," allows businesses to quickly adjust prices with minimal effort, maintaining competitiveness in a dynamic market, increasing sales, and maximizing revenue [8].

Predictive analytics, bolstered by AI, enables e-commerce businesses to anticipate customer needs and preferences, making accurate forecasts about future trends, consumer behavior, and market demands. This gives businesses the opportunity to make informed decisions regarding product development, inventory management, and marketing strategies. For example, an online clothing retailer might use predictive analytics to forecast inventory needs, determining which styles, colors, or sizes will be in demand in the upcoming season. This proactive approach provides businesses with a competitive edge, reduces waste, and improves overall customer satisfaction.
In summary, AI has the potential to elevate e-commerce to a new level. The research is summarized in Table 1.

**Table 1**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>The value of AI</th>
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<tbody>
<tr>
<td>Interactivity</td>
<td>Using algorithms to analyze individual preferences and create a personalized experience; visual search to simplify online shopping.</td>
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<tr>
<td>Creative content</td>
<td>Automating the creation of high-quality content, including product images and descriptions, using AI.</td>
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<tr>
<td>Personalized marketing</td>
<td>Targeted campaigns and adaptation of marketing messages based on user behavior and preferences.</td>
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<tr>
<td>Omnichannel retail</td>
<td>Analyze large amounts of data on consumer behavior across channels to create an integrated consumer experience.</td>
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<tr>
<td>Supply chain optimization</td>
<td>Optimize delivery routes and inventory management by forecasting demand and analyzing market trends.</td>
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<tr>
<td>Analytics and flexibility</td>
<td>Use predictive analytics to anticipate customer needs and optimize pricing strategies.</td>
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Note: organized by the author

**Conclusions.** Considering the analysis of the trends in the implementation of Artificial Intelligence (AI) in the realm of e-commerce, it can be concluded that AI plays a critical role in transforming and optimizing key aspects of business. The integration of AI into customer interactions, content creation, personalized marketing, supply chain management, as well as analytics and agility in decision-making, opens new horizons for expanding the capabilities of e-commerce.

AI not only facilitates the automation and efficiency enhancement of processes but also provides businesses with tools for a deeper understanding and anticipation of customer needs, ultimately leading to increased customer satisfaction and loyalty. The omnichannel approach, enhanced by AI’s analytical capabilities, ensures a seamless and integrated experience for consumers, regardless of the interaction channel.

Advancements in dynamic pricing and optimization of delivery routes using AI not only reduce costs and increase operational efficiency but also contribute to creating a more competitive and adaptable business. Predictive analytics paves the way for forecasting market trends, consumer behavior, and inventory optimization, which in turn aids in maximizing profitability and reducing waste.

Given these trends, it can be stated that AI not only assists in adapting to changes in the e-commerce sector but also actively shapes the future of the industry, setting new standards in customer interaction, performance management, and innovation. Brands that effectively integrate AI into their strategies have every chance not only to survive in a highly competitive environment but also to achieve significant growth and success.
References:


