LAFIA JOURNAL OF LIBRARY AND INFORMATION SCIENCE
Volume 8, Number 2, 2025.
Available online ***https://journals.fulafia.edu.ng/index.php/ljlis***
ISSN: Print - 2814-0702, Online - 2814-0710
LJLIS

TURNING ARTIFICIAL INTELLIGENCE (AI) IDEAS INTO ACTIONS IN NIGERIAN ACADEMIC LIBRARIES

Dr. Grace Iyabo Nwokedi
University of Jos Library P.M.B 2084, Jos, Plateau State, Nigeria
Email: grace.nwokedi@yahoo.com
Phone number: 08107559389

Abstract
This paper examined the possibility of converting AI ideas into actions in Nigerian academic libraries. Literature revealed that AI offers numerous benefits to academic libraries because it can be used in almost all sections of an academic library, and can also be used to enhance academic library services. In the literature, there are evidences of the use of AI in a few academic libraries in Nigeria and beyond. In spite of the benefits that AI offers, for it to be widely implemented in Nigerian academic libraries, much need to be done. This is due to numerous constraints such as lack of funds; lack of skills and ethical issues associated with the process of turning AI ideas into actions in the academic libraries. However, these constraints can be addressed by soliciting for funds to launch the AI applications in the libraries, organizing staff training and workshops for the acquisition of necessary AI skills and development of AI ethics policies to guide the ethical use of AI by the libraries among others.
Keywords: Artificial Intelligence (AI), Ideas, *Nigerian academic libraries*

Introduction

In the past centuries and decades, the world has experienced three industrial revolutions and is currently experiencing the fourth. Industrial revolution is the process of change from an agrarian and handicraft economy to one dominated by industry and machine manufacturing. These technological changes usually introduce novel ways of working and living, and fundamentally transform society (The Editors of Encyclopaedia Britannica 2025).

The first industrial revolution started between 1760-1830. It was a period of technological advancement primarily in Great Britain that shifted societies from agrarian economies to ones dominated by machine manufacturing and industrial production. Key innovations included the steam engine, spinning jenny, and the development of iron and cotton industries, leading to mass production, new transport systems like canals and railways, and significant population growth alongside increased urban labour (Mohajan 2019).

The second industrial revolution was a period of rapid technological, scientific, and industrial growth between roughly 1870 and 1914, leading up to World War I. It built upon the innovations of the first industrial revolution. But was defined by new energy sources, advanced materials and mass production methods that fundamentally changed modern life (Jevons 1931; Turner 2024).

The third industrial revolution, also known as the digital revolution began in the 1950s to early 2000s was characterized by the rise of computers, microelectronics, and the Internet, fundamentally transforming industries and society from manual to automated, information-based processes (Smith, 2019; The Strategic Foresight Initiative 2013). The fourth industrial revolution

began around the early 2010s with key technological milestones in 2011 and 2012. The era or epoch is a fusion of physical, digital, and biological worlds through technologies like Artificial Intelligence, the Internet of Things, big data, and robotics. This integration creates a new era of "smart" systems, enhanced by advancements in cloud computing, autonomous vehicles, 3D printing, and biotechnology, leading to greater automation, interconnectedness, and efficiency across various sector (World Economic Forum 2025).

According to Manning (2020) the term "Artificial Intelligence" (AI) was first mentioned by Emeretus Stanford Professor John McCarthy in 1955, and was defined by him as "the science and engineering of making intelligent machines". AI is an academic discipline that emerged from the computer science discipline (Khaleed, Jebrel & Shwehdy, 2024). The beginning of AI as a discipline dates as far back as 1956 in a laboratory where a group of scientists made it the subject of an event entitled "The Darthmouth Summer Research Project on AI". With this project, these scientists formulated a research agenda that launched AI as a discipline (Sheikh, Prins & Schrijvers 2023). Today, AI is gaining rapid popularity all over the world because of its immense benefits to society.

Russell and Norvig (2020) noted that there is no generally accepted definition of the term AI. According to Sheikh et al. (2023) AI is commonly defined as a technology that enables machines to imitate various complex human skills. In 2019, the High-Level Expert Group on Artificial Intelligence proposed a more detailed definition of AI as:

> *"Software or hardware systems designed by humans that given a complete goal, act in the physical or digital dimensions by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information derived from the data and deciding the best action (s) to take to achieve the given goal".*

The evolving library

A library can be defined as a curated collection of resources, both physical and digital, organized for access, retrieval, and dissemination (Sona & Padhi 2020). As noted by Sturges and Neill (2013), libraries have functioned as custodians of cultural heritage, conserving codices, manuscripts, and other historical documents for future cohorts or generations. Moreover, libraries have played an essential role in supporting academic research and scholarly communication. Thereby, promoting innovation and intellectual investigation (Lor, 2012). Throughout history, libraries have been catalysts for enlightenment and social progress, providing access to information that empowers individuals and societies (Aabo, 2018).

Libraries have advanced from primeval repositories of clay tablets to modern digital centers, transitioning from physical storage to providing varied digital services and becoming community centers (Sona & Padhi 2020). Major changes include the invention of the printing press, the rise of public libraries in the 19th Century, and the 21st Century incorporation of the Internet, which transformed libraries into virtual and community spaces with new services like e-readers and 3D printing (Dixit, Dixit, Dixit & Pandey 2024). Thus, libraries are expected to evolve further through technologies like AI and virtual reality, acting as implementors of information and learning in evolving digital environments (Sona & Padhi 2020).

Artificial Intelligence ideas in academic libraries

According to Huang, Cox and Cox (2023) the idea of integrating AI into libraries has existed

since at least 1985, but interest has surged in the last five years. Kim (2019) mentioned that in 2016, the University of Rhode Island launched an *AI laboratory* in their library that provided intelligent experimental space and services for users, and the library has emerged as the pioneer library that has become successfully involved with AI. Thus, AI holds numerous potentials, prospects or possibilities in being used to perform various library tasks in various sections of the library such as:

1. Cataloguing: Ashikuzzaman (2023) submits that AI has the capability of being used in the cataloguing section to extract relevant metadata, categorize books, and suggest appropriate subjects for the books. AI can also be used to automate repetitive tasks in the cataloging section, thereby, allowing staff to focus on more complex activities (Jayachristraya & Hemapriyaa, 2023). Furthermore, AI can help with multilingual cataloguing in situations whereby collections are available in multiple languages (Hasan, Saifullah & Hashmi, 2024).
2. Serials: In the serials section, AI can be employed in offering abstracting services to users. This is possible because AI has the capability of creating concise summaries or abstracts, to aid users in quick understanding of the content of a document (Jayachristraya & Hemapriyaa, 2023).
3. Administration: AI has the potential to analyze data related to library operations and user behavior in order to provide valuable insights. These insights assist in making informed decisions about resource allocation, service improvements, and strategic planning, ultimately enhancing the overall efficiency and effectiveness of the library (Ashikuzzaman, 2023). AI can equally help with budgeting, planning and allocation by analysing past spending patterns and predicting future needs (Hasan et al., 2024).
4. Reference services: AI-powered voice recognition systems allow patrons to use voice commands to search the catalogue and access information (Ashikuzzaman, 2023). AI can also be employed for user analytics and personalization. The analytics provide insights into user behaviour, preferences, and needs. This is done through AI by collecting and analysing user data. This data-driven approach allows for personalized services and content recommendations, enhancing the overall user experience (Jayachristraya & Hemapriyaa, 2023). AI-driven data analytics can also help libraries monitor and analyse reference service usage patterns, user experience and performance metrics to improve services and resource utilization (Hasan et al., 2024).
5. Circulation: In the circulation section, AI can be used to handle new member registrations, membership renewals, process overdue fines and update to user information. By employing AI for these routine tasks, libraries can reduce administrative workload, enhance data accuracy, and provide a seamless membership experience for patrons (Ashikuzzaman, 2023). AI can also be used for automated checkouts, inventory management, queue management and user behaviour analysis in the circulation section (Hasan et al., 2024).
6. Acquisitions: In the acquisition section, AI can help streamline the acquisition process, making buying decisions more efficient. It can also be used to assist with vendor selection and negotiation by analysing vendor performance, buying history and market trends (Hasan et al., 2024). AI predictive analytics can help predict future resource needs by looking at usage patterns, circulation information and collection gaps, so that libraries can make smart decisions about what to get (Hasan et al., 2024).

Turning Artificial Intelligence ideas into actions in academic libraries (practical examples)

Globally, there are examples of academic libraries that have turned AI ideas into actions. One of such examples was reported in a 2023 publication by Huang, Cox and Cox. The research investigated the strategic plans of 25 top ranking universities in the United Kingdom (UK) and also in Mainland China on AI. Among the study's findings, it was revealed that 18 libraries in those universities have already introduced AI applications or offer AI services. Out of the 18 libraries 2 are in the UK, while 16 are in Mainland China. It was also revealed that 9 of the libraries provide intelligent virtual agents, enquiry robots or chatbot services (Huang et al., 2023). Another example could be found in the research work that was carried out by Owusu-Ansah, Amankwah, Yeboah, Amoako, Boateng and Nutsukpui (2024). The study explored the adoption of AI in three selected academic libraries in Ghana. Among the findings of the study, it was revealed that all the three academic libraries have adopted AI to a certain extent. It was also revealed that technical services are the strategic area of library operation where AI integration is being actively applied in the selected libraries. Similarly, Masinde, Mugambi and Wambiri (2024) examined the current landscape of AI adoption in Kenyan academic libraries. Findings of the study revealed that virtual assistants are the most widely adopted AI tools in the academic libraries. With 74% respondents acknowledging their availability in their libraries. Findings further revealed that robots were yet to find adoption in the academic libraries.

In Nigeria, it was reported in the Vanguard Newspaper (2020) that University of Lagos received donations of three robots from Platform Capital, a global investment firm. One of the robots was deployed to the library to shelve books, take temperature of users, take statistics of users that visit the library daily and so forth. Wagwu, Okpala, Oladokun and Ajani (2023) carried out an investigation on user experience with ChatGPT at the Federal University of Technology Ikot Abasi library. Findings of the study revealed that the library has integrated ChatGPT into its user-centred services. The AI tool is mainly used to provide assistance with resource discovery, to provide accurate and quick responses to user's queries and to offer research guidance (Wagwu et al., 2023). Similarly, at the University of Jos library, Nwokedi (2025) reported that ChatGPT is gradually being introduced into its user-centred services especially in the serials section.

Constraints to wide and rapid integration of Artificial Intelligence ideas in libraries

Oladokun, Owolabi, Aboyade, Wiche and Aboyade (2023) noted that academic libraries are slow in integrating AI into their operations. In the same vein, Orubebe, Oloniruha and Oladokun (2024) reported that there are various constraints that have hindered the widespread adoption and use of AI in academic libraries in both developed and developing nations. These constraints can be categorized into three. These are:

1. **Financial and infrastructure constraints**

   Inadequate funding: Many academic libraries particularly in developing countries like Nigeria face budget cuts that restrict their ability to invest in new technologies and skilled personnel. Thus**,** resource constraints produce uneven adoption that widens the digital divide between well-funded institutional libraries and others.

- **Limited ICT infrastructure**: Many academic libraries lack sufficient computers or stable networks to host or integrate modern AI systems. Moreover, the initial and ongoing costs of implementing AI, including hardware, software, and maintenance, can be prohibitive

2. Human resource constraints

- **Skills gap**: There is a need for staff with specialized skills to develop, implement, and maintain AI solutions in academic libraries, which can be difficult to find or develop. Without staff capable of evaluating models such as bias, hallucination and privacy, academic libraries may either avoid AI or deploy it unsafely (Shahzad, Khan, Iqbal, Ahmed, Javeed & Mohamed 2025).
- **Lack of training**: Librarians require training to adapt to new technologies, but access to effective training programs can be limited.
- **Resistance to change**: Some staff may be resistant to adopting new AI applications due to fear of job displacement or a lack of organizational support for change.

3. Ethical and technical constraint.

- **Potential violation of ethical codes:** AI can reproduce or amplify biases in training data, produce inaccurate or misleading outputs ("hallucinations"), or automate decisions without clear accountability. These conflict with libraries' commitments to equity, intellectual freedom, and accuracy. These issues can cause harm to patrons such as misinformation, marginalization, reputational damage, and violations of ethical codes.
- **Public perception:** Some patrons are wary of AI, fearing surveillance and data misuse, which requires libraries to engage in transparent communication to build trust.
- **User trust and acceptance**: Whenever there is an emerging technology such as AI, users usually express concern about privacy and transparency before accepting the technology.
- **Data privacy and security**: AI systems often require user data such as queries, circulation records, and/or reading history. At times the systems may require sending of metadata to third-party services. These can create privacy risks that conflict with libraries' core duty to protect patrons' privacy. These issues can result to loss of trust, legal risks (data protection laws), and ethical conflicts with librarianship values.
- **Technical complexity**: AI-based services can be complex to manage and may require more resources and expertise than are currently available to library staff (Afolayan 2025; Joel 2025; Matsieli & Mutula 2025; Panda, Sharma, Sati, & Kaur, 2024; Shahzad, Khan, Iqbal, Ahmed, Javeed & Mohamed 2025).

Conclusion

Just like other academic libraries in Africa and beyond, Nigerian academic libraries have evolved greatly in the course of time. In the present era which is the fourth revolution, AI is among the emerging technologies that are gradually shaping academic libraries. Thus, AI holds great potentials and benefits for academic libraries all over the world including Nigeria. However, for Nigerian academic libraries to turn these potentials or ideas into action, much needs to be done due to numerous constraints associated with the ideas. In order to surmount these constraints, it is imperative for the libraries to first start small by constituting AI committees; by carrying out users

and staff needs assessment, and by developing AI policies that would guide them. Afterwards, they can launch low-cost AI applications such as chatbots in their libraries.

Way forward

To successfully turn AI ideas into actions in Nigerian academic libraries. The above-mentioned constraints must be adequately addressed. Below are some suggestions or the way forward:

1. The academic libraries should carry out needs assessment for both library staff and users to ascertain their actual needs in terms of AI apps and areas of training.
2. They should inaugurate AI committees in the library that would map out strategies on how to turn AI ideas into actions.
3. The committee should development clear, concise and straightforward AI policies that would guide them and give them directions on how to launch, manage and maintain AI applications in their libraries.
4. With respect to funds and infrastructure, Nigerian academic libraries can solicit for funds by combining a blend of external grants, collaborations, low-cost open-source tools, internally generated incomes, and community partnerships. They can apply for grants from organizations like EIFL, Carnegie Corporation, IFLA, UNESCO, and Google Research Africa. They can also seek collaboration with telecom companies such as MTN and Globacom, or banks such as First bank and Zenith bank via Corporate Social Responsibility (CSR) programs to support digital infrastructure. Besides, they can invest in digital infrastructure by advocating for university management and government agencies (like TETFund) to support reliable internet connectivity, cloud computing infrastructure, and updated library management systems compatible with AI. The libraries can also share infrastructure through library consortia. Still, they can use open-source and affordable AI tools such as Koha ILS with AI plugins, TensorFlow, OpenAI APIs, or ChatGPT free tiers. They can also use Zotero's AI assistants for citation and information retrieval. This reduces licensing costs and allows customization for local contexts (Idemudia & Makinde; IFLA 2024; UNESCO 2025; UNESCO 2021).
5. As concerns AI skills, the academic libraries they can organize regular workshops and training sessions on AI literacy, data management, and digital tools. Even if it entails starting small (e.g., using free online resources). They can also partner with their parent institution's Computer Science or IT departments to conduct hands-on training for librarians. Furthermore, they can enroll librarians in online courses such as Coursera: *AI for Everyone*, dX: *Artificial Intelligence in Practice* and UNESCO's *AI and Digital Transformation in Education* courses. They can also encourage peer-to-peer training: a few tech-savvy staff can train others ("train-the-trainer model"). Afterwards, they can implement gradual and scalable AI projects by starting with small, low-cost AI applications such as AI-powered library chatbots, automated cataloguing systems, and predictive analytics for resource usage. The libraries should scale up once technical expertise and infrastructure improve (Idemudia & Makinde; IFLA 2024; UNESCO 2025; UNESCO 2021).
6. Finally, as concerns ethics, the libraries can develop clear AI ethics and governance policies that aligned with the Nigerian Data Protection Act (2023), UNESCO's Recommendation on

the Ethics of AI (2021), and Institutional ICT or research policies. Policies should cover data privacy, informed consent, algorithmic fairness, and responsible use of user data. The libraries should also ensure data privacy and security by protecting user data through secure data storage, encryption, and anonymization. Train staff on data protection principles and compliance with national and institutional privacy standards. In addition, they can promote transparency and accountability by explaining to patrons how AI systems make decisions (e.g., how chatbots or recommendation engines operate). They should also maintain human oversight of AI tools librarians should validate outputs, not depend entirely on algorithms. They can also create ethical awareness and staff training by organizing seminars and training on AI ethics, privacy, and responsible innovation (Idemudia & Makinde 2022; IFLA 2024; UNESCO 2025; UNESCO 2021).

References

Aabo, S. (2018). The role of libraries in society. *Journal of Library Administration, 58*(2), 139–141.

Afolayan, O. T. (2025). Drivers and impediments in the adoption of artificial intelligence by academic libraries in Nigeria. *Library Philosophy and Practice (e-journal)*, 8263. https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=15932&context=libphilprac

Ashikuzzaman, M. D. (2023). *Application of Artificial Intelligence in libraries: A comprehensive study on the integration and impact of Artificial Intelligence in library.* Application of AI in Libraries: A Comprehensive Study on the Integration and Impact of Artificial Intelligence in Library - Library & Information Science Education Network

Dixit, C., Dixit, K. L., Dixit, C. K., & Pandey, P. K. (2024). The role and evolution of libraries in the information age. *International Journal of Science, Engineering and Technology, 12*(4). https://www.ijset.in/wp-content/uploads/IJSET_V12_issue4_642.pdf

Hasan, N., Saifullah, M., & Hashmi, A.H. (2024). Application of artificial intelligence in libraries: Benefits and drawbacks. *Journal of Data Science, Informetrics and Citation Studies, 3*(2), 98-105. (66) Application of Artificial Intelligence in Libraries: Benefits and Drawbacks

High-level Expert Group on Artificial Intelligence. (2019). *A definition of Artificial Intelligence: Main capabilities and scientific disciplines. European Commission.* ai_hleg_ai_definition_final_DF06F793-EA01-3573-16D2ACD625E2BDB0_56341 (1).pdf

Huang, Y., Cox, A.M., & Cox, J. (2023). Artificial Intelligence in academic library strategy in the United Kingdom and the Mainland of China. *The Journal of Academic Librarianship, 49,* (6):1-11. Artificial Intelligence in academic library strategy in the United Kingdom and the Mainland of China

Idemudia, B. E., & Makinde, B. (2022). Artificial intelligence adoption in Nigerian academic libraries: Prospects and challenges. *Communicate Journal of Library and Information Science, 24*(2), 1–18. file:///C:/Users/DELL/Downloads/11-Ehinomhen__Makinde2.pdf

IFLA. (2024). *Developing a library strategic response to artificial intelligence.* https://www.ifla.org/g/ai/developing-a-library-strategic-response-to-artificial-intelligence/

Jayachristraya, S & Hemapriyaa, S. (2023). Transforming libraries: Applications of artificial intelligence in library services. *Gyankosh: The Journal of Library and information Management, 4*(1&2), 61-71. (62) TRANSFORMING LIBRARIES: APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN LIBRARY SERVICES

Jevons, H. S. (1931). The second industrial revolution. *The Economic Journal, 41*(161), 1–18. https://doi.org/10.2307/2224131

Joel, A. P. (2025). Prospect and challenges of artificial intelligence technologies in academic libraries in North Eastern Nigeria. *Global Science Research Journals, 12*(1), 1–7. https://www.globalscienceresearchjournals.org/articles/prospect-and-challenges-of-artificial-intelligence-technologies-in-academic-libraries-in-north-east-nigeria.pdf

Khaleed, M., Jebrel, A., & Shwehdy, D.M. (2024). Artificial intelligence in computer science. *International Journal of Electrical Engineering and Sustainability (IJEES), 2*(2), 1-21. file:///C:/Users/DELL/Downloads/ArtificialIntelligenceinComputerScienceIJEES.pdf

Kim, B. (2019). Artificial Intelligence and creating the first multidisciplinary Artificial Intelligence laboratory. *Library Technology Reports, 55*, 16. Artificial Intelligence in academic library strategy in the United Kingdom and the Mainland of China - ScienceDirect

Lor, P. J. (2012). The role of libraries in scholarly communication. *The Journal of Academic Librarianship, 38*(5), 296–302.

Manning, C. (2020). *Artificial Intelligence definitions. Stanford University Human-centered Artificial Intelligence.* AI-Definitions-HAI.pdf

Masinde, J.M., Mugambi, F., & Wambiri, D.M. (2024). Exploring the current landscape of Artificial Intelligence adoption in Kenyan academic libraries. *ICEGOV24: Proceedings of the 17th International conference on Theory and Practice of Electronic Governance*, 403-408. Exploring the Current Landscape of Artificial Intelligence Adoption in Kenyan Academic Libraries | Proceedings of the 17th International Conference on Theory and Practice of Electronic Governance

Matsieli, M., & Mutula, S. (2025). Generative AI and the information society: Ethical reflections from libraries. *Information, 16*(9), 771. https://doi.org/10.3390/info16090771

Mohajan, H. K. (2019). The first industrial revolution: Creation of a new global human era. *Journal of Social Sciences and Humanities, 5*(4), 377–389. file:///C:/Users/DELL/Downloads/70320308.pdf

Nwokedi, G.I. (2025). Integration of Artificial Intelligence in academic library operations: Perspectives of professionals in a Nigerian university library. [Manuscript in preparation].

Oladokun, B. D., Owolabi, A. K., Aboyade, M. A., Wiche, H. I., & Aboyade, W. A. (2023). Emergence of robotic technologies: Implications for Nigerian academic libraries. *Library Hi Tech News, 40*(6), 15-18.https://www.researchgate.net/publication/369480028_Emergence_of_robotic_technologies_implications_for_Nigerian_academic_libraries

Orubebe, E.D., Oloniruha, E.A., & Oladokun, B.D. (2024). Adoption and utilization of Artificial Intelligence in academic library: Challenges and opportunities in developed and developing nations. *International Journal of Knowledge Content Development & Technology.* (PDF) Adoption and Utilization of Artificial Intelligence in Academic Libraries: Challenges and Opportunities in Developed and Developing Nations

Owusu-Ansah, C.M., Amankwah, A; Yeboah, P; Amoako, K; Boateng, M; Nutsukpui, E. (2024). Artificial Intelligence (AI) in academic libraries in Ghana: A case study of three academic libraries. *International Journal of Knowledge Content Development & Technology.*42894.pdf

Panda, S., Sharma, V., Sati, P. P., & Kaur, N. (2024). *Ensuring ethical intelligence: Guiding the integration of AI in modern libraries.* In *Transforming libraries and education 5.0 with AI and Metaverse* (pp. 87–106). Integrity Education India. https://doi.org/10.5281/zenodo.13903781

Russell, S., & Norvig, P. (2020). *Artificial Intelligence: A modern approach.* (4th edition). Pearson.

Shahzad, K., Khan, S. A., Iqbal, A., Ahmed, S., Javeed, A. M. D., & Mohamed, O. (2025). Factors influencing the adoption of artificial intelligence in libraries: A systematic literature review. *Information Development, 41*(3), 592–614. https://doi.org/10.1177/02666669241313368

Smith, B. (2019). The third industrial revolution: Policymaking for the Internet. *Science and Technology Law Review, 3*. https://doi.org/10.7916/stlr.v3i0.3621

Sheikh, H., Prins, C., & Schrijvers, E. (2023). *Artificial Intelligence: Definition and background in Mission AI, Research for policy.* (PDF) Artificial Intelligence: Definition and Background

Sona, V., & Padhi, B. K. (2020). The evolution of libraries from scrolls to bytes. *International Journal of Early Childhood Special Education (INT-JECSE), 12*(1), 1–7. https://www.int-jecse.net/article/The+Evolution+of+Libraries%253A+From+Scrolls+to+Bytes_6722/?download=true&format=pdf

Sturges, P., & Neill, R. (2013). Libraries as guardians of cultural heritage. *Library & Information Science Research, 35*(2), 105–112.

The Editors of Encyclopaedia Britannica. (2025, September 29). *Industrial revolution. Encyclopedia Britannica.* https://www.britannica.com/event/Industrial-Revolution

The Strategic Foresight Initiative. (2013). *The third industrial revolution.* In *Envisioning 2030: US strategy for the coming technology revolution* (pp. 15–22). Atlantic Council. http://www.jstor.org/stable/resrep03584.8

Turner, P. (2024). *The second industrial revolution: From hierarchy to M Form.* In *The making of the modern organisation.* Palgrave Macmillan. https://doi.org/10.1007/978-3-031-70047-7_4

UNESCO. (2021). *Recommendation on the ethics of artificial intelligence.* Paris: UNESCO. https://www.unesco.org/en/articles/recommendation-ethics-artificial-intelligence

UNESCO. (2025). *AI and the future of education: Disruptions, dilemmas and directions.* https://www.unesco.org/en/articles/ai-and-future-education-disruptions-dilemmas-and-directions

Vanguard Newspaper. (2020, June 29). COVID-19: Unilag gets robots for temperature, blood pressure checks, others. https://www.vanguardngr.com/2020/06/covid-19-unilag-gets-robots-for-temperature-blood-pressure-checks-others/

Wagwu, V., Okpala, A.E., Oladokun, B.D., & Ajani, Y.A. (2023). User experience with ChatGPT in a Nigerian university library: Exploring user's satisfaction and feedback. *University of Ibadan – Journal of Library and Information Science UI (JLIS)* 6(2):214-226. file:///C:/Users/DELL/Downloads/_JOURNAL+of+Library223-24-36-1.pdf

World Economic Forum. (2025). *The fourth industrial revolution: What it means, how to respond.* https://www.weforum.org/stories/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/