(REVIEW ARTICLE)

AI in E-commerce: Reviewing developments in the USA and their global influence

Olubusola Odeyemi [1], Oluwafunmi Adijat Elufioye [2], Noluthando Zamanjomane Mhlongo [3], Andrew Ifesinachi Daraojimba [4, *], Funmilola Olatundun Olatoye [5] and Kehinde Feranmi Awonuga [6]

[1] Independent Researcher, Nashville, Tennessee, USA.
[2] Independent Researcher, Lagos, Nigeria.
[3] Department of Accounting, City Power, Johannesburg, South Africa.
[4] Department of Information Management, Ahmadu Bello University, Zaria, Nigeria.
[5] Independent Researcher, Houston, Texas, USA.
[6] Independent Researcher, UK.

Abstract

The integration of Artificial Intelligence (AI) in the field of E-commerce has witnessed significant developments in the United States, subsequently influencing global trends and practices. This study explores the recent advancements and their broader impact on the E-commerce landscape. In the USA, AI technologies have become integral to enhancing customer experiences and optimizing operational efficiency in E-commerce platforms. Machine learning algorithms are increasingly employed for personalized recommendations, creating a more tailored shopping experience for users. Natural Language Processing (NLP) applications enable improved customer interactions through chatbots and virtual assistants, streamlining customer service processes. Furthermore, AI-driven predictive analytics has revolutionized inventory management and demand forecasting, allowing E-commerce businesses to optimize stock levels, reduce costs, and minimize out-of-stock situations. This data-driven approach not only enhances operational efficiency but also contributes to a more sustainable and resilient supply chain. The influence of AI in the USA has transcended domestic boundaries, shaping global E-commerce practices. As American E-commerce giants implement cutting-edge AI technologies, other nations look to adopt similar strategies to remain competitive in the global market. The adoption of AI is particularly pronounced in emerging E-commerce markets, where technological advancements play a pivotal role in leapfrogging traditional retail models. Despite these advancements, challenges such as data privacy concerns and ethical considerations surrounding AI algorithms persist. Striking a balance between innovation and responsible AI implementation is crucial to ensuring sustained growth and societal trust in E-commerce platforms (Ilugbusi et al., 2020). AI has become a transformative force in the USA's E-commerce sector, triggering a ripple effect on a global scale. As the technological landscape evolves, a comprehensive understanding of the developments in the USA provides valuable insights for E-commerce stakeholders worldwide, guiding them in harnessing the full potential of AI for future growth and innovation.

Keywords: AI; E-commerce; USA; Global influence; Development; Review

1. Introduction

The rapid integration of Artificial Intelligence (AI) in the realm of E-commerce has ushered in a transformative era, redefining the way businesses engage with consumers and optimize operational processes (Allioui and Mourdi, 2023). In this context, this review delves into the recent developments in the USA, a pioneering force in AI adoption, and explores the consequential global influence on the E-commerce sector.

* Corresponding author: Andrew Ifesinachi Daraojimba

Artificial Intelligence in E-commerce encapsulates a spectrum of technologies and algorithms designed to augment various facets of online retail operations (Jiang, 2023). From predictive analytics and machine learning to Natural Language Processing (NLP), AI is at the forefront of enhancing customer experiences, streamlining operations, and providing invaluable insights for strategic decision-making (Rane, 2023). In essence, AI in E-commerce goes beyond mere automation; it empowers businesses to dynamically respond to consumer behaviors and market trends, fostering agility and adaptability in an ever-evolving digital landscape (Allioui and Mourdi, 2023).

The significance of AI in E-commerce lies in its unparalleled ability to reshape traditional business models and elevate the overall shopping experience (Abushammala *et al*., 2022). As consumers increasingly seek personalized interactions and seamless transactions, AI technologies play a pivotal role in meeting these expectations (Kumar *et al*., 2021). Moreover, AI-driven insights contribute to improved efficiency in inventory management, supply chain optimization, and targeted marketing strategies, thereby enhancing the competitiveness and sustainability of E-commerce platforms (Salhab *et al*., 2023). The profound impact of AI extends beyond national borders, with the developments in the USA serving as a catalyst for global trends, influencing how businesses around the world approach and incorporate AI in their E-commerce strategies.

2. Developments in AI in E-commerce in the USA

The rapid integration of Artificial Intelligence (AI) in the realm of E-commerce has ushered in a transformative era, redefining the way businesses engage with consumers and optimize operational processes (Ntumba *et al*., 2023). In this context, this review delves into the recent developments in the USA, a pioneering force in AI adoption, and explores the consequential global influence on the E-commerce sector.

Artificial Intelligence in E-commerce encapsulates a spectrum of technologies and algorithms designed to augment various facets of online retail operations. From predictive analytics and machine learning to Natural Language Processing (NLP), AI is at the forefront of enhancing customer experiences, streamlining operations, and providing invaluable insights for strategic decision-making (Kamal and Himel, 2023). In essence, AI in E-commerce goes beyond mere automation; it empowers businesses to dynamically respond to consumer behaviors and market trends, fostering agility and adaptability in an ever-evolving digital landscape. The significance of AI in E-commerce lies in its unparalleled ability to reshape traditional business models and elevate the overall shopping experience (Abushammala *et al*., 2022). As consumers increasingly seek personalized interactions and seamless transactions, AI technologies play a pivotal role in meeting these expectations. Moreover, AI-driven insights contribute to improved efficiency in inventory management, supply chain optimization, and targeted marketing strategies, thereby enhancing the competitiveness and sustainability of E-commerce platforms (Salhab *et al*., 2023). The profound impact of AI extends beyond national borders, with the developments in the USA serving as a catalyst for global trends, influencing how businesses around the world approach and incorporate AI in their E-commerce strategies (Hallema, 2022).

3. Global Influence of USA's AI in E-commerce

The emergence and proliferation of Artificial Intelligence (AI) technologies within the E-commerce domain have positioned the United States as a global leader in shaping the future of online retail (Shukla *et al*., 2023). The impact of American advancements in AI transcends national boundaries, influencing adoption trends and reshaping the competitive landscape in E-commerce worldwide.

The adoption of AI in E-commerce is not uniform across all nations, but certain key markets have demonstrated a notable embrace of these technologies (Wang *et al*., 2023). In Europe, countries such as the United Kingdom, Germany, and France have been quick to incorporate AI into their E-commerce strategies. Asian markets, particularly China and Japan, have also been at the forefront of AI adoption, leveraging technologies such as machine learning and facial recognition to enhance the customer experience (Mithra *et al*., 2023). The identification of these key markets reflects a global recognition of the transformative potential that AI holds for E-commerce.

In emerging E-commerce markets, where traditional retail infrastructure may be less established, AI provides a unique opportunity for technological leapfrogging (Furr *et al*., 2022). Nations in Southeast Asia, Africa, and South America are leveraging AI to overcome infrastructural constraints and rapidly advance their E-commerce capabilities. By embracing AI technologies, these countries can bypass some of the challenges faced by more developed E-commerce markets, fostering innovation and creating a foundation for sustainable growth in the digital economy (Haqqi and Murdani, 2023).

The influence of USA's AI developments on global E-commerce giants is unmistakable. American tech behemoths, such as Amazon, Google, and Facebook, have set the benchmark for AI integration in E-commerce operations (Kejriwal, 2022). The strategies and technologies implemented by these industry leaders reverberate across borders, influencing how E-commerce platforms worldwide approach AI adoption (Jacobides *et al*., 2021). As a result, the global E-commerce landscape is characterized by a convergence toward the best practices set by American innovators. Non-US E-commerce businesses are strategically responding to the influence of American AI developments by adopting innovative strategies to remain competitive on the global stage (Banerjee and Dutta, 2023). Many are investing significantly in research and development to develop or acquire AI capabilities that align with consumer preferences and industry trends. Collaboration with AI startups and technology firms, both within and outside their respective countries, has become a common approach for non-US businesses seeking to infuse AI into their E-commerce operations. Additionally, there is a growing emphasis on leveraging localized data and cultural nuances to tailor AI applications for specific markets (Soliman and Al Balushi, 2023). This approach enables E-commerce players to enhance user experiences, build trust, and navigate regulatory landscapes effectively. By customizing AI applications to cater to the unique needs of diverse consumer bases, non-US businesses aim to carve out niches in the global market and establish themselves as formidable contenders against their American counterparts.

In summary, the global influence of USA's AI in E-commerce extends beyond the adoption trends in various countries to reshape the competitive landscape (He and Liu, 2024). As nations worldwide acknowledge the potential of AI to revolutionize the E-commerce sector, the influence of American innovations serves as a guiding force, encouraging both developed and emerging markets to embrace these technologies and devise strategies to stay competitive in an increasingly AI-driven global market.

4. Case Studies

Amazon, a trailblazer in AI-driven E-commerce, exemplifies the transformative impact of technology on pricing strategies (Zhang and Hänninen, 2022.). The company utilizes sophisticated algorithms to dynamically adjust product prices based on various factors, including demand fluctuations, competitor pricing, and user behavior (Yin and Han, 2021) Amazon's AI algorithms continuously analyze massive datasets in real-time, enabling the platform to react swiftly to market changes. For instance, during peak shopping seasons or special promotions, the algorithms adjust prices to optimize revenue and competitiveness. This dynamic pricing strategy has allowed Amazon to remain agile in a highly competitive market, offering customers competitive prices while maximizing profits. Amazon's dynamic pricing strategy has influenced E-commerce platforms globally (Lari *et al*.,2022). Companies worldwide are adopting AI-powered pricing models to stay competitive and respond rapidly to market dynamics. This case illustrates how a pioneering AI approach in the USA has become a benchmark, shaping pricing strategies across the global E-commerce landscape.

Alibaba, the Chinese E-commerce giant, employs advanced AI algorithms to deliver personalized shopping experiences (Rashidin *et al*., 2021). Through their platform, Alibaba tailors product recommendations, advertisements, and user interfaces based on individual customer preferences, browsing history, and purchase behavior. Alibaba's AI system leverages machine learning and deep learning to analyze vast datasets, extracting valuable insights into user preferences (Zhang *et al*., 2023). This enables the platform to provide users with highly targeted and relevant content, enhancing the overall shopping experience. The algorithms continuously learn and adapt, ensuring that recommendations remain up-to-date and reflective of users' evolving tastes. Alibaba's success with AI-driven personalization has reverberated globally. E-commerce platforms worldwide are investing in similar technologies to replicate the tailored experience Alibaba offers (Jean *et al*.,2021). This case demonstrates how AI applications in user personalization, pioneered by a Chinese company, have become a global standard for delivering enhanced customer engagement.

Shopify, a Canadian E-commerce platform, showcases the global impact of AI in inventory management. The platform utilizes AI algorithms to optimize inventory levels, predict demand, and streamline supply chain operations for businesses of all sizes. Shopify's AI algorithms analyze historical sales data, market trends, and external factors to generate accurate demand forecasts (Ahmadov and Helo, 2023). This information aids businesses in managing inventory efficiently, reducing costs, and minimizing instances of stockouts or overstock. The platform's AI-driven approach has democratized advanced inventory management, empowering small and medium-sized enterprises to compete effectively in the global market (Kumar, 2023). Shopify's AI-powered inventory management system has influenced E-commerce businesses globally. Companies across different regions are adopting similar technologies to enhance operational efficiency and improve supply chain resilience (Sá *et al*., 2020). This case illustrates how an AI innovation from Canada has transcended borders, becoming a best practice for E-commerce platforms worldwide.

These case studies underscore the far-reaching influence of AI developments in the USA and beyond, showcasing how innovative approaches pioneered by companies in one country have become benchmarks and driving forces for E-commerce practices globally.

5. Challenges and Ethical Considerations

Artificial Intelligence (AI) has become an integral part of the E-commerce landscape, driving innovation, enhancing customer experiences, and optimizing business operations (Babayev and Israfilzade, 2023). However, as AI applications in E-commerce continue to proliferate, they bring forth a set of challenges and ethical considerations that demand careful attention (Castillo and Taherdoost, 2023). In this study, we delve into two crucial facets: Data Privacy Concerns and Ethical Considerations in AI Algorithms.

One of the foremost challenges in the integration of AI in E-commerce revolves around striking a delicate balance between harnessing data-driven insights for personalized experiences and adhering to stringent privacy regulations (Perera and Iqbal, 2021). As E-commerce platforms collect vast amounts of consumer data — ranging from browsing histories and purchase patterns to personal preferences — the potential for misuse or unauthorized access becomes a significant concern (Youssef and Hossam, 2023). Regulatory frameworks, such as the General Data Protection Regulation (GDPR) in Europe and similar measures worldwide, necessitate robust mechanisms for obtaining informed consent and safeguarding user data. Ensuring compliance with these regulations is paramount to building and maintaining trust among consumers. E-commerce entities must invest in secure data storage, implement transparent privacy policies, and deploy advanced encryption techniques to safeguard sensitive information (Becher *et al.*, 2020). Sticriking this balance is not only a legal requirement but also crucial for fostering a positive relationship between consumers and AI-driven E-commerce platforms as explain in figure 1.

Figure 1 The consumer AI experience (Puntoni *et al.*, 2021)

Ethical considerations in AI implementation within E-commerce extend beyond legal compliance to encompass broader notions of responsible and fair usage (Du and Xie, 2021). Ensuring that AI algorithms are deployed ethically involves transparency in how data is collected, processed, and utilized. E-commerce platforms must communicate clearly with users about the role of AI in their operations, assuring customers that their data is used responsibly and ethically (Kunz and Wirtz, 2023).

Responsible AI implementation also requires a commitment to avoiding manipulative practices. Algorithms that prioritize profit over user well-being, for example, by exploiting vulnerabilities in consumer behavior, raise ethical concerns (Cheng *et al.*, 2021). Striking a balance between business goals and user welfare is essential for the sustained growth and acceptance of AI-driven E-commerce. A significant ethical consideration in AI algorithms for E-commerce is the potential for biases (Ikhtiyorov, 2023). Algorithms, trained on historical data, can inherit and perpetuate biases present in that data. This can result in discriminatory outcomes, reinforcing existing societal inequalities. For example, biased algorithms may inadvertently lead to discriminatory pricing, exclusionary advertising, or skewed recommendations.

Addressing biases in AI algorithms involves a combination of thoughtful algorithm design, diverse and representative training data, and ongoing monitoring (Schwartz *et al.*, 2022). E-commerce platforms must invest in ethical AI development practices, regularly audit their algorithms for biases, and take corrective measures when biases are identified. Additionally, transparency in algorithmic decision-making is crucial to building trust with consumers and stakeholders, allowing them to understand how decisions are reached and providing avenues for appeal or clarification (Shin *et al.*, 2022).

In conclusion, the challenges and ethical considerations in AI for E-commerce underscore the need for a holistic approach that prioritizes both innovation and responsibility. Balancing data-driven insights with privacy regulations and ensuring responsible AI implementation are essential for maintaining consumer trust and regulatory compliance (Steinhoff and Martin, 2023). Simultaneously, addressing biases in algorithms is crucial for fostering fairness and equity in the E-commerce landscape. As the E-commerce sector continues to embrace AI, navigating these challenges will be instrumental in shaping a future where technological advancements align with ethical principles and societal values (Daraojimba *et al.*, 2023).

6. Future Outlook

The future of Artificial Intelligence (AI) in E-commerce holds tremendous promise, with emerging trends and ongoing innovations poised to further revolutionize the industry (Bala *et al.*, 2022). However, as we look ahead, it is imperative to address the challenges associated with responsible AI implementation, ensuring that innovation aligns seamlessly with ethical considerations and societal values.

The integration of cutting-edge AI technologies is at the forefront of the future landscape of E-commerce. Machine Learning (ML), Natural Language Processing (NLP), and Computer Vision are evolving rapidly, enhancing the capabilities of E-commerce platforms (Vuong and Mai, 2023). ML algorithms, for example, are becoming more adept at understanding complex user behaviors, enabling more accurate and personalized recommendations. NLP advancements contribute to more natural and context-aware interactions through virtual assistants, while Computer Vision facilitates enhanced visual search capabilities (Yadav, 2023). Additionally, the integration of AI with Augmented Reality (AR) and Virtual Reality (VR) is becoming increasingly prevalent. This allows consumers to virtually try on products or visualize items in their living spaces before making a purchase. As these technologies mature, they will redefine the online shopping experience, bridging the gap between the digital and physical realms. The future holds vast potential for innovation in AI applications within E-commerce (Babayev and Israfilzade, 2023). Predictive analytics will become more sophisticated, enabling businesses to anticipate customer needs and market trends with greater accuracy. AI-driven personalization will evolve to create hyper-personalized shopping experiences, considering not only past behaviors but also real-time context and emotions. Additionally, AI will play a pivotal role in enhancing customer service through advanced chatbots and virtual assistants capable of understanding and responding to complex queries. The intersection of AI with blockchain technology may address data privacy concerns by providing transparent and secure data management solutions. Innovations in voice commerce, edge computing, and 5G connectivity will further expand the capabilities of AI in E-commerce, allowing for faster and more seamless interactions (Loghin *et al.*, 2020).

As E-commerce continues its AI-driven evolution, the importance of ethical considerations cannot be overstated (Vidhya *et al.*, 2024). The responsible use of AI involves addressing issues such as privacy, bias, and the potential societal impact of AI algorithms. Striking a balance between innovation and ethical considerations is crucial for building and maintaining trust with consumers and stakeholders. Ethical AI practices encompass transparent communication about data usage, clear consent mechanisms, and strategies to mitigate biases in algorithms. Companies need to prioritize fairness, accountability, and transparency throughout the development and deployment of AI systems. Ethical considerations extend beyond legal compliance, requiring a proactive approach to identify and rectify potential ethical dilemmas.

To achieve sustainable and responsible AI use in E-commerce, businesses should adopt a multifaceted approach; Incorporating ethical considerations into the design phase of AI systems ensures that responsible practices are ingrained from the outset. This includes diversity and inclusion in dataset creation, algorithmic decision-making transparency, and ongoing ethical impact assessments. Empowering users with control over their data and AI interactions fosters trust. Providing clear options for data management, allowing users to understand and control the personalization level, and enabling them to opt out of certain AI-driven features contribute to a user-centric and responsible approach. Implementing robust monitoring and evaluation mechanisms is crucial for identifying and rectifying ethical concerns. Regular audits of AI systems, feedback loops with users, and proactive measures to address biases or unintended consequences contribute to ongoing responsible AI use (Munoko *et al.*, 2020). Collaboration within the industry and adherence to ethical standards are essential for establishing norms and best practices. Engaging with

regulatory bodies, industry associations, and independent auditors can contribute to the development of ethical guidelines and frameworks that benefit the entire E-commerce ecosystem.

In conclusion, the future of AI in E-commerce is marked by exciting innovations and technological advancements. However, these innovations must be accompanied by a commitment to responsible AI use. Striking a balance between innovation and ethical considerations is not only a moral imperative but also crucial for the sustained success and acceptance of AI-driven E-commerce (Ledro *et al.*, 2023). By embracing emerging trends, fostering responsible practices, and prioritizing user well-being, the E-commerce industry can usher in a future where AI serves as a catalyst for positive change.

7. Recommendation

The United States has been a trailblazer in harnessing the potential of Artificial Intelligence (AI) to reshape the E-commerce landscape. Key developments include the integration of advanced AI technologies such as machine learning, natural language processing, and predictive analytics. The USA's E-commerce giants, exemplified by companies like Amazon and Google, have pioneered dynamic pricing strategies, personalized customer experiences, and innovative inventory management systems. These developments have not only transformed the domestic E-commerce sector but have also exerted a profound influence on global practices. The impact of USA's AI developments on the global E-commerce landscape is undeniable. E-commerce platforms worldwide have been influenced by American innovations, adopting similar strategies to enhance customer experiences, streamline operations, and remain competitive. The adoption trends are not confined to developed markets; emerging E-commerce economies are also leveraging AI to leapfrog traditional retail models and establish themselves as competitive players in the digital marketplace. The USA's influence extends to shaping the competitive strategies of global E-commerce giants, setting benchmarks that resonate across borders. As the E-commerce sector continues to evolve, the importance of ongoing monitoring and adaptation to emerging trends cannot be overstated. The rapid pace of technological advancements in AI demands a proactive approach from E-commerce businesses worldwide. Continuous monitoring of industry developments, technological trends, and consumer behaviors is essential to stay ahead in the competitive landscape. Adaptation to emerging trends involves not only the integration of new AI technologies but also a commitment to ethical and responsible AI use. E-commerce platforms should prioritize user privacy, transparency, and fairness in algorithmic decision-making. The dynamic nature of the digital marketplace necessitates agile responses to changes in consumer preferences, market dynamics, and regulatory landscapes.

E-commerce businesses globally should continue to invest in AI research and development to stay at the forefront of technological innovation. This includes exploring emerging technologies, such as augmented reality, virtual reality, and advanced personalization techniques, to enhance the overall customer experience. Prioritizing ethical considerations in AI implementation is crucial. E-commerce platforms should establish clear guidelines for responsible AI use, including transparency in data handling, addressing biases, and providing users with control over their data. A commitment to ethical practices not only builds trust with consumers but also aligns businesses with evolving regulatory frameworks. Collaboration within the global E-commerce community is essential. Industry associations, regulatory bodies, and businesses should collaborate to establish common standards, share best practices, and address challenges collectively. This collaborative approach ensures a harmonized and ethical adoption of AI technologies across borders.

8. Conclusion

In conclusion, the developments in AI within the USA have left an indelible mark on the global E-commerce landscape. The influence of American innovations is evident in the strategies adopted by businesses worldwide, from personalized customer experiences to advanced inventory management. The future of E-commerce lies in a delicate balance between technological innovation and responsible AI use. By staying vigilant, adapting to emerging trends, and prioritizing ethical considerations, the global E-commerce community can collectively shape a future where AI enhances the digital shopping experience while fostering trust and accountability. Ongoing monitoring and adaptation will be key in navigating the evolving terrain of AI in E-commerce and ensuring sustained growth in this dynamic and transformative industry.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1]   Abushammala, S.N., Abushawish, H.F., Jalambo, M.O. and Maghari, A.Y., 2022. Transforming into Smart Business: The Role of Artificial Intelligence. In *Future of Organizations and Work After the 4th Industrial Revolution: The Role of Artificial Intelligence, Big Data, Automation, and Robotics* (pp. 81-102). Cham: Springer International Publishing.

[2]   Ahmadov, Y. and Helo, P., 2023. Deep learning-based approach for forecasting intermittent online sales. *Discover Artificial Intelligence*, *3*(1), p.45.

[3]   Allioui, H. and Mourdi, Y., 2023. Unleashing the potential of AI: Investigating cutting-edge technologies that are transforming businesses. *International Journal of Computer Engineering and Data Science (IJCEDS)*, *3*(2), pp.1-12.

[4]   Babayev, N. and Israfilzade, K., 2023. Creating complexity matrix for classifying artificial intelligence applications in e-commerce: New perspectives on value creation. *Journal of Life Economics*, *10*(3), pp.141-156.

[5]   Bala, S., Khalid, M.N., Kumar, H. and Shukla, V.K., 2022. The practical enactment of robotics and artificial intelligence technologies in E-commerce. In *Cyber Intelligence and Information Retrieval: Proceedings of CIIR 2021* (pp. 455-467). Springer Singapore.

[6]   Banerjee, S. and Dutta, A., 2023. 4. The United States and China: The Strategic Competition and Response. *China's BRI in Different Regions of the World: Cooperation, Contradictions and Concerns*, p.4.

[7]   Becher, S., Gerl, A., Meier, B. and Bölz, F., 2020. Big picture on privacy enhancing technologies in e-health: a holistic personal privacy workflow. *Information*, *11*(7), p.356.

[8]   Castillo, M.J. and Taherdoost, H., 2023. The Impact of AI Technologies on E-Business. *Encyclopedia*, *3*(1), pp.107-121.

[9]   Cheng, L., Varshney, K.R. and Liu, H., 2021. Socially responsible ai algorithms: Issues, purposes, and challenges. *Journal of Artificial Intelligence Research*, *71*, pp.1137-1181.

[10]   Daraojimba, C., Abioye, K.M., Bakare, A.D., Mhlongo, N.Z., Onunka, O. and Daraojimba, D.O., 2023. Technology and innovation to growth of entrepreneurship and financial boost: a decade in review (2013-2023). *International Journal of Management & Entrepreneurship Research*, *5*(10), pp.769-792.

[11]   Du, S. and Xie, C., 2021. Paradoxes of artificial intelligence in consumer markets: Ethical challenges and opportunities. *Journal of Business Research*, *129*, pp.961-974.

[12]   Furr, N., Ozcan, P. and Eisenhardt, K.M., 2022. What is digital transformation? Core tensions facing established companies on the global stage. *Global Strategy Journal*, *12*(4), pp.595-618.

[13]   Hallema, D.W., 2022. The Global Nexus: Bridging Science, Technology, and Business in the World Journal. *International Multidisciplinary Journal of Science, Technology & Business*, *1*(02), pp.22-28.

[14]   Haqqi, H. and Murdani, A.D., 2023. The Relations of Economic-Political Power to the Development of Digital Economy in Asia. *Jurnal Ekonomi dan Bisnis Digital*, *2*(2), pp.583-602.

[15]   He, X. and Liu, Y., 2024. Knowledge evolutionary process of Artificial intelligence in E-commerce: Main path analysis and science mapping analysis. *Expert Systems with Applications*, *238*, p.121801.

[16]   Ikhtiyorov, F., 2023. Navigating AI's Potential in E-Commerce: Legal Regulations, Challenges, and Key Considerations. *Agrobiotexnologiya Va Veterinariya Tibbiyoti Ilmiy Jurnali*, *2*(5), pp.41-49.

[17]   Ilugbusi, S., Akindejoye, J.A., Ajala, R.B. And Ogundele, A., 2020. Financial liberalization and economic growth in Nigeria (1986-2018). *International Journal of Innovative Science and Research Technology*, *5*(4), pp.1-9.

[18]   Jacobides, M.G., Brusoni, S. and Candelon, F., 2021. The evolutionary dynamics of the artificial intelligence ecosystem. *Strategy Science*, *6*(4), pp.412-435.

[19]   Jean, R.J.B., Kim, D., Zhou, K.Z. and Cavusgil, S.T., 2021. E-platform use and exporting in the context of Alibaba: A signaling theory perspective. *Journal of International Business Studies*, pp.1-28.

[20]   Jiang, W., 2023. Enhancing Operational Efficiency in E-Commerce Through Artificial Intelligence and Information Management Integration. *Revue d'Intelligence Artificielle*, *37*(6).

[21]   Kamal, M. and Himel, A.S., 2023. Redefining Modern Marketing: An Analysis of AI and NLP's Influence on Consumer Engagement, Strategy, and Beyond. *Eigenpub Review of Science and Technology*, *7*(1), pp.203-223.

[22] Kejriwal, M., 2022. AI in Industry Today. In *Artificial Intelligence for Industries of the Future: Beyond Facebook, Amazon, Microsoft and Google* (pp. 47-73). Cham: Springer International Publishing.

[23] Kumar, D., 2023. The Use of Artificial Intelligence in Data Analysis and Business Intelligence. In *AI and Emotional Intelligence for Modern Business Management* (pp. 311-320). IGI Global.

[24] Kumar, V., Ramachandran, D. and Kumar, B., 2021. Influence of new-age technologies on marketing: A research agenda. *Journal of Business Research*, *125*, pp.864-877.

[25] Kunz, W.H. and Wirtz, J., 2023. Corporate digital responsibility (CDR) in the age of AI: implications for interactive marketing. *Journal of Research in Interactive Marketing*.

[26] Lari, H.A., Vaishnava, K. and Manu, K.S., 2022. Artifical Intelligence in E-commerce: Applications, Implications and Challenges. *Asian Journal of Management*, *13*(3), pp.235-244.

[27] Ledro, C., Nosella, A. and Dalla Pozza, I., 2023. Integration of AI in CRM: Challenges and guidelines. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(4), p.100151.

[28] Loghin, D., Cai, S., Chen, G., Dinh, T.T.A., Fan, F., Lin, Q., Ng, J., Ooi, B.C., Sun, X., Ta, Q.T. and Wang, W., 2020. The disruptions of 5G on data-driven technologies and applications. *IEEE transactions on knowledge and data engineering*, *32*(6), pp.1179-1198.

[29] Mithra, A.S., Duddukuru, V.C. and Manu, K.S., 2023. How artificial intelligence is revolutionizing the banking sector: The applications and challenges. *Asian Journal of Management*, *14*(3), pp.166-170.

[30] Munoko, I., Brown-Liburd, H.L. and Vasarhelyi, M., 2020. The ethical implications of using artificial intelligence in auditing. *Journal of Business Ethics*, *167*, pp.209-234.

[31] Ntumba, C., Aguayo, S. and Maina, K., 2023. Revolutionizing Retail: A Mini Review of E-commerce Evolution. *Journal of Digital Marketing and Communication*, *3*(2), pp.100-110.

[32] Perera, A. and Iqbal, K., 2021. Big Data and Emerging Markets: Transforming Economies Through Data-Driven Innovation and Market Dynamics. *Journal of Computational Social Dynamics*, *6*(3), pp.1-18.

[33] Puntoni, S., Reczek, R.W., Giesler, M. and Botti, S., 2021. Consumers and artificial intelligence: An experiential perspective. *Journal of Marketing*, *85*(1), pp.131-151.

[34] Rane, N., 2023. Enhancing Customer Loyalty through Artificial Intelligence (AI), Internet of Things (IoT), and Big Data Technologies: Improving Customer Satisfaction, Engagement, Relationship, and Experience. *Internet of Things (IoT), and Big Data Technologies: Improving Customer Satisfaction, Engagement, Relationship, and Experience (October 13, 2023)*.

[35] Rashidin, M.S., Gang, D., Javed, S. and Hasan, M., 2021. The role of artificial intelligence in sustaining the e-commerce ecosystem: Alibaba vs. Tencent. *Journal of Global Information Management (JGIM)*, *30*(8), pp.1-25.

[36] Sá, M.M.D., Miguel, P.L.D.S., Brito, R.P.D. and Pereira, S.C.F., 2020. Supply chain resilience: the whole is not the sum of the parts. *International Journal of Operations & Production Management*, *40*(1), pp.92-115.

[37] Salhab, H., Allahham, M., Abu-AlSondos, I., Frangieh, R., Alkhwaldi, A. and Ali, B., 2023. Inventory competition, artificial intelligence, and quality improvement decisions in supply chains with digital marketing. *Uncertain Supply Chain Management*, *11*(4), pp.1915-1924.

[38] Schwartz, R., Vassilev, A., Greene, K., Perine, L., Burt, A. and Hall, P., 2022. Towards a standard for identifying and managing bias in artificial intelligence. *NIST special publication*, *1270*(10.6028).

[39] Shin, D., Lim, J.S., Ahmad, N. and Ibahrine, M., 2022. Understanding user sensemaking in fairness and transparency in algorithms: algorithmic sensemaking in over-the-top platform. *AI & SOCIETY*, pp.1-14.

[40] Shukla, S., Bisht, K., Tiwari, K. and Bashir, S., 2023. Comparative Study of the Global Data Economy. In *Data Economy in the Digital Age* (pp. 63-86). Singapore: Springer Nature Singapore.

[41] Soliman, M. and Al Balushi, M.K., 2023. Unveiling destination evangelism through generative AI tools. *ROBONOMICS: The Journal of the Automated Economy*, *4*(54), p.1.

[42] Steinhoff, L. and Martin, K.D., 2023. Putting Data Privacy Regulation into Action: The Differential Capabilities of Service Frontline Interfaces. *Journal of Service Research*, *26*(3), pp.330-350.

[43] Vidhya, V., Donthu, S., Veeran, L., Lakshmi, Y.S. and Yadav, B., 2023. The intersection of AI and consumer behavior: Predictive models in modern marketing. *Remittances Review*, *8*(4).

[44] Vuong, N.A. and Mai, T.T., 2023. Unveiling the Synergy: Exploring the Intersection of AI and NLP in Redefining Modern Marketing for Enhanced Consumer Engagement and Strategy Optimization. *Quarterly Journal of Emerging Technologies and Innovations*, *8*(3), pp.103-118.

[45] Wang, C., Ahmad, S.F., Ayassrah, A.Y.B.A., Awwad, E.M., Irshad, M., Ali, Y.A., Al-Razgan, M., Khan, Y. and Han, H., 2023. An empirical evaluation of technology acceptance model for Artificial Intelligence in E-commerce. *Heliyon*, *9*(8).

[46] Yadav, D., 2023. Exploring Advancements in Language Understanding for Improved Human-AI Communication. *International Journal of Research Radicals in Multidisciplinary Fields, ISSN: 2960-043X*, *2*(2), pp.44-50.

[47] Yin, C. and Han, J., 2021. Dynamic Pricing Model of E-Commerce Platforms Based on Deep Reinforcement Learning. *CMES-Computer Modeling in Engineering & Sciences*, *127*(1).

[48] Youssef, H.A.H. and Hossam, A.T.A., 2023. Privacy Issues in AI and Cloud Computing in E-commerce Setting: A Review. *International Journal of Responsible Artificial Intelligence*, *13*(7), pp.37-46.

[49] Zhang, L. and Hänninen, M., 2022. Digital retail—key trends and developments. In *The Digital Supply Chain* (pp. 237-254). Elsevier.

[50] Zhang, X., Guo, F., Chen, T., Pan, L., Beliakov, G. and Wu, J., 2023. A Brief Survey of Machine Learning and Deep Learning Techniques for E-Commerce Research. *Journal of Theoretical and Applied Electronic Commerce Research*, *18*(4), pp.2188-2216