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ARTIFICIAL INTELLIGENCE IN NIGERIA: A PATHWAY FOR A NATION READY FOR PROGRESS

Kolawole Francis Ogunbodede

University of Africa, Bayelsa State, Nigeria

Corresponding authors: **kolawoleogunbodede@yahoo.com**

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ABSTRACT

Nigeria, Africa's most populous nation, presents significant opportunities for the adoption of artificial intelligence (AI) technologies due to its youthful population and growing digital ecosystem. However, despite substantial advancements in technology adoption and the increasing interest in AI applications, Nigeria faces critical challenges that limit the full realization of AI's potential to address socio-economic issues. This study examines the current state of AI adoption in Nigeria, identifies challenges hindering its development and application, and provide suggestions on how to enhance AI utilization in the country. The qualitative research method was used for this study. The study reviewed existing literature to explore the current state of AI adoption and the challenges in the development and application of AI in Nigeria. The papers were analyzed in review context, and keywords were focused on the title and research objectives. Findings reveal emerging adoption of AI technologies across diverse sectors such as education, libraries, digital marketing, banking, agriculture, and construction. However, challenges such as inadequate infrastructure, limited funding, shortage of skilled AI professionals, data scarcity, and ethical concerns significantly impede the successful implementation of AI. To foster AI adoption in Nigeria, the study suggests investments in digital infrastructure, funding, and workforce development; improved data governance; and the establishment of clear regulatory frameworks. Addressing these challenges is crucial to harnessing AI's potential for sustainable economic growth, enhanced public services, and improved quality of life in Nigeria.

KEYWORDS

Artificial Intelligence, Nigeria.

Introduction

Nigeria is the most populated African nation with over 200 million people and the seventh biggest in the world, according to the Nigeria Multidimensional Poverty Index (2022). The United Nations Department of Economic and Social Affairs (2019) predicts that by 2050, Nigeria's population will have doubled, making it the third biggest nation in the world. Nigeria's economy is the largest in Africa, with a GDP of 362.81 billion US dollars in 2023 (World Bank, 2023). The nation has a relatively young demographic, with a median age of only 18.1 years. In recent years, Nigeria has made significant progress in technology adoption, with a growing number of internet users and mobile phone subscribers. As of the first quarter of 2024, Nigeria had over 164 million active internet users and 219 million mobile phone subscribers (Nigeria Bureau of Statistics, 2024). This widespread internet and mobile phone usage suggests a strong foundation for digital services and potentially artificial intelligence (AI)-powered applications.

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Nigeria is a lower-middle-income country with a developing economy. While the GDP has grown steadily in recent years (World Bank, 2024), significant socioeconomic disparities exist. Poverty remains a major concern, with nearly half of those people having an income that is insufficient to cover basic living expenses. By the end of 2024, around 40.7% of Nigerians would be living below the international poverty line (World Bank, 2024). However, the country has the potential to address these challenges by implementing AI in a variety of sectors. Artificial intelligence (AI) can boost agricultural productivity by implementing precision agriculture tools and techniques, thereby improving food security and increasing farmers' efficiency (Adepoju, 2022). Additionally, AI can enhance healthcare delivery by providing solutions like Explainable AI (XAI) to overcome challenges in the health sector, ultimately contributing to improved maternal and newborn health outcomes (Hanauer, 2024). Moreover, the adoption of AI can generate new job prospects and drive economic growth, offering a pathway to mitigate poverty and promote sustainable development in Nigeria.

Recognizing AI's transformative potential, the Nigerian government has launched several initiatives, such as the National AI Strategy 2020-2030 and the National Centre for AI and Robotics, underscoring Nigeria's commitment to AI advancement (Omogbai, 2024). This framework fosters research, development, and adoption through policy frameworks, funding, and talent development. Additionally, the government established the National Information Technology Development Agency (NITDA) to drive the digital economy agenda. In 2022, NITDA called for public contributions to draft the National AI policy (Gyem, 2022). According to NITDA, the AI policy aims to provide direction on how Nigeria leverages AI, including its development, use, and adoption, to proactively build a sustainable digital economy. Moreover, several states, such as Lagos and Edo, are implementing policies and projects to attract ICT investments and create an enabling business climate (International Trade Administration, 2023). These efforts demonstrate the Nigerian government's strong commitment to leveraging technology and innovation to transform the economy and improve the lives of its citizens.

Nigeria's research and innovation ecosystem is growing, with several universities establishing AI research centers. According to a report by EduRank (2024), the University of Ibadan, the University of Nigeria, and Covenant University are among the leading institutions conducting cutting-edge AI research. For example, the Covenant University in Nigeria is working in tandem with OBTranslate to conduct research and development across several domains, including AI (Covenant University & OpenBinacle Group, 2023). Additionally, private companies in Nigeria are increasingly exploring AI applications. Currently, the healthcare, agricultural, and financial services industries are the primary focus of most solutions (Okonkwo & Ade-Ibijola, 2021). The Nigerian federal government is appealing to the business community for help in establishing an artificial intelligence fund with the goal of enhancing the country's technical capacity (Akintaro, 2023) via increased investment.

Conversely, Nigeria still faces several challenges in terms of technology adoption and innovation. The country struggles with infrastructural issues, such as limited access to reliable electricity and high-speed internet in many regions, which hinder technology adoption and innovation (Oghuvbu et al., 2022; Ekeinde et al., 2022; Tallapragada & Adebusuyi, 2008). Research funding remains limited compared to developed countries, with the government allocating only around 0.2% of GDP to R&D activities (Echono, 2023). Other challenges include limited data access, a shortage of skilled AI experts, and a lack of clear and supportive regulations to ensure responsible and ethical AI development (Omogbai, 2024). Despite these obstacles, Nigeria's large population, growing tech ecosystem, and abundant natural resources present significant opportunities for AI-driven innovation and development.

Nevertheless, in spite of the recognized importance of AI in the development of any nation, there is a remarkable gap in research concerning the adoption of AI in various sectors in Nigeria. This study aims to bridge this gap by examining the current state of AI adoption across various sectors in Nigeria, identifying the challenges that impede the development and application of AI in Nigeria, and offering recommendations on the most effective strategies for implementing AI in Nigeria. The study will add to the current literature on AI adoption in Nigeria and offer useful and significant information to governments, policymakers, and private sectors on how to harness AI to drive sustainable economic growth. Therefore, this study examines the adoption of AI in Nigeria as a pathway for progress.

Statement of the Problem

Despite Nigeria's significant strides in technology adoption, including the growing interest in AI, the country still faces substantial challenges that hinder the full realization of AI's potential to address pressing socio-economic issues. Nigeria's large and youthful population, coupled with its status as Africa's largest economy, presents a unique opportunity for AI-driven solutions to enhance food security, healthcare, financial inclusion, and overall economic sustainability. However, the nation grapples with structural impediments such as unreliable electricity, inadequate internet connectivity, and insufficient research funding, which collectively stifle innovation and the widespread adoption of AI technologies (Oghuvbu et al., 2022; Ekeinde et al., 2022; Echono, 2023). Moreover, the scarcity of AI professionals, limited access to data, and the absence of clear policies governing responsible AI use further exacerbate these challenges. While the government has initiated programs like the National AI Strategy 2020-2030 and established institutions such as the National Centre for AI and Robotics, these efforts alone may not be sufficient to overcome the existing barriers. The problem, therefore, lies in the disconnect between Nigeria's potential for AI-driven development and the existing infrastructural, educational, and policy-related constraints that prevent the effective deployment and utilization of AI technologies. To harness AI to drive sustainable economic growth, improve public services, and enhance the quality of life for Nigeria's citizens, it is crucial to address this gap.

Objectives of the Study

The specific objectives of the study include:

- ✓ To examine the current state of AI adoption across various sectors in Nigeria
- ✓ To ascertain the challenges that impede the development and application of AI technologies in Nigeria.

Research Questions

The following questions guided the study:

- ✓ **What is the current state of AI adoption across various sectors in Nigeria?**
- ✓ **What are the challenges** that impede the development and application of AI technologies in Nigeria?

Literature Review

This literature review is based on two main principles that serve as the framework for this literature review: the current state of AI adoption in Nigeria, the challenges that hinder the development and application of AI technologies in Nigeria, and the strategies for enhancing AI development and utilization in Nigeria.

The Current State of AI Adoption in Nigeria

Onyanabo (2024) explores the transformative potential of AI in Nigeria's educational sector. The study leverages qualitative data from existing literature, case studies from other developing countries, and expert interviews with educators, policymakers, and technologists in Nigeria. Select Nigerian schools are piloting AI applications such as adaptive learning systems, automated administrative tools, and intelligent tutoring systems, according to the data. Similarly, Bali (2024) investigated the emerging trends in AI education in Nigeria. The methodology relies on a comprehensive examination of the latest advancements in artificial intelligence applications within the Nigerian educational context. Research shows that many Nigerian schools are using artificial intelligence tools, such as Moodle, evolutionary software modeling, multimedia e-learning frameworks, and performance prediction for students. This discernible pattern points to an increasing need for AI applications in Nigeria's educational system. Akinola (2023) also looked at Nigerian academic libraries and how they may use AI, as well as the potential consequences of doing so. To investigate AI's potential and effects on academic libraries, the study reviewed the relevant literature. Among the many AI techniques uncovered by the research are robots, machine learning, big data, and natural language recognition. In a similar study, Oyetola et al. (2023) explored AI's prospective uses and consequences for modern library services in Nigeria. Research shows that academic libraries in Nigeria are missing out on AI's potential since they haven't implemented it.

In another study, Nyong (2023) examined the role of AI in enhancing digital marketing in Nigeria. This study employed the qualitative research method. The show's findings reveal that most marketers and companies are familiar with the prominent AI tools and are utilizing them to enhance their business and customer experience. Nnaomah et al. (2024) conducted a comprehensive analysis on the application of AI and its impact on risk management within the banking industries of the US and Nigeria. This study compiles and analyzes relevant material, such as case studies, industry reports, and academic studies, to provide an overview of where AI stands in risk management at the moment. On the other hand, there are still obstacles that have prevented the Nigerian banking industry from fully adopting AI.

Similarly, Deji et al. (2023) looked at how extension workers in Nigeria utilize AI-based technologies to help with agricultural programs. The results demonstrate that agricultural extension experts did not make extensive use of digital technologies based on AI for agricultural extension services. The use of artificial intelligence in Nigeria's construction sector was the subject of research by Owolabi et al. (2022). Generative designs in building information modeling (BIM), measurement and estimation software, and sensors in intelligent buildings were the most often cited AI applications by survey takers. Furthermore, the study area identified design and project planning as the most critical AI requirements. Overall, the research highlights the increasing interest and emerging adoption of AI technologies in various sectors of the Nigerian economy, including education, libraries, digital marketing, banking, agriculture, and building/construction. However, the level of adoption and implementation varies in the Nigerian context.

Challenges in the Development and Application of AI Technologies in Nigeria

Onyanabo (2024) highlighted issues with AI implementation in Nigerian schools. Inadequate infrastructure, limited resources, slow internet, and reluctance to change educator and policymaker attitudes towards technology are all barriers to overcome. Okunade (2024) identified several problems that prevent the integration of AI into scientific education in Nigeria, including inadequate infrastructure, poorly qualified educators, and ethical considerations. Similar to what Akinola (2023) discovered, academic libraries in Nigeria faced a number of obstacles when trying to use AI. These included high costs, a lack of cultural acceptance, inadequate network connection, privacy and ethical concerns, and a general reluctance to change. According to the IMF, Nigeria does not have the necessary digital infrastructure to implement AI systems (Akintaro, 2024). The main impediments to the use of AI in Nigeria are the shortage of AI researchers and data analysts; a scarcity of data; inadequate internet connectivity; and high implementation costs (Olaoluwa, 2024; Omogbai, 2024). Nonetheless, Nigeria must make efforts to enhance the development of AI talent, infrastructure, legal frameworks, research grants, and better synergism in order to harness the potential of AI for economic development (Okpanum & Omeihe, 2024; Ekhator, 2024; Okonny, 2023).

Overcoming the challenges of AI adoption in Nigeria could have profound socio-economic impacts across various industries. In the education sector, AI could enable personalized learning experiences, allowing students to progress at their own pace and address their unique needs, ultimately improving academic performance and knowledge retention (Alabi, 2024). Additionally, by automating administrative tasks and offering data-driven insights, AI supports teachers in focusing more on instruction and student engagement, easing their workload and enhancing the quality of teaching (Cleopas, 2023). In healthcare, AI could improve diagnostic accuracy, streamline administrative processes, and enhance patient care through predictive analytics and personalized treatments (Alowais, 2023; Kennedy, 2023). In agriculture, AI-powered technologies could optimize farming practices, increase crop yields, and reduce resource wastage, boosting food security and agricultural productivity. In the financial sector, AI could enhance fraud detection, streamline banking operations, and improve financial inclusion by providing tailored services to underserved populations (Jabbour et al., 2023). Manufacturing industries would benefit from AI-driven automation and predictive maintenance, leading to greater efficiency and reduced operational costs. Similarly, in transportation, AI can optimize logistics, traffic management, and the development of

autonomous systems, improving mobility and reducing costs. Overall, AI adoption across these sectors would lead to increased innovation, enhanced productivity, and greater economic diversification. It would attract foreign investment, create new jobs, and position Nigeria as a leader in the adoption of emerging technologies, contributing to long-term socio-economic development and reducing inequality.

Adoption of AI in Nigeria and other Countries in Africa

The adoption of AI in Nigeria and other African nations is a multifaceted issue, encompassing both significant opportunities and considerable challenges. This analysis delves into the current landscape of AI adoption across the continent, focusing on Nigeria as a case study while also highlighting trends in other African countries. Various sectors across Africa are increasingly integrating AI technologies, with notable advancements in countries like Nigeria, South Africa, Kenya, and Ghana. For instance: Nigeria has emerged as a leader in attracting AI seed funding, particularly in the fintech sector, with over $140 million raised by around 20 AI start-ups (Arakpogun et al., 2020). The country launched its Centre for Artificial Intelligence in 2020 to spearhead AI development (Gwagwa et al., 2020). South Africa boasts the highest number of AI start-ups (26), indicating a robust ecosystem that supports innovation and development. Kenya has also made strides, particularly in healthcare and agriculture, showcasing how AI can enhance service delivery and operational efficiency (Ade-Ibijola & Okonkwo, 2023; Gwagwa et al., 2020). Despite these advancements, the overall adoption of AI across the continent remains low compared to developed nations. A 2019 government AI readiness index indicated no African country ranked among the top 50 globally (Arakpogun et al., 2020).

However, in August 2024, the African Union (AU) approved a Continental Artificial Intelligence Strategy aimed at promoting AI adoption across member states. This strategy emphasizes governance, skills development, and infrastructure enhancement over two phases from 2025 to 2030. The strategy strives to establish a cohesive environment for AI development, all the while upholding ethical standards (Onyekachi, 2024). The trajectory of AI adoption in Nigeria and other African countries presents a complex interplay between opportunity and challenge. While there is significant potential for economic growth and social improvement through AI technologies, addressing infrastructure deficits, skills shortages, regulatory gaps, and cultural attitudes will be crucial for realizing this potential. The recent AU strategy marks a pivotal step toward fostering an environment conducive to sustainable AI development across the continent.

Methodology

The study used a qualitative approach. The study reviewed existing literature to examine current level of AI acceptance as well as the difficulties associated with AI research, development, and implementation in Nigeria. The study looked at articles via a review lens, with an emphasis on the titles and research aims as keywords. Qualitative research aims to mainly provide analytic results that do not include numerical values. The process comprises gathering a large amount of narrative data to better understand the phenomenon of interest.

Discussion

The first research question revealed a growing interest and emerging adoption of AI in various sectors of the Nigerian economy, including education, libraries, digital marketing, banking, agriculture, and building/construction. However, the level of adoption and implementation varies in the Nigerian context, which may be due to the country's unique challenges. Research question two shows that the acceptance of AI in Nigeria faces several challenges related to infrastructure, funding, human capital, data availability, and ethical considerations, which need to be addressed for successful implementation. The combination of infrastructure deficiencies, financial constraints, human capital shortages, data scarcity, and ethical considerations creates a challenging environment that hinders the successful adoption and implementation of AI technologies in the Nigerian educational sector and academic libraries.

Conclusion

The research revealed a growing interest and emerging adoption of AI technologies across various sectors of the Nigerian economy, including education, libraries, digital marketing, banking, agriculture, and construction. However, the level of adoption and implementation varies significantly within the Nigerian context, likely due to the country's unique challenges. The adoption of AI in Nigeria faces significant obstacles related to infrastructure deficiencies, funding constraints, human capital shortages, data availability, and ethical considerations. These interconnected challenges create a difficult environment that hinders the successful adoption and implementation of AI technologies, particularly in the Nigerian educational sector and academic libraries.

The findings underscore the growing interest in and emerging adoption of AI technologies across key sectors of the Nigerian economy, including education and libraries. However, the varying levels of AI adoption, particularly in the educational sector, reflect significant challenges such as infrastructural deficiencies, funding constraints, shortages in human capital, data accessibility, and ethical concerns. Addressing these challenges through targeted policies and strategic investments could accelerate the adoption of AI across these sectors. For instance, improving infrastructure, increasing funding for AI research and education, and developing data-sharing frameworks could position Nigeria as a leader in AI in Africa. By fostering innovation and collaboration between government, academia, and the private sector, Nigeria could overcome these obstacles and serve as a model for other African nations. This approach would not only enhance the country's global competitiveness in AI but also unlock its potential to drive economic development and educational transformation.

Suggestions

According to the research, the best ways to get Nigeria to use AI are to invest in telecommunications and digital infrastructure to make AI deployment work; set aside dedicated funding and look into public-private partnerships to support AI research and implementation in libraries and schools; improve STEM education and train people to become skilled AI workers; support ethical AI applications by investing in high-quality data collection and governance; and create regulatory frameworks to deal with issues like algorithmic bias and

data privacy. By addressing these interconnected challenges, Nigeria can create an enabling environment for successful AI adoption in the education and library sectors, driving the country's digital transformation and competitiveness.

For instance, countries like Estonia and Singapore have made significant investments in digital infrastructure, creating robust platforms for AI integration in public sectors, including education. Singapore's AI strategy emphasizes public-private partnerships and targeted investments in STEM education, positioning it as a global leader in AI adoption. For instance, the Singapore government has partnered with Google Cloud to accelerate its national AI strategy, focusing on developing AI capabilities within the public sector through initiatives like the Artificial Intelligence Government Cloud Cluster (Hao, 2023). Similarly, Finland has concentrated on building digital literacy and AI skills among its workforce through national initiatives such as "Elements of AI," a free online course aimed at upskilling citizens (Singapore Government, 2023). Finland's commitment to equipping its population to effectively engage with AI technologies is evident in this course. Nigeria can learn from these examples to develop tailored strategies to overcome its unique challenges and become a leader in AI adoption across Africa. For instance, adopting Singapore's model of fostering public-private partnerships could enhance collaboration between government and tech industries, while Finland's emphasis on digital literacy could inform educational reforms aimed at preparing a skilled workforce for the future (Pereira, 2023)

Reference

Ade-Ibijola, A., Okonkwo, C. (2023). Artificial intelligence in Africa: Emerging challenges. In: Eke, D.O., Wakunuma, K., Akintoye, S. (eds) Responsible AI in Africa. Social and Cultural Studies of Robots and AI. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031 -08215-3_5

Adepoju, O. (2022). Food security in Nigeria: Enhancing workers' productivity in precision agriculture. *Journal of Digital Food, Energy & Water Systems*, 3(2).

Adesina, Isaac, Okunade. (2024). The role of artificial intelligence in teaching of science education in secondary schools in Nigeria. *European Journal Of Computer Science And Information Technology*. https://doi.org/10.37745/ejcsit2013/vol12n15767

Akinola, S. A. (2023). Capabilities and apparent implications of AI adoption in Nigerian academic libraries. *University Library at a New Stage ofSocial Communications Development. Conference Proceedings*, (8), 283–289. https://doi.org/10.15802/unilib/2023_293813

Akintaro, S. (2023). FG seeks private sector partnership to launch AI fund in Nigeria. https://nairametrics.com/2023/11/23/fg-seeks-private -sector-partnership-to-launch-ai-fund-in-nigeria/

Akintaro, S. (2024, June 27). IMF says Nigeria, other developing countries lack digital infrastructure for AI. https://nairametrics.com/2024/06/27/imf-says-nigeria- other-developing-countries-lack-digital-infrastructure-for-ai/.

Akpan, A. G. (2015). Adoption of artificial intelligence methods in manufacturing companies (A case study of Nigerian Bottling Company, Port-Harcourt Nigeria). (Master's thesis, National Open University if Nigeria) Available from: https://www.researchgate.net/publication/32921298_Adoption_of_Artificial_Intelligence_Methods_iManufacturing_Companies-case_Study_of_Nigerian_Bottling_company_PortHarcourt_Nigeria.

Alabi, O. (2024, June 21). Experts canvass adoption of AI in education. Punch. https://punchng.com/experts-canvass-adoption-of-ai-in education/

Alowais, S. A., Alghamdi, S. S., Alsuhebany, N. et al. (2023). Revolutionizing healthcare: the role of artificial intelligence in clinical practice. *BMC Med Educ*., 23(689). https://doi.org/10.1186/s12909-023-04698-z

Anijekwu, C., and Ajayi, J. (2024). 29% Nigerian fintechs adopt generative AI Report. https://commercium.africa/news/2024/03/29-nigerian-fintechs-adopt-generative-ai-report/

Arakpogun, E. O., Elsahn, Z., Olan, F., & Elsahn, F. (2020). Artificial intelligence in Africa: challenges and opportunities. https://researchportal.northumbria.ac.uk/ws/portalfiles/portal/31309999/AI_in_Africa_Opportunities_and_Challenges_Pa er_68_Manuscript.pdf

Bali, B. (2024). Analysis of emerging trends in articial intelligence in education in Nigeria. https://www.researchgate.net/publication/377059683_Analysis_of_Emerging_Trends_in_Artificial_Intelligence_in_Educati on_in_Nigeria

Bunza, S. S. (2023, May 25th). Challenges of artificial intelligence to legal practice in Nigeria. https://naijabarrister.com/articles/challenges-of-artificial-intelligence-to-legal-practice-in-nigeria-vcr8w8g

Cleopas, C. B. (2023). Advent of artificial intelligence: prospects and challenges in Nigeria education system. *GPH-International Journal of Educational Research*, 6(06), 01-09. https://doi.org/10.5281/zenodo.8114160

Covenant University & OpenBinacle Group (2023, April 14). Research: Covenant University partners OBTranslate. https://www.linkedin.com/pulse/research-covenant-university-partners-obtranslate

Dahlia, K. (2024). How Nigeria can leverage the rise of fintech for economic progress. https://blogs.worldbank.org/en/psd/how-nigeria can-leverage-the-rise-of-fintech-for-economic-progre

Deji, O., Dorcas, Lola, Alabi., Michael, Famakinwa., E., Faniyi. (2023). Utilization of artificial intelligence-based technology for agricultural extension services among extension professionals in Nigeria. *The Journal of Agricultural Extension*, 27(3). https://doi.org/ 10.4314/jae.v27i3.9

EduRank (2024). 66 Best universities for Artificial Intelligence (AI) in Nigeria. https://edurank.org/cs/ai/ng/

Echono, S. T. (2023). Funding research in a developing economy: text of 21st convocation lecture of the Nigerian defense academy in honour of graduating cadets of 70 regular course and postgraduate students delivered on Thursday

14th September 2023. https://tetfund.gov.ng/wpcontent/uploads/2023/10/final - CONVOCATION-LECTURE-FUNDING-RESEARCH-IN-A - DEVELOPING-ECONOMY-ES-SPEECH.pdf

Ekeinde, E. B., Okujagu, D. A., Chenaboso, D., and Agbawodikeizu, C. (2022). The Nigerian Power Grid and Impediments to Power Revolution in Nigeria." Paper presented at the SPE Nigeria Annual International Conference and Exhibition, Lagos, Nigeria, August 2022. https://doi.org/10.2118/211931-MS

Ekhator, O. (2024, April 4). Nigeria enlists 120 experts to develop a framework for AI adoption. https://techpoint.africa/2024/04/04/nigeria-enlists-experts - framework-ai-adoption/

Gwagwa, A., Kraemer-Mbula, E., Rizk, N., Rutenberg, I., & De Beer, J. (2020). Artificial intelligence (AI) deployments in Africa: Benefits, challenges and policy dimensions. *The African Journal of Information and Communication*, 26, 1-28. https://doi.org/10.23962/10539/30361

Hanauer, M. (2024). Enhancing healthcare delivery with explainable AI: A methodological leap forward. https://medeanalytics.com/blog/enhancing-healthcare-delivery -with-explainable-ai/

Hao, Y. Z. (2023). Singapore partners with Google Cloud to accelerate national AI strategy. https://govinsider.asia/intl-en/article/singapore-partners-with-google-cloud-to-accelerate-national-ai-strategy

International Trade Administration (2023). Information and Communications Technology. https://www.trade.gov/country-commercial-guides/nigeria-information-and-communications-technology

Ibrahim, F. O. (2023, April 5). The impact of emerging AI technologies on Nigerian education. https://susafrica.com/2023/04/05/the-impact-of-emerging-ai-technologies-on-nigerian-education/

Jabbour S, Fouhey D, Shepard S, et al. (2023). Measuring the impact of AI in the diagnosis of hospitalized patients: A randomized clinical vignette survey study. *JAMA*, 330(23), 2275–2284. https://doi.org/10.1001/jama.2023.22295.

Kennedy, S. (2023). AI achieves high diagnostic accuracy in virtual primary care setting.

Nnaomah, U. I., Odejide, O. A., Aderemi, S., Olutimehin, D. O., Abaku, E. A., & Orieno, O. H. (2024). AI in risk management: An analytical comparison between the U.S. and Nigerian banking sectors. *International Journal of Science and Technology Research Archive*, 2024, 06(01), 127–146. https://doi.org/10.53771/ijstra.2024.6.1.0035

Nigeria Multidimensional Poverty Index (2022). Executive summary. https://nigerianstat.gov.ng/elibrary/read/1241254

Nigeria Bureau of Statistics (2024). Telecoms data: Active voice and internet per state, porting and tariff information (Q1 2024): Key highlight. https://nigerianstat.gov.ng/elibrary/read/1241528

Nyong, T. E. (2023). Role of artificial intelligence in enhancing digitalmarketing in Nigeria. *AKSU Journal of Communication Research*, 9(1), 74-90.

Oghuvbu, E. A., Gberevbie, D. E., Oni, E. O. (2022). Technology Policy and Sustainable Development in Nigeria. Vestnik RUDN. *International Relations*, 22(2), 385-396. https:doi.org/10.22363/2313-0660- 2022-22-2-385-396

Okonkwo, C.W., and Ade-Ibijola, A., 2021. Chatbots applications in education: A systematic review. Computers and Education: Artificial Intelligence, 100033.

Okonny, K. (2023, April 28). The promise and challenges of artificial intelligence in Nigeria's Economy. https://www.linkedin.com/pulse/promise-challenges-artificial-intelligence-nigerias-economy-okonny

Okpanum, I., & Omeihe, K. O. (2024, May 29). Artificial Intelligence in Nigeria: How ready are we? https://businessday.ng/opinion/article/artificial-intelligence -in-nigeria-how-ready-are-we/

Olaoluwa, J. (2024, April 15). Next Wave: Is Nigeria ready for the AI revolution. https://techcabal.com/2024/04/15/is-nigeria -ready-ai/

Omogbai, M. (2024). The Emerging Nigerian AI industry: A land of opportunity for investors. https://www.linkedin.com/pulse/emerging-nigerian-ai industry-land-opportunity-omogbai-martins-yjdgf

Onyanabo, T. (2024). Educational transformation in Nigeria through AI: Prospects and challenges. Researchgate. https://www.researchgate.net/publication/381732461

Onyekachi, N. (2024). Artificial intelligence: African Union council approves AI adoption in public and private sectors in Nigeria others. https://nairametrics.com/2024/08/09/artificial-intelligence-african-union-council-approves-ai-adoption-in-public-and-private-sectors-in-nigeria-others/

Owolabi, et, al. (2022). Application of artificial intelligence in the Nigerian building and construction industry. *International Journal of Advanced and Applied Sciences*, 9(10):33-39. https://doi.org/10.21833/ijaas.2022.10.005

Oyetola, S. O., Oladokun, B. D., Maxwell, C. E., & Akor, S. O. (2023). Artificial intelligence in the library: gauging the potential application and implications for contemporary library services in Nigeria. *Data & Metadata*, 2:36, 1-6. https://doi.org/10.56294/dm202336

Pereira, J. (2023). Singapore's AI applications in the public sector: Six examples. *MBR Journal*. https://mbrjournal.com/2023/07/25/singapores-ai-applications-in-the-public-sector-six-examples/

Singapore Government. (2023). National AI strategy: Year 2023 report. Government of Singapore. https://file.go.gov.sg/nais2023.pdf

STEMFocus (2023). Artificial Intelligence for healthcare in Nigeria: Challenges and opportunities. https://www.linkedin.com/pulse/artificial-intelligence-healthcare-nigeria-challenges-opportunities

Stempel, G & Westley, B (2000). Research methods in mass communications. Englewood Cliffs, New Jersey, Prentice Hall

The National Digital Economy Policy and Strategy (2020). https://ndpc.gov.ng/Files/PolicyNational_Digital_Economy_Policy_and_Strategy.pdf

United Nations Department of Economic and Social Affairs (2015). World population projected to reach 9.7 billion by 2050 with most growth in developing regions, especially Africa - says UN. https://www.un.org/en/development/desa/population/pdf/events/other/10/World_Population_Projections_Press_Release-.pdf

Vota, W. (2024). ICT works: 9 ways artificial intelligence is improving nigeria's agriculture outcomes with smallholder farmers. https://www.ictworks.org/ai-improving-nigeria-agriculture/

World Bank (2023). GDP (current-US$)-Nigeria. https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=NG

World Bank (2024). Poverty & equity brief Nigeria. https://datacatalogfiles.worldbank.org/ddh-published/0064942/DR0092448/Global_POVEQ_NGA.pdf?versionId=2024-04-16T15:19:00.4018291Z