REVIEW OF RESEARCH
ISSN: 2249-894X
IMPACT FACTOR : 5.7631(UIF)
VOLUME - 15 | ISSUE - 8 | MAY - 2026

CLICK, SHOP, REPEAT: HOW AI SHAPES TODAY'S E COMMERCE

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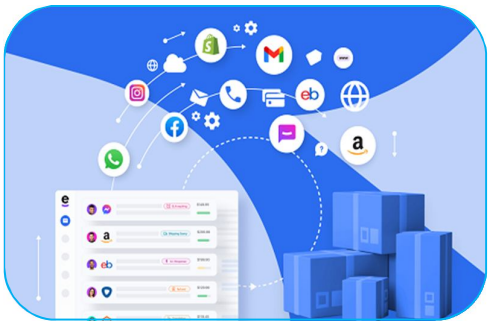
ABSTRACT



The fast growing and dynamic e-commerce & digital marketplace have been gradually turning from transactional-centric to intelligences driven e-commerce & digital marketplace based on Artificial Intelligence (AI). This study discusses the impactful contributions made by AI to e-commerce and the ability of AI to enhancing the customer experience (CX), improving the decision-making efficiency & security levels. Using literature review methodology and text mining methodology, to analyse the current trends, this paper identified the critical enablers as Machine Learning (ML), Augmented Reality (AR), Big Data Analytics (BDA), etc. Data also demonstrate that through AI, both the customer satisfaction and customer engagement are enhanced with 'smart' and sentiment-aware chatbot & AR shopping assistant with capabilities such as a 'hyper-personalized' service and intelligent and accurate inventory management & price management are enabled through combining BDA and AI. The study is also exploring critical issues such as data privacy, recommendation system's cold-start issue, integration difficulties between AI & legacy system. But the study revealed that businesses could not afford to ignore difficult issues concerning data ethic issues and scalability problem even through 'hyper-personalized' e-commerce service has turned out to be the competitive advantage. Conclusively, the future of e-commerce would depend on integration of AI, Cloud Computing and Blockchain technology, to create an ultra-efficient and trustful trade environment all over the world.

KEYWORDS: *Artificial Intelligence, E-commerce, Machine Learning, Customer Experience, Big Data Analytics, Augmented Reality, Personalization, etc.*

INTRODUCTION:

What began as a rigid digital catalogue has matured into an intelligent ecosystem, the journey of a consumer from one product to another thoughtfully constructed by sophisticated algorithms. Today's e-commerce environment is characterized by the motto 'Click, Shop, Repeat' and the invisible hand of Artificial Intelligence. Through the use of Machine Learning, Big Data Analytics, and Augmented Reality the consumer's online buying experience-ranging from discovery of products to purchase and delivery-has become intricately curated by AI.

This advancement allows retailers to shift from a transactional and uniform approach towards the 'hyper-personalization' of services and goods. Through the consumption of Big Data-including but not limited to customer click streams and social media attitudes-vendors can anticipate consumer demands and wants even prior to their conscious manifestation, and by doing so stimulate repetitive consumption behaviors. Nevertheless, the evolution in technology goes far beyond simple e-commerce

ease-of-use and constitutes a disruption and re-creation of the entire e-commerce value chain, based on the core tenets of data-driven strategy and automatic decisions as competitive advantage. This study seeks to delineate how AI is influencing today's retail practices, how it will be applied to increase both customer satisfaction and efficiency and finally address the many ethical implications associated with data-centric economies.

AI is increasingly the driving force of online strategy as all over the world organizations wish to improve their online image. Integrating AI in e-commerce isn't a one-time event; it's an integrated transformation that has already occurred in part by offering new development tools, technical bases, and ease of integration. For the consumer AI presents itself in the form of product suggestions or a virtual assistant. "Electronic commerce, too, is currently in the process of a fundamental transformation. Competition is no longer solely determined by a diverse product offering but more and more by sophisticated technology in the applications that support the e-commerce business processes." (Sulova, 2023)

For the vendor, it "acts as a strong force of Big Data Analytics (BDA) which facilitates faster and precise strategy making on the market and inventory" (Oktaviani et al., 2024). This research paper examines the way these AI powered solutions are redefining business processes in e-commerce, what drives them and what are the challenges ahead.

Research methodology:

The study takes a qualitative and descriptive approach relying on the comprehensive literature review of the most recent publications from the most reputable scientific journal, industry report covering the timeframe from 2011-2025. The methodological approach is similar to the "text mining analysis" (Ho et al., 2023, pp. 239-259) and "deep scientific analysis" (Sulova, 2023) applied by many e-commerce researchers for identification of main themes and technology trends. The approach of this research is to consolidate these disparate findings from multiple disciplines, i.e. Computer science, business management and economics to determine "The impact of AI paradigms supervised, unsupervised, and reinforcement learning" (Dritsas & Trigka, 2025, pp. 99048-99067) on the value chain in e-commerce. The methodological approach classifies the AI applications into three broad domains: customer-facing applications, back-office operational enhancements and security and infrastructure maintenance.

Analysis and Discussion:

Increasing the Customer Experience (CX) using Personalization:

Perhaps the greatest contribution that AI has made to e-commerce is its use in unlocking the hyper-personalized customer experience. "AI can enable personalized interactions in the CRM system and deliver a user interface that brand users can interact with almost as naturally as possible." (Tran, 2024).

AI-powered chatbots:

"Current e-commerce applications use AI to improve chatbot use by applying the analysis of the tone and intent of a given response rather than giving programmed answers to improve question and answering system performance" (El-Ansari & Beni-Hssane, 2023, pp.1-22).

AR assistants:

Augmented Reality Shopping Assistance Applications (ARSAPs) are innovative tools for mobile commerce. "ARSAPs enable customers to virtually try out a product before the purchase of an item in a simulated environment" (Ho et al., 2023, pp. 239-259). "Consumers particularly Gen Z increasingly turn to the AR virtual experience and try on the products before purchasing online, which gives them a sense of reality for the experience" (Kovacs & Keresztes, 2024, p. 56). "Key factors determining customer satisfaction with the AR tools include the visuals and the sense of reality, as well as user-friendliness" (Ho et al., 2023, pp. 239-259).

Paradigms of ML and operational effectiveness:

Machine Learning methods implemented in functional fields have caused to transform e-Commerce operations. ML has been applied in various domains:

Product Recommendations:

"In order to present targeted and appropriate products for each customer, supervised and unsupervised learning can be utilized" (Dritsas & Trigka, 2025, pp. 99048-99067).

Price adjustments and fraudulent identification:

"Machine Learning can also set dynamically pricing adjusted for demand and identifying fraudulent online payments" (Dritsas & Trigka, 2025, pp. 99048-99067).

Big Data Analytics (BDA):

"E-vendors are taking advantage of Big Data Analytics to remain competitive, processing all the big amounts of data from social network and transactional logs in order to understand the flow of the market" (Alrumiah & Hadwan, 2021, pp. 37281-37286). "The Machine Learning driven BDA makes sure that there will be enough patterns to provide more precise forecasting and efficient stock and marketing planning" (Oktaviani et al., 2024).

Infrastructure, Security and Trust:

Along with increased e-Commerce functionality, comes the infrastructure needed.

Hybrid Cloud Approaches:

In order to handle all the amount of data needed for AI, it's going to use hybrid cloud. "This strategy improves performance, scalability and cost while it allows for greater security of data" (Gorantla et al., 2024, pp. 494-499).

Integration of Blockchain:

"Although ML handles the analysis part, blockchain technology is tested to assist in problems with privacy, security and trust" (Karani & Mwapwele, 2023), with "the potential of providing transparent and irrefutable ledger data for supporting decisions though not without barriers" (Al-Moghrabi & Al-Ghonmein, 2024).

Mobile Payments:

"The further evolution of e-Commerce could involve changes within the mobile payment solutions with the aim of making it safer and using contactless transactions and digitally encrypted wallets" (Bezhovski, 2016, pp. 127-132).

Challenges and Barriers to Adoption:

Nevertheless, the advantages however, moving towards an AI driven e-commerce model is not a smooth ride.

Data and Privacy:

"Customer privacy and trust continue to remain the most important factor for customers and organizations alike." (Wulan, 2024) In this aspect, "the increased rate of data growth has presented challenges with analyzing and managing the data and compliance with various privacy regulations" (Alrumiah & Hadwan, 2021, pp. 37281-37286).

Technicalities:

'Cold start' issue (lack of adequate information for recommendations when a new customer arrives), data sparsity, "explainability for AI models, among others are major hurdles in adopting the AI driven models" (Dritsas & Trigka, 2025, pp. 99048-99067).

Implementation Costs:

High investment, implementation complexity and associated costs may make adoption of enterprise-level platforms such as "SAP Hybris for management of omnichannel commerce difficult to implement globally, even though there could be huge long-term advantages." (Sagar et al., 2023).

Disparity:

Emerging countries such as South Africa or Zimbabwe have encountered data quality issues, "immature local ICT infrastructure and the inability to handle Big Data efficiently but still possess high intent by decision makers to scale up if only technological capacity improves." (Cloete & Doens, 2008, pp. 184-196; Takundwa et al., 2025).

Key Findings of the Study:

Drivers of Satisfaction:

"AI fueled e-commerce customers are satisfied with the visual and realism of the AR tools used and responsive of smart personal chatbots and relevance of recommendations from ML system." (El-Ansari and Beni-Hssane, 2023, 1–22, Ho et al., 2023, 239–259).

Strategic Advantage:

Big Data Analytics powered by "AI is becoming indispensable, a necessity for vendors in order to boost their revenues, attract new consumers and speed up strategic decision making." (Alrumiah & Hadwan, 2021, pp. 37281-37286; Oktaviani et al., 2024).

Security Synergy:

The highest level of resilience is in e-commerce applications, where "AI is used for analysis, hybrid cloud is used for storing the data and block chain for storing the transaction for transparency." (Al-Moghrabi & Al-Ghonmein, 2024; Gorantla et al., 2024, pp. 494-499).

Sustainability and Ethics:

"Green supply chains" (Lin et al., 2023) in cross border e-commerce is increasingly common practice with AI applied to improve logistics, though best practices have not yet been established.

Dispute Resolution:

The technology is also invading the legal aspect of e-commerce in the form of Online Dispute Resolution (ODR) models which make use of AI peacekeepers to settle "cost-effective and easy-to-use conflict resolution" (Wahid, 2023).

CONCLUSION:

Thus, to sum up, this has also raised AI from futuristic concept to underlying factor enabling the entire e-commerce sector. From an enriched visual dimension through AR, personalized experience of customer through sentiment aware AI, and an improved operational perspective through Big data for backend processes, there exists a holistic model to a technological development with AI. While fully optimizing the application of AI relies on solving persistent problems such as privacy of data, scalability of the system, and disparity in the adoption of ICT globally, a country/business that can adeptly manage and integrate these technologies is destined to survive the 5.0 revolution ahead of the sector. Future research could explore a clearer and step by step implementation and integration process of new paradigms such as quantum ML and neuromyotonic AI in an attempt to maximize efficiency and rectitude of the e-commerce processes.

To sum up, the "Click, Shop, repeat" is the characteristic of an advanced AI driven economy which thrives on effortless experiences and prediction efficiency. Through innovations such as, chatbots that perceive consumers' sentiments, AR to visualize products and predictive price, it has already fulfilled the void between customer needs and the product that consumers seek. Moreover, these innovations have set a new precedent for customer experiences and empowered vendors with analysis tools for fluctuating global economies. The future of AI in e-commerce is not all rosy; the sector faces challenges in bridging the gap between hyper-personalization and the urgent need of data privacy and ethical transparency. The businesses that will continue to bloom in this new digitally driven economy which potentially amalgamates with Blockchain and Hybrid Cloud architectures will be those who balance efficiency and trust. AI is no longer an addition but a necessity that drives the global e-commerce narrative toward the next evolutionary phase

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