FUDMA International Journal of Social Sciences (FUDIJOSS), Volume 5, No. 2, September, 2025

A Publication of
The Faculty of Social Sciences, Federal University Dutsin-Ma,
Katsina State,
Nigeria

ISSN: 2735-9522 (Print)
2735-9530 (Online)

FUDMA International Journal of Social Sciences (FUDIJOSS)
Vol. 5, No. 2, September, 2025
ISSN: 2735-9522 (Print) ISSN :2735-9530 (Online)

FUDMA International Journal of Social Sciences (FUDIJOSS)
Vol. 5, No. 2, September, 2025
ISSN: 2735-9522 (Print) ISSN :2735-9530 (Online)

EDITORIAL AIM

FUDMA International Journal of Social Sciences (FUDIJOSS) is a bi-annual journal published by the Faculty of Social Sciences, Federal University Dutsin-Ma, Katsina State, Nigeria. FUDIJOSS is intended for scholars who wish to report results of completed or ongoing research,book review, review of the literature and discussions of theoretical issues or policy in all areas of Economics, Geography, Regional Planning, Political Sciences, Sociology, Demography, GenderStudies, and Management Sciences. Therefore, the primary objective of this journal is to providea forum for the exchange of ideas across disciplines and academic orientations in the social sciences, and other related disciplines.

EDITORIAL POLICY

Manuscripts submitted for publication in FUDIJOSS are considered on the understanding that they are not under consideration for publication elsewhere, and have not already been published.The publishers of FUDIJOSS do not accept responsibility for the accuracy of the data presented in the articles or any consequences that may arise from their use. Opinions expressed in articles published by FUDIJOSS are solely those of the authors.

AUTHOR GUIDELINES

Submission to FUDMA International Journal of Social Sciences (FUDIJOSS)

Articles submitted to FUDIJOSS should be written in English Language (a consistent use of US or UK grammar and spelling) and should normally be between three thousand (3,000) to eight thousand (8,000) words (including all elements, abstract, references). If English is not theauthor's mother tongue, please arrange proofreading by a native English speaker before submission. Submitted manuscripts should contain a concise and informative title; the name(s) ofthe author(s); the affiliation(s) and address (es) of the author(s); the e-mail address and telephonenumber(s) of the corresponding author. Contributions are received with the understanding that they comprise of original, unpublished material and have not been submitted/considered for publication elsewhere. All submissions should be sent electronically as email attachment to fudijoss@gmail.com. Submissions must be accompanied with evidence of payment of an assessment fee of ₦10,000 or 25 (USD). Manuscripts are accepted throughout the year.

Abstract

A concise abstract of not more than two hundred and fifty (250) words and to be followed immediately by four to six (4-6) keywords which should not be a repetition of the title. The abstract should not contain any undefined abbreviations or unspecified references.

Text

Manuscripts should be typed, double spaced in MS Word for Windows format, font size 12, Times New Roman with 2.5cm margins, and organized under appropriate section headings. All headings should be placed on the left-hand side of the text. All figures, tables, etc. should be inserted at the appropriate locations in the text. Only three levels of headings are accepted in the text. All measurements should be given in metric units. Acknowledgements may be made brieflyjust before the list of references only on the revised final manuscript.

Tables and Figures

a. All illustrations other than tables are to be numbered consecutively as Figures (e.g. graphs, drawing and photographs) using Arabic numerals.

b. Photographs and other illustrations will be reproduced in black and white unless otherwise agreed with the editors. Only online versions of the article will appear in colour.

c. All Figures and Tables are to be referred to in the text by their number.

Citations in Text

Cited references in the text are to be cited in the text using the surname(s) of the author(s) followed by the year of publication of the work referred to, for example: Mustafa (2019), (Ati, 2016), (Dimas & Akuva, 2020) or for references to page (Mustafa, 2020, p. 15). In case of more than two authors use name of first author followed by "*et al*." (Yecho *et al.*, 2017). If several works are cited, they should be organized chronologically, starting with the oldest work.

References: Use the American Psychological Association (APA)StyleGeneral Guide

The items in the reference list should be presented alphabetically with the last name of the author,followed by the author's initials.

Books

Abdulsalam A. Sikiru (2022) Research methods in Economic and Social Science, Lexinting Printing Press, Califonia, USA.

Obadahun O. Simon (2024) The Basics of Administration and Politics, ABU Press, Zaria, Kaduna State.

Badiru Abdulahi (2024) Introduction to Economics, Longman, London, UK.

Edited Book

McDowell, L. & Sharp, J. P. (Eds.) (1999). *A feminist glossary of human geography*. New York,NY: Oxford University Press.

Book Chapter

Abaje, I. B., Ati, O. F. & Iguisi, E. O. (2012). Changing Climatic Scenarios and Strategies for Drought Adaptation and Mitigation in the Sudano-Sahelian Ecological Zone of Nigeria. In Iliya, M. A., & Dankani, I. M. (Eds). *Climate Change and Sustainable Development in Nigeria* (pp 99– 121). Ibadan: Crown F. Publishers.

Journal Articles

Dimas, G. & Akuva, I. I. (2020). Leadership styles of Nelson Mandela as a pattern for African leaders. *Covenant University International Journal of Politics and International Affairs*, 8(1), 49-64.

Journal Article Accessed Online
Bayer, J. (2010). Customer segmentation in the telecommunications industry. *Journal of Database Marketing & Customer Strategy Management, 17*,247 – 256. doi: 10.1057/dbm.2010.21

Corporate Author
Institute of Chartered Accountants in Australia. (2004). *AASB standards for 2005: equivalents toIFRSs as at August 2004*. Sydney, Australia: Pearson Education.

All correspondences and enquiries should be directed to:The Editor-in-Chief
FUDMA International Journal of Social SciencesFaculty of Social Sciences
Federal University Dutsin-Ma, Katsina State, NigeriaEmail:fudijoss@gmail.com

Publication Fee
Publication fee is ₦30,000 or 150 (USD).

Subscriptions and Marketing
Three issues of FUDIJOSS would be published per year, in April, September and December, by the Faculty of Social Sciences, Federal University Dutsin-Ma, Katsina State, Nigeria.
Annual subscriptions (2023): Nigeria, ₦10,000 (Individuals), ₦15,000 (Institutions). Outside, 35 (USD)(Individuals); 100 (USD) (Institutions).
Single Issues (2023): Nigeria ₦5,000 (Individuals) ₦8,000 (Institutions). Outside, 25 (USD) (Individuals); 65 (USD) (Institutions).

For advertising and other marketing details, contact:
The Business Editor
FUDMA International Journal of Social SciencesFaculty of Social Sciences
Federal University Dutsin-Ma, Katsina State, Nigeria Email:fudijoss@gmail.com

FUDMA International Journal of Social Sciences (FUDIJOSS)
Vol. 5, No. 2, September, 2025
ISSN: 2735-9522 (Print) ISSN :2735-9530 (Online)

GENERATIVE ARTIFICIAL INTELLIGENCE AND LOGISTICS SYSTEM IN NIGERIA: A LITERATURE REVIEW AND DIRECTION FOR FUTURE RESEARCH

Kabiru, Abdullahi [1]
kabiru.abdullahi@kasu.edu.ng; +2347037765032

Ibrahim Labaran Ali (Ph.D) [2]
Ibrahim.L.A.Ali@warwick.ac.uk; **+44786469737**

Ismail lawal [3]
Ismail.lawal@kasu.edu.ng; **+234 706 055 9051**

Bello Idris Sambo [4]
Idris.bello@kasu.edu.ng; **+234 803 639 0784**

Yusuf Ja'afar (Ph.D) [5]
jaafaryusuf2015@gmail.com; **+234 806 518 9645**

[1,3]Department of Procurement and Supply Chain Management, Faculty of Management Sciences, Kaduna State University (KASU), Kaduna State Nigeria

[2]WMG, University of Warwick, United Kingdom

[4]Department of Accounting, Faculty of Management Sciences, Kaduna State University (KASU), Kaduna State Nigeria

[5]Department of Finance and Accounts, National Board for Arabic and Islamic Studies (NBAIS) Headquarters, Rigachikun Kaduna-Nigeria

ABSTRACT

The role played by Generative Artificial Intelligence (Gen AI) in shaping numerous aspects of life endeavors cannot be underestimated. These includes but not limited to logistics and supply chain management system in Nigeria. This study assessed the impact of Generative Artificial Intelligence on Logistic system in Nigeria. The study employed an exploratory research design to provide a conceptual and literature review perspective of generative AI and logistic system in Nigeria. The paper was organized into four major sections viz; introduction, literature review, challenges and limitations to generative artificial intelligence and logistic system in Nigeria, directions for future research agenda. Based on the results from the review of previous literatures, it is crystal clear that none of the previous studies have examined the impact of generative AI on logistic system in Nigeria. Indeed, resistance to change, decaying level of digital infrastructure, compliance, and regulatory obstacles have been identified as the major challenges confronting the smooth implementation of generative AI on logistics system in Nigeria. Hence, the need to study the nexus between generative Artificial Intelligence and logistic system in Nigeria with a view to provide an insights for future research direction. Therefore, this study underscores the importance of Gen AI in the area of logistics system in Nigeria as emerging economy.

Keywords: Artificial Intelligence, Logistic System, Technological Innovation, Future Research Agenda, Nigeria.

FUDMA International Journal of Social Sciences (FUDIJOSS)
Vol. 5, No. 2, September, 2025
ISSN: 2735-9522 (Print) ISSN :2735-9530 (Online)

Introduction

In Nigeria, logistic system based on generative artificial intelligence (AI) is considered to be powerful mechanisms to assist organizations address their activities (Odoh, 2025; Nair et al., 2024). A generative end-to-end procedure can tackle the potentials and challenges of all business activities, from acquisition to sales. Getting the most out of these solutions is not simply a matter of technology, however; organizations must take institutional measures to generate the full benefit from AI. Developing resilient logistic system that can survive and promptly recover from disruptions is a key expectation for many organizations, especially in the emergence of current global issues (Seelos et al., 2024; Olutuase et al., 2022). The COVID-19 pandemic has underscored weaknesses in global logistic system, necessitating a reappraisal of procedures and increased attention on flexibility and uncertainty management (Shen et al., 2024; Mooghali et al., 2024).

Generative artificial intelligence (AI) is on the brink to transform Africa's logistic system, offering unprecedented opportunities to transform processes, spark innovation, and tackle enduring challenges (Shen et al., 2024). This study delves into the nexus between generative AI and logistic system in Nigeria, analyzing its potential to enhance efficiency, transparency, and competitiveness. With its remarkable ability to create content, predict trends, and automate complex tasks, generative AI promises to optimize logistic system, improve supply chain and inventory control, strengthen predictive analytics for better demand forecasting, and streamline customs and regulatory compliance (Seelos et al., 2024). Again, generative AI can transform logistic financing by providing more genuine risk appraisal and stimulating faster, more secured transactions (Olutuase et al., 2022). One of the most interesting gains of generative AI in logistic system is its power or ability to open-access to international markets for Nigerian businesses, especially small and medium-sized enterprises (SMEs) and informal businesses. These groups normally encounter several challenges to entry, such as restricted access to market data, financing, and efficient logistics (Musa et al., 2025).

Generative AI can upgrade the playing ground by offering data-oriented thoughts, enhancing efficient decision-making, and providing cost-effective digital instruments for market entry (Murungu et al., 2024). This not only improves the competitiveness of Nigerian businesses but also enhances economic growth inclusion. Although, the journey to fully leveraging generative AI in Nigerian logistic system is rocked with obstacles. Technological development has been a key impediment, with many emerging countries like Nigeria, Ghana, Benin Republic, amongst others, being deprived of digital inclusion and data processing capacities (Nwosu & Ekoh-Nweke, 2025).

Recent research emphasizes the integration of digital technologies such as the Internet of Things- IoT, artificial intelligence- AI, and block-chain to enhance logistic system visibility and resilience (Kumar, & Singh, 2023). AI-driven solutions can analyze huge volumes of data, understand relationships, provide visibility into operations, and support better decision-making AI a potential game-changer (McKinsey Report, 2021; Martinez & Gupta, 2023). Similarly, Miller (2023) identified the potential of emerging technologies in transforming logistic system processes, building resilience, and maintaining operational flexibility to adapt to future challenges of firms. Another study by Khoa and Toai (2024) has identified the role of artificial intelligence in optimizing logistic system planning and decision making enabling the organization to tackle the complexities of modern logistic system. Thisstudy stressed that AI solutions can be deployed in the logistic system to analyze historical data and market trends to predict future demand accurately.

FUDMA International Journal of Social Sciences (FUDIJOSS)
Vol. 5, No. 2, September, 2025
ISSN: 2735-9522 (Print) ISSN :2735-9530 (Online)

Prior studies have identified a linkage between technological advancement and logistic systems with mixed findings. A study by Hu and Yao (2023) using Chinese companies has found that technological innovation has significantly improved logistic systems efficiency and sustainability. A study by Ifekandu and Ifekandu (2024) revealed that value innovation significantly impacted product availability, on-time delivery, and logistic system flexibility of food and beverage firms in South-South Nigeria. A similar study by Pereira and Shafique (2024) using humanitarian organizations in Pakistan found that the use of artificial intelligence – big data analytical capabilities significantly enhance information alignment and logistic system agility.

The use of artificial intelligence offers promising solutions to promote logistic system visibility by deploying data analytics, machine learning, and real-time monitoring in logistic operations. However, implementing artificial intelligence presents several challenges for Nigerian Breweries Heineken International. Artificial Intelligence requires large information from multiple stakeholders, such as suppliers, manufacturers, and logistics service providers for training and decision-making. In the case of the Nigerian Brewery PLC, collecting accurate and comprehensive data on various parameters such as temperature, fermentation rates, and ingredient quality can be difficult. Ensuring that the collected data is clean, consistent, and free from errors is critical. Poor data quality can lead to inaccurate predictions and suboptimal Outcomes which would in turn affect logistic system visibility. Therefore, poor quality of data poses several challenges for logistic system visibility. In addition, many organizations use legacy systems and equipment that may not be compatible with modern AI technologies. Integrating AI with these systems can be complex and costly. Furthermore, developing and implementing AI solutions requires specialized knowledge in both AI and organizational processes. Organizations may need to invest in training their staff to understand and work with AI technologies, which can be time consuming and expensive. Finding professionals with expertise in both fields can be challenging. Poor data quality and skill gaps can affect the implementation of logistic systems. To the best of the researchers' knowledge, there is none of the previous studies such as Arinse et al. (2025), Odoh et al. (2025) amongst others, which attempted to examine the impact of Generative AI on logistics systems in the Nigerian context. Hence, providing improving the existing body of knowledge and avenue for further research agenda in this area.

Literature Review

This section begins with the review of conceptual issues such as the concept of Artificial Intelligence (AI), Technological Innovation, Logistic System. It concludes with the critical review of latest and prominent studies from the extant literatures.

Conceptual Review

Artificial Intelligence (AI)

Artificial Intelligence is defined as the use of computer systems to carry out activities usually requiring human intelligence (Scott, 2024). According to Pushkar (2024), artificial intelligence deals with the deployment of machines to undertake numerous functions using human intelligence. AI is a segment of machine learning and deep learning, and these technologies have their individual arrangements of tasks while equipping machines. AI is transforming logistic system by improving efficiency and transparency in demand forecasting, logistics maximization, and risk management (Lenovo Story Hub, 2024). These activities consist of learning, reasoning, problem solving, opinion, and language appreciation. Algorithms are component of the pattern of artificial intelligence, where simple algorithms are employed in

FUDMA International Journal of Social Sciences (FUDIJOSS)
Vol. 5, No. 2, September, 2025
ISSN: 2735-9522 (Print) ISSN :2735-9530 (Online)

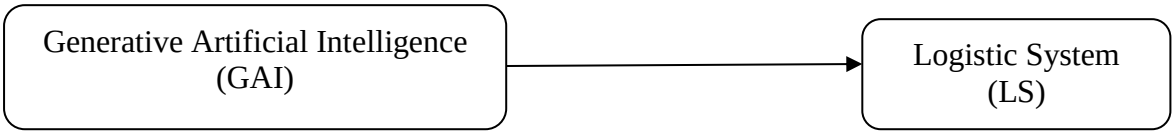
simple tasks, while more complex ones assist in framing potent artificial intelligence. Artificial intelligence technology is obvious in computers that play chess, self-driving cars, and banking systems to identify deceptive activity. This technology enable machines to learn on their own from past data and the data given, make sense of it, and use this data to perform numerous business activities. An AI-based technology with the help of Logistic System Intelligence (LSI) can continuously analyze logistic data to identify potential issues and resolve them in real time. AI is transforming logistic visibility by introducing numerous amounts of data from various sources to provide end-to-end transparency.

In the context of this study, generative Artificial Intelligence (AI) can be viewed as the application of the intelligence of machine software instead of the human intelligence in performing tasks.

Technological Adoption

Technology adoption is defined as the process by which an innovation or new technology is accepted, integrated, and used by an individual, group, or organization (Hu & Yao, 2023; Hall, & Khan, 2003). It encompasses the entire cycle, from the initial awareness and interest in technology to its regular and proficient use. Technological adoption refers to the use of new technologies in operations and daily activities by individuals and organizations (Khoa & Toai, 2024; Oliveira et al., 2020). The integration and effective utilization of new technologies for businesses are geared towards enhancing their operations, improving productivity, and gaining competitive advantage (Rymarczyk, 2020). The adoption of new technology is relevant in the logistic system in predicting logistic providers' and clients' ability to accept and use new logistic technologies and systems, to improve logistic outcomes and diagnostic tools. Technology adoption can assess clients' views of tele-logistic consultations, including concerns about privacy, security, and effectiveness. On the basis of the foregoing definitions, this study posits that technology adoption goes beyond just acquiring a new device or software. It deals with fully integrating technology into workflows, tasks, or daily routines to derive value from it.

Figure 1: *Conceptual Framework*



Review of Empirical Literature

In a recent research work conducted by Nwosu and Ekoh-Nweke (2025), they examines the types and uses of the various forms of AI which include the Narrow AI, Artificial General Intelligence, Artificial Super Intelligence, Reaction Machine Intelligence, Limited Memory Artificial Intelligence, Theory of Mind AI and Self Aware AI. It was found that the introduction and application of AI in entrepreneurship practice enhances efficiency and reliability in service delivery with its consequential elimination of human errors and disappointments. However, the study was exclusively based on the impact of AI on entrepreneurship practice in Nigeria. Hence, no emphasis was given to the area of logistic system in Nigeria. Therefore, this study attempts to consider the impact of generative AI on logistic system in Nigeria.

In another recent study, Arinze et al. (2025) focused on threefold investigation; to improve supply chain efficiency for SMEs in the downstream petroleum sector, to reduce environmental impacts through reduced carbon emissions, and to ensure cost-effective transport and distribution processes. The methodology includes developing a robust AI driven model utilizing supervised and unsupervised learning techniques, followed by simulation testing on real-world logistics data. Anticipated outcomes of the TDOM implementation include a 20-30% reduction in transport costs, a significant decrease in fuel consumption, and improved supply chain resilience for SMEs. Although, the emphasis of this study was based on the impact of AI on logistic system in the Nigerian downstream petroleum sector. The study therefore, lacks empiricisms despite being an empirical study.

Odoh (2025) explores the opportunities, challenges, and ethical considerations associated with deploying AI in the digital communication strategies of e-commerce companies, using three case studies of Konga, Jumia and Jiji. The chapter recommends that e-commerce companies integrate AI tools responsibly. The study revealed that AI is capable of fostering sustainable growth and development in emerging economies in Nigeria. Indeed, the decaying level of technological infrastructure has been observed as the major obstacle hindering the smooth implementation of e-commerce in Nigeria. Although, the specific component of e-commerce has not been clearly stated in the study.

Musa et al. (2025) examining the importance of AI technologies while outlining the prospects and problems in vaccine supply chain management in Africa. The findings of the study revealed that AI has the potential to increase productivity by streamlining logistics and inventory management, but it is hampered by issues with data privacy and technology infrastructure. On the other perspective, Murungu (2024) examined the impact of generative AI on trading activities in Africa. It was found that public-private partnerships can drive AI innovation and implementation, fostering a collaborative ecosystem that supports sustainable development. However, their emphasis was based on the impact of generative AI on trading activities in Africa. The study therefore, indicates a knowledge gap and lack of specification of clear domain for the study. This study intends to fill in the gaps by considering the link between generative AI and logistic system in the context of Nigeria.

Ola-Oluwa (2024) explored the impact of AI on knowledge sharing and organizational efficiency within Nigerian businesses, emphasizing the practical implications of AI integration. A survey was conducted, with two hundred and thirty-four (234) respondents from diverse industries providing feedback through questionnaires. The data collected was analyzed using both descriptive and inferential statistics. Hypothesis testing revealed a positive correlation between AI-driven knowledge sharing and organizational efficiency, with AI technologies enabling faster and more accessible information flow. The findings revealed that AI has the potential to optimize knowledge sharing, helping employees make more informed decisions and fostering a collaborative work environment. Nevertheless, the findings of the study lack external validity as it was restricted to knowledge sharing and organizational efficiency of enterprises in Nigeria. The aforementioned knowledge gap therefore, can be covered by examining the impact of generative AI on logistic system in Nigeria.

In another vein, Daudu et al. (2024) employed a qualitative method to bolster their argument that smart cities in Africa have progressed over the years and positively influenced African digital space and beyond. It also argue for generative artificial intelligence as an empowering tool in boosting smart cities in Africa and as a problem-

solving tool for the likely challenges of smart governance of which African Luddite attitude towards technology are included.

In their empirical study, Ugwu and Balogun (2024) focuses on evaluating the influence of the adoption of technological advancement on supply chain management in Selected Nigerian Brewery Plc, South-East Zone Nigeria. The research employed a survey design and questionnaire as instruments for data collection. The total population of the study comprised 2,100 staff of the organization. Taro Yamane method was used to estimate the sample size which produced a result of 336. A proportionate allocation formula was applied in the distribution of the survey in the following states: River State, Bayelsa, Akwa Ibom, Delta, and Edo State, Nigeria. Out of 336 copies of a questionnaire sent to the participants, only 321 were returned and utilized for the study while the remaining 15 copies were not utilized for this study. The study hypotheses were statistically tested and analyzed using Pearson correlation methods at a 5% significance level. The findings of research hypothesis one indicates that artificial intelligence (AI) adoption positively contributes to supply chain visibility (SCV) in the South-East Nigerian Breweries. However, the findings of the study cannot be generalized to other non-consumer goods companies such as the oil and gas companies, banks, insurance companies, industrial goods companies, amongst others. Hence, this study seeks to explore the potential impact of generative AI on the logistic system in Nigeria.

Mathew et al. (2024) concentrated on the cooperation between humans and robots in the fields of education bringing up the Research and Education Network (REN) for universities as a way to capitalize on human development. The outcome of the study found significant issues with the current REN and made an effort to resolve them through human-robot collaboration by tackling them from an organizational and pedagogical AI-robotic instructional application in light of the technological prospects highlighted in the study.

Analysis of Gaps in Literature

A careful analysis of the previous literatures have shown that very few studies like Arinze et al. (2025), Musa et al. (2025), Seelos et al. (2024), Shen et al. (2024), Ugwu and Balogun (2024), Liddel (2024), Ifekandu and Ifekandu (2024), Khoa and Toai (2024), Addy (2023), Miller (2023), Kumar and Singh (2023), Martinez and Gupta (2023), and Olutuase et al. (2022) have examined the impact of AI on logistic system in Nigeria and other emerging countries. However, the aforementioned studies have documented mixed results with lack of empiricisms and external validity as the major flaws. However, prior research works by Daudu et al. (2024), Hu and Yao (2023), Li et al. (2023), Dzubak and Hanzelka (2022) have focused greater attention on the conceptual framework and literature review perspectives vis-à-vis application of generative AI in different environmental settings. Hence, they lack empiricisms or inferential evidences.

The remaining dimension of the previous studies were the work of Nwosu and Ekoh-Nweke (2025), Mathew et al. (2024), Murungu (2024), and Ola-Oluwa (2024), have examined the impact of generative AI on entrepreneurship, Knowledge sharing, and trading activities. On the basis of the above, it is crystal clear that none of the previous studies have examined the impact of generative AI on logistic system in Nigeria. Hence, the need to study the nexus between generative Artificial Intelligence and logistic system in Nigeria with a view to provide an insights for future research direction.

FUDMA International Journal of Social Sciences (FUDIJOSS)
Vol. 5, No. 2, September, 2025
ISSN: 2735-9522 (Print) ISSN :2735-9530 (Online)

Challenges and Limitations to Generative AI and Logistics System in Nigeria

The generation of AI into logistic system in Nigeria encounters considerable challenges that can hinder effective implementation. These challenges can be categorized into various segments:

(i) Infrastructure limitations Technological infrastructure:
Many logistic systems, particularly in resource-limited settings, lack the essential technological infrastructure necessary for AI generation. This includes insufficient hardware, software, and network capabilities critical for effective AI operations (Olutuase et al., 2022; Nair et al., 2024).
Data quality and availability: AI requires access to high-quality, comprehensive datasets to function optimally. However, in numerous regions, data collection systems are often fragmented or absent, resulting in significant gaps that hinder the effectiveness of AI applications (Seelos et al., 2024; Džubák & Hanzelka, 2022).

(ii) Data and security Privacy concerns:
The need for AI systems to access vital logistic information raises significant privacy issues. Ensuring the security of logistic data is a major challenge as these systems can be vulnerable to data breaches and unauthorized access (Shen et al., 2024; Mooghali et al., 2024).
Regulatory compliance: Compliance with stringent data protection regulations such as GDPR in Europe and HIPAA in the United States complicates AI implementation. These regulations demand rigorous protocols for data handling and storage, which can slow down the integration process (Kudrenko, 2024; Addy, 2023).

(iii) Lack of Technical expertise:
There is a notable shortage of professionals skilled in developing, implementing, and maintaining AI systems within healthcare environments. This gap includes both technical experts in AI and logistics professionals trained to effectively utilize these technologies (Kudrenko, 2024; Bates, 2024).
Training and education: Ongoing education and training programs are vital for equipping logistic personnel with the necessary skills to leverage AI effectively. However, such programs are usually insufficient or lacking entirely (Seelos et al., 2024; Bates, 2024).

(iv) Stakeholder trust and collaboration Trust in AI systems:
Establishing trust among logistic providers, clients, and other stakeholders is essential for successful generative AI. Concerns about the reliability and transparency of AI systems can hinder their acceptance and widespread adoption (Hu et al., 2022; Li et al., 2023).
Collaboration barriers: Successful AI implementation requires collaboration among various stakeholders, including logistic providers, IT professionals, and policymakers. Misalignment of goals and poor communication can significantly impede progress (Seelos et al., 2024).

(v) Deficiencies in governmental support Policy and regulation:
The lack of clear policies and regulatory frameworks governing the use of AI in healthcare creates uncertainty that can slow down implementation efforts. Governments must establish guidelines that promote innovation while ensuring safety and efficacy (Seelos et al., 2024; Addy, 2023).

Funding and investment: Adequate funding is crucial for supporting AI initiatives. Many logistic systems, particularly in low-income countries, face financial constraints that obstruct their ability to invest in necessary AI technologies (Kudrenko, 2024; Nair et al., 2024).

FUDMA International Journal of Social Sciences (FUDIJOSS)
Vol. 5, No. 2, September, 2025
ISSN: 2735-9522 (Print) ISSN :2735-9530 (Online)

Directions for Future Research Agenda

Furthermore, data privacy, security, and ethical considerations must be addressed to ensure responsible AI deployment. Developing robust regulatory and policy frameworks is essential to support generative AI while safeguarding against potential risks. Additionally, the skills gap poses a challenge, necessitating substantial investment in digital literacy and capacity-building programs to equip the workforce with the necessary skills to leverage AI technologies. The policy implications of generative AI in trade are profound. Governments and stakeholders must collaborate to develop supportive regulatory frameworks that encourage AI innovation while protecting against misuse. Investment in digital infrastructure and connectivity is crucial to bridge the digital divide and ensure equitable access to AI technologies.Specifically, this study underscores the demand for continuous improvement in logistic systems across Nigeria to enhance logisticoutcomes for ever-demanding stakeholders through the following areas:

(i) Infrastructural development in the technological sector;
(ii) Enhancing data quality, availability and security;
(iii) Investing technical expertise;
(iv) Building trust, support and collaboration among stakeholders, including governments at all levels;
(v) Implementing of AI Technologies in Logistic system.

REFERENCES

Addy, E. O. (2023). Zipline's drone delivery service revolutionizing healthcare logistics. *African Development Bank Group, 3*(1), 20-38.

Arinze, C. A., Agho, M. O., Eyo-Udo, N. L., Abbey, A. B. N., & Onukwulu, E. C. (2025). AI-Driven Transport and Distribution Optimization Model (TDOM) for the downstream petroleum sector: enhancing SME supply chains and sustainability. *Journal of Contemporary Research, 11*(4), 102-120.

Bates, A. (2024). AI-based supply chain optimization to cut costs in pharma. Retrieved from: https://www.linkedin.com/pulse/ai-based-supply-chain-optimization-cut-costspharma-dr-andr%C3%A9e-bates

Daudu, B. O., Osimen, G. U., & Anaiye, E. B. (2024). Sustainable Smart Cities in African Digital Space. In *Artificial Intelligence and Machine Learning for Sustainable Development* (pp. 100-111). CRC Press.

Džubák, P., & Hanzelka, J. (2022). Artificial intelligence implementation in healthcare: a theory-based scoping review of barriers and facilitators. *Journal of Artificial Intelligence, 7*(1), 1-18.

Gates Foundation (2022). Nigeria Governors' Forum. Available at: https://www. gatesfoundation.org/about/committed-grants/2022/05/inv045022.

Hall, B. H., & Khan, B. (2003). Adoption of new technology. *The New Economy Handbook, 5*(3), 521-546.

Hu, H., & Yao, C. (2023). Technology innovations in supply chains: unlocking sustainability and social developmental goals advancement. *Environmental Science and Pollution Research, 30*(11), 102725 – 102738.

Hu, H., Xu, J., Liu, M., and Lim, M. K. (2022). Vaccine supply chain management: An intelligent system utilizing blockchain, IoT and machine learning. *Journal of Business. Research, 15*(6), 113 – 480.

Ifekandu, C.C., & Ifekandu, I. C. (2024). Frugal innovation strategies and supply chain performance of food and beverage firms in South-South Nigeria. *International Journal of Entrepreneurship and Business Innovation, 7*(2), 193-212.

Khoa, N., & Toai, N. (2024). The Role of Artificial Intelligence in Optimizing Supply Chain Management. *Journal of Supply Chain Innovation, 12* (3), 45-62.

Kudrenko, I. (2024). E3S web of conf, 471. Gewerbestrasse, Switzerland: Springer International Publishing Ag.05020

Kumar, S., & Singh, A. (2023). IoT in supply chain management: Real-time visibility and cost savings. *International Journal of Logistics Management, 34*(1), 75-90.

Lenovo Story Hub (2024). Lenovo uses AI and machine learning to build an ultra-resilient

supply chain. Retrieved Online from https://news.lenovo.com/ai-machine-learning-build-ultra-resilientsupply-chain/

Li, T., Wang, Y., and Zhang, Y. (2023). Technical/Algorithmic Stakeholder Society (TASS) barriers to the application of artificial intelligence in medicine: a systematic review.

Liddell, P. (2024). Supply chain trend: digital shake-up. *Journal of Computing, Management, and Technological Studies (JCMTS), 3*(2), 29-64.

Martinez, R., & Gupta, V. (2023). Big data analytics in supply chain management: Enhancing efficiency and customer satisfaction. *Big Data Journal*, *19*(3), 202-218.

Matthew, U. O., Oyekunle, D. O., Akpan, E. E., Oladipupo, M. A., Chukwuebuka, E. S., Adekunle, T. S., ... & Onumaku, V. C. (2024). Generative Artificial Intelligence (AI) on Sustainable Development Goal 4 for Tertiary Education: Conversational AI With User-Centric ChatGPT-4. 259-288.

McKinsey & Company (2021). Succeeding in the artificial intelligence supply chain revolution. Retrieved Online from https://www.mckinsey.com/industries/metals-and-mining/ourinsights/succeeding-in-the-ai-supply-chain-revolution

Miller, A. (2023). Robotic Process Automation in modern supply chains. *Automation Today, 42* (4), 89-99.

Mooghali, M., Khosravi, A., Khosravi, S., Barry, B. A., Grimshaw, A. A., Ross, J. S., et al. (2024). Trustworthy and ethical AI-enabled cardiovascular care: a rapid review. BMC Med. Inf. Decis. Mak. 24, 247. doi:10.1186/s12911-024-02653-6

Murungu, E.(2024). Generative AI and Trade in Africa: Opportunities and Challenges. *OIDA International Journal of Sustainable Development*, *18*(02), 29-40.

Musa, S. M., Haruna, U. A., Aliyu, L. J., Zubairu, M., & Lucero-Prisno III, D. E. (2025). Leveraging AI to optimize vaccines supply chain and logistics in Africa: opportunities and challenges. *Frontiers in Pharmacology*, *16*(7), 141-153.

Nair, M., Muliya, V., Nair, S., & Nygren, J. M. (2024). A comprehensive overview of barriers and strategies for AI implementation in healthcare: mixed-method design. PLoS One 19, e0305949. doi:10.1371/journal.pone.0305949NPHCDA (2024). Resources. Available at: https://nphcda.gov.ng/resources.

Nwosu, C. D. G., & Ekoh-Nweke, A. C. (2025). Application of artificial intelligence in entrepreneurship practice in Nigeria. *Multidisciplinary Journal of Vocational Education and Research, 7*(1), 1-11.

Odoh, A. (2025). Demystifying the Role of Artificial Intelligence in the Digital Communication Strategy of Nigeria's E-commerce Industry. *Journal of Media and Communication Systems for Sustainability in Nigeria*, *5*(3), 209-232.

Ola-Oluwa, J. A. (2024). Impact of artificial intelligence (AI) in enhancing knowledge sharing and boosting organizational efficiency in Nigerian enterprises. *African Journal of Management and Business Research*, *17*(1), 76-95.

Oliveira, T., Thomas, M., & Espadanal, M. (2014). Assessing the Determinants of Cloud Computing Adoption: An Analysis of the Manufacturing and Services Sectors. *Information & Management, 51*(5), 497-510.

Olutuase, V. O., Iwu-Jaja, C. J., Akuoko, C. P., Adewuyi, E. O., and Khanal, V. (2022). Medicines and vaccines supply chains challenges in Nigeria: A scoping review. *BMC Public Health 22*(1), 12-36.

Pereira, E. T., & Shafique, M. N. (2024). The Role of Artificial Intelligence in Supply Chain Agility: A Perspective of Humanitarian Supply Chain. *Engineering Economics*, *35*(1), 77-89.

Pushkar, A. (2024). The benefits of artificial intelligence in healthcare. *International Journal of Scientific Research and Innovation, 4*(1), 1-11.

Rymarczyk, J. (2020). Technologies, opportunities and challenges of the industrial revolution 4.0: Theoretical considerations. *Entrepreneurial Business and Economics Review, 8*(1), 185-198.

Sato, R., Metiboba, L., Galadanchi, J. A., Adeniran, M. F., Hassan, S. H., Akpan, D., et al. (2023). Cost analysis of an innovative e-Health program in Nigeria: a case study of the vaccine direct delivery system. *BMC Public Health 23*(1), 16-31.

Scott, G. (2024). What is artificial intelligence? Retrieved from https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp#citation-2

Seelos, C., Huber, M. J., and Kauffmann, R. J. C. P. (2024). Optimizing vaccine supply chains using artificial intelligence. *Journal of Innovative Research, 11*(8), 1-16.

Shen, J., Bu, F., Ye, Z., Zhang, M., Ma, Q., Yan, J., et al. (2024). Management of drug supply chain information based on “artificial intelligence + vendor managed inventory” in China: Perspective based on a case study Front. *Journal of Pharmacology and Supply Chain, 15*(7), 36-53.

Ugwu, K. E., & Balogun, O. (2024). Navigating supply chain management: Technology adoption in Southeast Nigerian breweries. *Journal of Commerce Management and Tourism Studies, 3*(3), 231-243.