International Journal of Innovative Information Systems & Technology Research 14(3):281-293, July-Sept, 2026

© SEAHI PUBLICATIONS, 2026 www.seahipublications.org ISSN: 2467-8562

DOI:10.5281/zenodo.22239921

Artificial Intelligence Adoption as a Catalyst for Revitalizing University Libraries and Enhancing Service Delivery in Nigeria

OMENE, Yemi Blessing

Admiralty University of Nigeria, Delta State, Nigeria

ABSTRACT

The rapid advancement of Artificial Intelligence (AI) is transforming information services and creating opportunities for revitalizing university libraries in the digital age. This article examines Artificial Intelligence Adoption as a Catalyst for Revitalizing University Libraries and Enhancing Service Delivery in Nigeria. The study adopts a desk research strategy, based on a systematic review and synthesis of secondary sources, including scholarly journal articles, books, conference proceedings, institutional publications, policy documents and relevant reports on AI, academic libraries and library service delivery. The review reveals that AI technologies have significant potential to transform traditional library operations through intelligent information retrieval, automated cataloguing and classification, virtual reference services, personalized information services, predictive analytics, digital resource management and automation of routine tasks. Evidence from Nigerian academic libraries indicates that AI adoption remains at an emerging stage but offers substantial opportunities for improving operational efficiency, accessibility, accuracy, user experience and service quality. However, inadequate technological infrastructure, unstable electricity supply, insufficient funding, limited AI competencies among librarians, weak institutional policies, data privacy and security concerns, ethical issues, resistance to technological change and fears of job displacement constitute major barriers to effective adoption. The article argues that AI should complement rather than replace librarians by augmenting professional capabilities and enabling them to focus on higher-value, user-centred and knowledge-intensive services. The study concludes that strategic and responsible AI adoption, supported by adequate infrastructure, sustainable funding, staff training, ethical safeguards and institutional collaboration, can revitalize Nigerian university libraries and reposition them as innovative, technology-driven and user-centred knowledge hubs capable of delivering efficient, accessible, responsive and sustainable library services.

Keywords: Artificial Intelligence; AI Adoption; University Libraries; Library Revitalization; Service Delivery; Digital Transformation; Librarians; Nigeria.

INTRODUCTION

University libraries occupy a strategic position in teaching, learning, research and knowledge development within higher education institutions. Traditionally, they have served as repositories of scholarly information and provided services such as collection development, cataloguing and classification, circulation, reference services, information literacy, bibliographic services and access to electronic resources. However, rapid changes in the information environment, characterized by the increasing volume, variety and velocity of digital information, have created new demands for university libraries to transform their traditional operations and service delivery. Contemporary library users

increasingly expect immediate, accurate, personalized, remote and technology-enabled access to information. Consequently, university libraries must embrace emerging technologies to remain relevant and responsive to the changing needs of students, lecturers, researchers and other academic stakeholders.

Artificial Intelligence (AI) has emerged as a significant technology with the capacity to transform information and knowledge services. AI encompasses computational systems capable of performing tasks associated with human intelligence, including learning, reasoning, language processing, pattern recognition, prediction and decision-making. The emergence of generative AI has further expanded opportunities for intelligent information services. UNESCO (2023) emphasizes that generative AI has important implications for education and research but requires human agency, ethical safeguards, data protection and institutional capacity for responsible adoption. Within library and information science, AI is increasingly associated with intelligent information retrieval, automated cataloguing and classification, virtual reference services, natural-language interfaces, personalized recommendations, user-behaviour analysis, preservation and research support. Adamu et al. (2025) note that AI technologies can be applied to acquisition, cataloguing, classification and indexing, with the potential to improve the efficiency, accuracy and effectiveness of library services.

The growing significance of AI presents an opportunity to move university libraries beyond conventional service models toward intelligent, flexible and user-centred information environments. Its strategic adoption can serve as a catalyst for library revitalization, understood as the renewal and modernization of library facilities, technologies, human resources, processes and services in response to changing information needs. AI can facilitate workflow redesign, improve information access, reduce repetitive tasks and enhance user engagement while allowing librarians to devote greater attention to complex professional and research-support activities.

The Nigerian university library environment presents a distinctive context for AI adoption. Although Nigerian academic libraries have increasingly incorporated information and communication technologies, the transition from conventional digital systems to intelligent and AI-driven systems remains at an emerging stage. Odigie (2024) found that librarians in university libraries in North-Central Nigeria demonstrated considerable awareness of AI tools such as ChatGPT and Gemini, but their use was largely concentrated on personal activities rather than professional library service delivery. This indicates a gap between awareness of AI and its systematic institutional application in library operations and services.

Similarly, Ugbor et al. (2024) identify AI adoption in Nigerian academic libraries as an emerging trend with potential to improve services and operational efficiency. However, inadequate infrastructure, funding constraints, shortage of trained personnel, resistance to change and insufficient user education remain significant challenges. These challenges demonstrate that the availability of AI technologies alone does not guarantee effective service transformation. Successful adoption requires an enabling institutional environment characterized by appropriate infrastructure, skilled personnel, sustainable funding, supportive policies and organizational readiness. Igbo et al. (2025) further identify policy frameworks, digital infrastructure, human-capital development, technical expertise, appropriate data and data security and privacy mechanisms as important requirements for effective AI implementation. High implementation costs, inadequate technical skills, fear of job displacement, insufficient infrastructure and unreliable electricity supply also constitute significant barriers.

Librarians' awareness, acceptance and readiness are also important to successful AI adoption. Orubebe et al. (2025), in their study of librarians in academic libraries in Rivers State, reported that librarians possessed basic AI knowledge and recognized its potential applications in areas such as procurement, prediction of search trends and data management. This suggests that librarians' perceptions, competencies and readiness can influence the extent to which AI becomes integrated into professional library services. Therefore, AI adoption requires not only technological investment but also continuous professional development and institutional support.

The potential contribution of AI to effective library service delivery is particularly important because contemporary users increasingly demand services that are fast, accessible, personalized and available beyond traditional opening hours. AI-enabled virtual reference systems, intelligent search tools and

conversational agents can provide immediate assistance in locating and interpreting information. Automated systems can also reduce repetitive administrative tasks, allowing librarians to concentrate on information literacy, research consultation, scholarly communication and knowledge management. Consequently, AI should be regarded primarily as a tool for augmenting librarians' professional competencies rather than replacing them.

Recent Nigerian literature supports this transformative potential. Jibga (2025) reports that AI applications such as chatbots, RFID, intelligent OPAC systems and predictive analytics are gradually being introduced into Nigerian academic libraries. These technologies can support virtual reference services, self-checkout, cataloguing, indexing and analysis of user behaviour. Nevertheless, implementation remains limited and fragmented, with data privacy, algorithmic bias and possible job displacement requiring greater attention. The broader African context similarly indicates the need for strategic rather than fragmented adoption. Nkomo and Matli (2025) emphasize the importance of examining how universities are integrating AI technologies into library services, particularly within an environment characterized by financial, infrastructural and human-capacity limitations.

The adoption of AI also raises important ethical and professional concerns. University libraries have a responsibility to protect users' privacy, intellectual freedom and equitable access to information. AI systems may create risks relating to inaccurate information, algorithmic bias, unauthorized use of personal data, intellectual property, surveillance and excessive dependence on automated systems. UNESCO (2023) therefore advocates a human-centred approach emphasizing ethical validation, data protection, equity, human agency and institutional capacity. For university libraries, this requires clear policies, professional guidelines, staff training and responsible governance mechanisms.

Library revitalization through AI therefore extends beyond acquiring technological tools. It involves a holistic transformation of library infrastructure, operations, professional competencies, policies, service models and relationships with users. The goal is to create libraries that combine technological innovation with professional expertise, ethical responsibility and user-centred services. Effective revitalization requires university library management to identify areas where AI can create meaningful value while preserving the essential human and professional dimensions of librarianship.

Despite the growing literature on AI and libraries, there remains a need for an integrated examination of AI as a catalyst for the broader revitalization of Nigerian university libraries. Existing studies frequently focus on individual issues such as awareness, adoption, readiness, challenges or specific AI applications. There is therefore a need to synthesize available evidence on how AI adoption can simultaneously contribute to the modernization of library operations and the enhancement of service delivery. A desk-research approach provides an appropriate basis for such synthesis because it enables the examination of existing scholarly studies, institutional reports, policy documents and other secondary sources.

Against this background, this article examines Artificial Intelligence Adoption as a Catalyst for Revitalizing University Libraries and Enhancing Service Delivery in Nigeria. It explores the potential applications of AI in university libraries, examines its contribution to library revitalization and service delivery, identifies major barriers to adoption and discusses strategies for promoting responsible, sustainable and human-centred AI integration. The article argues that, when supported by adequate infrastructure, funding, staff capacity development, appropriate policies, ethical safeguards and institutional commitment, AI can become a significant catalyst for transforming Nigerian university libraries into innovative, responsive, accessible and sustainable knowledge centres.

Conceptual Clarifications

Concept of Artificial Intelligence

Artificial Intelligence (AI) refers to the capability of computer systems and digital technologies to perform tasks that ordinarily require human intelligence, such as learning, reasoning, problem-solving, decision-making, language understanding, pattern recognition and information processing. AI systems are designed to analyse large volumes of data, identify patterns, generate responses and perform specific tasks with varying degrees of autonomy. The rapid development of machine learning, natural language

processing, deep learning and generative AI has significantly expanded the application of AI across education, research, business, healthcare and library and information services.

In the context of university libraries, Artificial Intelligence can be understood as the application of intelligent computational technologies to automate, support and improve library operations and services. AI can assist with information retrieval, automated cataloguing and classification, reference services, recommendation systems, user-support chatbots, research assistance, digital resource management and analysis of users' information needs. These applications have the potential to reduce repetitive workloads, improve the speed and accuracy of information services and provide users with more personalized and responsive services.

The emergence of generative Artificial Intelligence, particularly conversational systems capable of producing text and other forms of content, has created additional possibilities for university libraries. Generative AI can support librarians and researchers in activities such as literature discovery, summarization, question answering, research assistance and information-literacy instruction. UNESCO (2023), however, emphasizes that the use of generative AI in education and research should be guided by human agency, ethical considerations, privacy protection, inclusiveness and responsible institutional governance.

Recent studies in the Nigerian library environment similarly indicate that AI has considerable potential to transform traditional library operations and improve service delivery. Adamu et al. (2025) identify applications of AI in areas such as acquisition, cataloguing, classification and indexing, while Igbo et al. (2025) emphasize the importance of infrastructure, human-capital development, technical expertise, data security and appropriate institutional policies for successful AI adoption in academic libraries.

Therefore, Artificial Intelligence should not be perceived merely as a technological replacement for librarians. Rather, it represents an enabling and augmentative technology that can complement librarians' professional expertise, automate routine activities and allow library professionals to concentrate on higher-level services such as research support, information literacy, scholarly communication, knowledge management and personalized user assistance. In this sense, AI provides an important technological foundation for the revitalization of university libraries and the enhancement of effective service delivery in Nigeria.

Concept of AI Adoption

Artificial Intelligence (AI) adoption refers to the process through which individuals, organizations or institutions accept, integrate and utilize AI technologies in their activities, operations and service delivery. It involves more than simply acquiring AI tools; it encompasses awareness, acceptance, organizational preparedness, infrastructure development, staff competencies, implementation and continuous utilization of AI systems. In the context of university libraries, AI adoption therefore describes the extent to which libraries integrate AI-powered technologies into their operations and services to improve efficiency, accessibility, accuracy and user experience.

AI adoption in university libraries involves the application of intelligent technologies to functions such as information retrieval, cataloguing, classification, indexing, reference services, collection management, user-support services and research assistance. Adamu et al. (2025) indicate that AI can be applied to acquisition, cataloguing, classification and indexing in Nigerian university libraries, thereby providing opportunities for more efficient and effective service delivery. Similarly, Jibga (2025) identifies chatbots, intelligent OPAC systems, RFID and predictive analytics as emerging AI applications capable of supporting reference services, information retrieval, self-checkout and analysis of user behaviour in academic libraries.

The concept of AI adoption also includes the readiness and capacity of librarians to use AI effectively. Technology cannot transform library services unless librarians possess the necessary digital and AI competencies to operate, evaluate and ethically manage AI-enabled systems. Orubebe et al. (2025) found that librarians in academic institutions in Rivers State demonstrated basic knowledge of AI and recognized its potential applications in areas such as procurement, search-trend prediction and data

management. This suggests that awareness and professional preparedness are important foundations for effective AI adoption.

Furthermore, successful AI adoption requires an enabling institutional environment. Igbo et al. (2025) identify digital infrastructure, human-capital development, technical expertise, policy frameworks, data availability, security and privacy as important requirements for AI adoption in Nigerian academic libraries. Consequently, AI adoption should be understood as an organizational transformation process involving technology, people, infrastructure, policies and management support rather than as the mere installation of AI applications.

Within the context of this study, AI adoption is conceptualized as the strategic integration and sustained utilization of artificial intelligence technologies, supported by appropriate infrastructure, skilled librarians, institutional policies and ethical safeguards, to modernize university library operations and enhance service delivery. Thus, effective AI adoption can serve as an important pathway for revitalizing Nigerian university libraries and repositioning them as innovative, responsive, accessible and user-centred knowledge centres.

Concept of University Library Revitalization

University library revitalization refers to the systematic process of renewing, modernizing and transforming university libraries, their resources, infrastructure, operations and services to meet the changing information, teaching, learning and research needs of users. It goes beyond physical renovation to include technological innovation, staff capacity development, modernization of library operations and the introduction of user-centred services. In the contemporary digital environment, revitalization is essential for repositioning university libraries from traditional repositories of information to dynamic, technology-driven knowledge and research centres.

The increasing application of Artificial Intelligence (AI) provides an important pathway for such transformation. Recent studies show that AI can support cataloguing, classification, indexing, information retrieval, reference services, personalized information delivery and user-behaviour analysis, thereby improving the efficiency and accessibility of library services (Jibga, 2025; Ogungbenro et al., 2025). Thus, library revitalization increasingly involves the integration of intelligent technologies capable of automating routine activities while enabling librarians to concentrate on more complex and value-added professional services.

In Nigeria, the need for university library revitalization is particularly significant because libraries face challenges relating to inadequate infrastructure, funding limitations, unreliable electricity, technological deficiencies and shortages of relevant digital competencies. Igbo et al. (2025) emphasize that effective AI-enabled transformation requires adequate digital infrastructure, appropriate policy frameworks, human-capital development, technical expertise and data security. ([Niger Biblios][2]) Similarly, Ugbor et al. (2024) identify trained personnel, funding and technical infrastructure as important conditions for successful AI adoption in Nigerian academic libraries.

Revitalization also requires transforming the role of librarians. Achugbue (2025) emphasizes the need for librarians in South-South Nigerian universities to develop AI-related competencies to effectively support emerging services such as automated cataloguing, digital resource management, AI-driven user assistance and predictive analytics. Consequently, revitalized university libraries should promote human–AI collaboration, rather than regard AI as a replacement for professional librarians.

Therefore, university library revitalization can be conceptualized as a comprehensive transformation of library infrastructure, technology, human resources, operations and services aimed at creating innovative, accessible, efficient and user-centred knowledge centres. Within the context of this study, AI serves as a significant catalyst for revitalization because its strategic adoption can modernize library operations, improve information access, enhance user experience and ultimately strengthen effective service delivery in Nigerian university libraries.

Concept of Effective Library Service Delivery

Effective library service delivery refers to the ability of a university library to provide timely, accurate, accessible, relevant, efficient and user-centred information services that adequately satisfy the academic, teaching, learning and research needs of its users. It encompasses the processes through which library resources and professional services are made available to students, lecturers, researchers and other members of the university community. Effective service delivery is therefore not measured merely by the quantity of resources available but by the extent to which users can conveniently access and derive value from those resources and services.

In the contemporary university environment, effective library service delivery includes traditional services such as circulation, reference, current awareness, user education and information literacy, as well as technology-enabled services such as electronic resource access, digital libraries, online reference assistance, remote information services and intelligent information retrieval. Adewara et al. (2024) observed that Nigerian university libraries are increasingly integrating digital technologies with conventional services to broaden information provision, although service quality still requires further improvement.

An important dimension of effective service delivery is user satisfaction. Bello and Bankole (2024) found that undergraduate users of a Nigerian university library had high expectations concerning service quality, while perceived actual performance was comparatively lower. They consequently emphasized the need for libraries to improve the efficiency and quality of their services to meet users' expectations. Effective service delivery therefore requires libraries to continually assess users' needs and improve their services in response to changing expectations.

The emergence of Artificial Intelligence has created new opportunities for enhancing effective library service delivery. AI can facilitate automated cataloguing and classification, intelligent information retrieval, virtual reference services, chatbots, personalized recommendations and analysis of user information behaviour. Adamu et al. (2025) note that AI can be applied to several university library operations, including acquisition, cataloguing, classification and indexing, with the potential to improve efficiency, accuracy and effectiveness. Similarly, Jibga (2025) reports that AI applications such as chatbots, intelligent OPACs, RFID and predictive analytics can support reference services, self-checkout, cataloguing, indexing and user-behaviour analysis in Nigerian academic libraries.

Effective library service delivery can therefore be conceptualized in terms of accessibility, timeliness, accuracy, relevance, responsiveness, efficiency, user satisfaction and technological innovation. In the context of this study, AI adoption is viewed as an important mechanism for improving these dimensions by reducing repetitive workloads, accelerating information provision and enabling more personalized and responsive services. However, achieving these benefits requires adequate infrastructure, funding, skilled personnel and appropriate institutional policies. Thus, effective library service delivery in Nigerian universities increasingly depends on the library's capacity to combine professional librarianship with appropriate digital and AI-enabled technologies to meet the evolving information needs of its users.

Importance of Artificial Intelligence Adoption in University Libraries

The adoption of Artificial Intelligence (AI) in university libraries has become increasingly important because of the changing nature of information resources, users' expectations and the growing demand for faster, more accessible and personalized library services. AI provides university libraries with opportunities to transform traditional operations, improve professional efficiency and reposition themselves as innovative knowledge and research centres. Recent literature indicates that AI can support a wide range of library functions, including information retrieval, cataloguing, classification, reference services, collection management and research support (Adamu et al., 2025; Jibga, 2025).

One major importance of AI adoption is automation of routine library operations. AI can assist with repetitive activities such as cataloguing, classification, indexing, circulation management and basic reference enquiries. This reduces the amount of time librarians spend on routine tasks and enables them to concentrate on more complex professional activities, including research consultation, information literacy

and scholarly communication. Ogungbenro et al. (2025) note that AI has considerable potential to transform cataloguing and information-access processes in Nigerian academic libraries.

AI adoption is also important for improving information retrieval and access. Intelligent search systems can process natural-language queries, identify relevant information and provide users with more efficient pathways to scholarly resources. This is particularly valuable in university libraries where students and researchers must navigate increasingly large volumes of electronic books, journals, databases and institutional repositories. AI-powered tools can therefore reduce the time and effort required to locate relevant information.

Another important benefit is enhanced reference and research services. AI-powered chatbots and virtual reference systems can provide users with immediate responses to routine questions and guide them towards appropriate information resources. Jibga (2025) identifies chatbots, intelligent OPAC systems and predictive analytics among AI applications capable of supporting reference services, information retrieval and user-behaviour analysis in Nigerian academic libraries.

AI can further promote personalized library services by analysing users' information needs and patterns of resource use. Recommendation systems, for example, can suggest relevant books, journal articles, databases and other resources based on users' interests or previous searches. Such personalization can improve user experience, increase engagement with library resources and strengthen user satisfaction.

The adoption of AI is equally significant for improving operational efficiency and service quality. AI systems can process large quantities of information rapidly and consistently, potentially improving the speed, accuracy and responsiveness of library services. Adamu et al. (2025) observe that AI applications across university library operations can contribute to more effective service delivery. This is particularly relevant to Nigerian university libraries seeking to improve services despite limitations in human and financial resources.

Furthermore, AI adoption can contribute to the revitalization and modernization of university libraries. Rather than remaining predominantly physical repositories, libraries can evolve into smart, digitally enabled and user-centred knowledge centres. Igbo et al. (2025) emphasize that AI adoption requires infrastructure, technical expertise, human-capital development, appropriate policies and data-security measures, indicating that successful AI implementation can also stimulate broader institutional investment in library modernization.

Finally, AI adoption is important for strengthening librarians' professional roles. AI should not necessarily replace librarians; rather, it can augment their capabilities by handling repetitive tasks and providing analytical support. Librarians can consequently devote more attention to research support, digital literacy, knowledge management, user education and other intellectually demanding services.

In summary, Artificial Intelligence adoption is important to university libraries because it promotes automation, efficient information retrieval, personalized services, improved reference and research support, operational efficiency, user satisfaction and institutional modernization. For Nigerian university libraries, strategic and responsible AI adoption can serve as an important pathway toward revitalizing library services and meeting the increasingly sophisticated information needs of the university community.

Relationship Between AI Adoption, Library Revitalization and Service Delivery

The relationship between Artificial Intelligence (AI) adoption, university library revitalization and effective service delivery is complementary and mutually reinforcing. AI adoption provides the technological foundation for transforming traditional university libraries, while library revitalization creates the institutional environment necessary for applying AI effectively. Improved service delivery is, in turn, one of the major outcomes expected from such transformation. Thus, AI adoption can be viewed as a catalyst that connects technological innovation with library modernization and improved user-centred services.

AI adoption contributes to library revitalization by introducing intelligent technologies into library operations and services. These technologies can support automated cataloguing and classification,

information retrieval, digital resource management, virtual reference services, chatbots, predictive analytics and personalized information services. Recent studies in Nigeria indicate that AI has the potential to modernize library operations and reposition academic libraries as innovative knowledge centres (Jibga, 2025; Oton & Kolawole, 2025).

The relationship is also evident in operational efficiency. Traditional library activities often involve repetitive tasks that consume considerable staff time. AI can automate or support some of these activities, allowing librarians to redirect their attention toward higher-level professional responsibilities such as research support, information literacy, scholarly communication and user consultation. Adamu et al. (2025) report that AI applications can contribute to efficiency, accuracy and effectiveness in university library services in Nigeria.

Furthermore, AI adoption can strengthen service delivery by improving the speed, accessibility, relevance and personalization of information services. AI-powered systems can respond to routine enquiries, assist users in discovering relevant information and provide support beyond conventional library opening hours. Oton and Kolawole (2025) identify information retrieval, user services, collection development, cataloguing and classification among the areas in which AI can transform Nigerian library services.

The relationship can therefore be understood as a three-stage transformation: AI adoption → library revitalization → enhanced service delivery. AI adoption introduces new technological capabilities; these capabilities stimulate changes in library infrastructure, operations, staff competencies and service models; and the resulting transformation can improve the quality and effectiveness of services provided to students, lecturers and researchers. Ogungbenro et al. (2025) similarly observe that AI can improve cataloguing and access to information while positioning academic libraries as important knowledge hubs.

However, the relationship is not automatic. The extent to which AI contributes to library revitalization and service delivery depends on adequate digital infrastructure, funding, staff competencies, institutional policies, data availability and privacy safeguards. Igbo et al. (2025) identify policy frameworks, digital infrastructure, human-capital development, technical expertise and data security as important requirements for AI adoption in Nigerian academic libraries. (Odigie (2024) also found that although librarians demonstrated awareness of AI tools, their use was still largely for personal rather than professional library service delivery, indicating a gap between AI awareness and institutional application.

Consequently, AI adoption should not be regarded as a replacement for librarians but as an instrument for augmenting professional expertise and revitalizing library services. When strategically implemented, AI can modernize library operations, enhance librarians' capabilities, improve access to information and increase user satisfaction. Therefore, the relationship among AI adoption, library revitalization and service delivery is fundamentally one of technology-enabled transformation, in which responsible AI adoption provides the impetus for modernizing university libraries and enhancing their capacity to deliver efficient, accessible, responsive and user-centred services in Nigeria.

Review of Existing Literature

The adoption of Artificial Intelligence (AI) in university libraries has attracted increasing scholarly attention because of its potential to transform traditional library operations, revitalize library services and improve the quality of information delivery. The literature reviewed for this study indicates that AI is gradually moving from a theoretical concept to a practical tool for information management, although its adoption remains uneven, particularly within developing-country contexts such as Nigeria. Recent studies have examined AI applications, librarians' readiness, benefits, implementation requirements and challenges associated with AI-enabled library services.

Nkomo and Matli (2025) conducted an integrative systematic review of literature published between 2020 and 2024 on AI adoption in university libraries across Africa. Their review of 13 studies found that AI applications include virtual assistants, improved information-resource discovery, efficient collection management and expanded accessibility to information. However, the authors identified inadequate awareness, financial constraints, ethical concerns, user acceptance and organizational resistance as

significant barriers. They concluded that AI has transformative potential for African university libraries but requires an integrated framework for successful implementation.

Similarly, Idhalama and Nwachukwu (2025) reviewed the application of AI and machine-learning technologies in African library services. Their structured literature review established that AI and machine learning are being applied in several areas of library operations and services, with potential benefits including automation, improved information access and enhanced user experiences. However, the review also identified implementation challenges that require institutional and technological responses. The study is significant because it demonstrates that AI adoption is not limited to a single library function but has implications for the broader transformation of library services across Africa.

In the Nigerian context, Igbo et al. (2025) examined the requirements and challenges associated with adopting AI in academic library services. Their literature-based study identified policy frameworks, digital infrastructure, human-capital development, technical expertise, data generation and data security/privacy as essential requirements for successful AI implementation. The authors' findings suggest that AI adoption cannot be achieved simply by acquiring AI tools; rather, universities must create an enabling technological, organizational and human-resource environment.

Jibga (2025) examined the current state of AI adoption in Nigerian academic libraries, focusing on AI tools, integration, challenges and ethical implications. The study identified chatbots, RFID, intelligent OPAC systems and predictive analytics as emerging applications. These technologies can support virtual reference services, self-checkout, cataloguing, indexing and analysis of user behaviour. However, the study observed that AI implementation in Nigerian academic libraries remains limited and fragmented because of financial constraints, inadequate infrastructure and insufficient technical expertise. Ethical issues relating to data privacy, algorithmic bias and possible job displacement were also highlighted.

Further evidence is provided by Adamu et al. (2025), who investigated the application and use of AI for effective library service delivery in Nigerian federal university libraries. The study focused on how and in which areas AI is being applied in university libraries. Its findings reinforce the growing recognition that AI can contribute to efficiency, accuracy and effectiveness in library operations and services. This supports the argument that AI adoption can become an important mechanism for enhancing service delivery when appropriately integrated into library operations.

Ogungbenro et al. (2025) specifically examined the impact of AI on cataloguing and information access in Nigerian academic libraries. Their findings indicate that AI can transform cataloguing processes, optimize the management of large information resources, improve search capabilities and create more personalized user experiences. They identify technologies such as machine learning, natural language processing and robotic process automation as particularly relevant to library operations. The authors nevertheless emphasize the need for staff training, infrastructure investment, user engagement, ethical considerations and institutional collaboration.

The issue of librarians' readiness is another important theme in the literature. Orubebe et al. (2025), in a study of librarians in academic institutions in Rivers State, Nigeria, found that most respondents possessed basic knowledge of AI and recognized its potential to improve library efficiency, including procurement, prediction of search trends and data management. Similarly, recent research examining librarians' awareness, acceptability and application of AI in Nigerian academic research libraries indicates that awareness and acceptance are important dimensions of AI implementation. These findings suggest that successful library revitalization depends not only on technological availability but also on librarians' willingness and capacity to use AI effectively.

Oton and Kolawole (2025) further argue that the introduction of AI into Nigerian library services can transform important areas such as information retrieval, user services, collection development, cataloguing, classification and general library administration. They note that AI has the potential to streamline processes, personalize user experiences and improve access to information, although significant implementation obstacles remain. This reinforces the view that AI adoption can contribute to the broader revitalization of university libraries by transforming both internal operations and user-facing services.

The literature also demonstrates that AI adoption is not without risks. Across the reviewed studies, recurring challenges include inadequate funding, poor technological infrastructure, limited technical competencies, unreliable electricity, inadequate institutional policies, data privacy and security concerns, ethical issues, algorithmic bias, resistance to change and fears of job displacement. Nkomo and Matli (2025) similarly found that financial constraints, inadequate awareness and ethical concerns constitute significant barriers to AI implementation in African university libraries.

Synthesis of the Review

The reviewed literature reveals four major conclusions. First, AI has significant potential to revitalize university libraries by automating routine activities, modernizing information management and introducing intelligent services. Second, AI can enhance service delivery through improved information retrieval, virtual reference assistance, personalized services, faster processing and expanded access to library resources. Third, successful adoption depends on institutional readiness, including infrastructure, funding, policies, skilled librarians, data governance and management support. Fourth, there remains a significant gap between awareness of AI and its systematic institutional application in Nigerian university libraries.

Although recent studies have examined AI awareness, applications, readiness and challenges, relatively limited attention has been given to the integrated relationship between AI adoption, library revitalization and effective service delivery in Nigerian university libraries. Much of the existing literature addresses individual AI applications or adoption challenges rather than examining AI as a comprehensive catalyst for transforming university libraries. This gap provides justification for the present desk-research article, which synthesizes existing evidence to establish how strategic and responsible AI adoption can contribute to the revitalization of university libraries and the enhancement of service delivery in Nigeria.

Challenges of AI Adoption in Nigerian University Libraries

Despite the considerable potential of Artificial Intelligence (AI) to transform university libraries and improve service delivery, its adoption in Nigerian university libraries is confronted by several technological, financial, human, institutional and ethical challenges. Recent literature indicates that the successful integration of AI requires more than the availability of AI applications; it depends on the existence of adequate infrastructure, skilled personnel, sustainable funding, institutional policies and responsible governance (Igbo et al., 2025; Nkomo & Matli, 2025).

One of the major challenges is inadequate technological infrastructure. Effective AI applications require reliable internet connectivity, appropriate hardware, digital library platforms, adequate storage capacity and modern information-management systems. Many university libraries in Nigeria still operate with inadequate or outdated technological facilities, making it difficult to implement sophisticated AI applications. Nkomo and Matli (2025) identify infrastructural limitations as one of the major obstacles to AI adoption in African university libraries.

Closely related to infrastructure is inadequate and unsustainable funding. AI implementation requires considerable financial investment in hardware, software, internet services, system maintenance, staff training and technical support. Nigerian university libraries that already face financial constraints may find it difficult to allocate sufficient resources to AI-based transformation. Igbo et al. (2025) identify financial resources and institutional investment as important requirements for sustainable AI adoption in Nigerian academic libraries.

Another significant challenge is inadequate AI knowledge and technical competencies among librarians. The effective use of AI requires librarians to possess competencies in digital technologies, data management, prompt formulation, AI-assisted information retrieval, data privacy and ethical AI use. Although some Nigerian librarians demonstrate awareness of AI, awareness does not necessarily translate into effective professional application. Odigie (2024) found evidence of a gap between librarians' awareness of AI tools and their use for professional library service delivery.

Unreliable electricity supply and internet connectivity also constitute serious barriers. AI-driven library services depend on continuous access to electricity and stable internet networks. Interruptions can affect digital databases, cloud-based services, online reference systems and other AI-enabled applications, thereby reducing their reliability and sustainability.

Furthermore, institutional resistance and fear of technological change can slow AI adoption. Some librarians may perceive AI as a threat to their professional roles, particularly where automation is associated with possible job displacement. Jibga (2025) identifies resistance, inadequate technical expertise and concerns about job displacement among the issues confronting AI adoption in Nigerian academic libraries. Effective change management and continuous professional development are therefore necessary to promote human-AI collaboration rather than competition.

Data privacy, security and ethical concerns constitute another important challenge. AI systems may process substantial amounts of user information, including search histories, borrowing records and personal data. Improper handling of such information may expose library users to privacy and security risks. In addition, algorithmic bias, inaccurate AI-generated information, intellectual-property concerns and questions surrounding accountability require careful institutional attention. Igbo et al. (2025) consequently emphasize data security, privacy and appropriate policy frameworks as essential components of AI adoption.

Finally, the absence of comprehensive institutional AI policies and implementation frameworks remains a major challenge. Without clear guidelines, libraries may adopt AI technologies in an uncoordinated manner, creating inconsistencies in data management, ethical practice, staff responsibilities and service evaluation. Nkomo and Matli (2025) emphasize the importance of organizational readiness and appropriate frameworks for sustainable AI adoption in African university libraries.

In summary, the major challenges of AI adoption in Nigerian university libraries include inadequate infrastructure, insufficient funding, unreliable electricity and internet connectivity, limited staff competencies, resistance to change, fear of job displacement, privacy and security concerns, ethical issues, and inadequate institutional policies. Addressing these challenges requires coordinated efforts by university management, librarians, government agencies and professional bodies to provide sustainable funding, infrastructure, training, policy support and ethical governance. Such measures are essential if AI is to fulfil its potential as a catalyst for revitalizing Nigerian university libraries and enhancing effective service delivery.

CONCLUSION

Artificial Intelligence (AI) is increasingly becoming a significant instrument for transforming university libraries and improving the delivery of information services. The desk review indicates that AI has considerable potential to revitalize Nigerian university libraries through the automation of routine operations, improved information retrieval, personalized services, virtual reference assistance, enhanced research support and more efficient management of library resources. Its adoption can reposition university libraries from traditional information repositories to dynamic, innovative and technology-driven knowledge centres.

However, the review also shows that the benefits of AI cannot be achieved through technology acquisition alone. Inadequate infrastructure, insufficient funding, unreliable electricity and internet connectivity, limited AI competencies, ethical concerns, data privacy issues and inadequate institutional policies remain significant barriers to successful adoption. Consequently, AI implementation requires strategic planning, institutional commitment and continuous investment in both technology and human resources.

The study therefore concludes that AI should be viewed as a catalyst for, rather than a substitute for, professional librarianship. When supported by adequate infrastructure, sustainable funding, appropriate policies, continuous staff development and responsible ethical practices, AI can strengthen librarians' professional capabilities and significantly improve the accessibility, efficiency, responsiveness and quality of library services. Strategic and human-centred AI adoption is therefore essential for the

sustainable revitalization of university libraries and the enhancement of effective service delivery in Nigeria.

RECOMMENDATIONS

Based on the desk review, the following recommendations are made:

1. Adequate funding should be provided: University management and relevant government agencies should allocate sufficient and sustainable funds for AI infrastructure, software, internet connectivity, maintenance and staff development.

2. AI-related infrastructure should be improved: University libraries should invest in reliable electricity, high-speed internet, modern computers, appropriate library management systems and other digital infrastructure required for effective AI integration.

3. Librarians should receive continuous training: Regular capacity-building programmes should be organized to equip librarians with competencies in AI tools, digital technologies, data management, information ethics and responsible use of generative AI.

4. Institutional AI policies should be developed: Universities should establish clear policies and guidelines addressing AI adoption, data privacy, intellectual property, ethical use, information security and human oversight.

5. AI should complement librarians: University libraries should promote a human-AI collaborative model, using AI to automate routine tasks while retaining librarians' professional judgment, expertise and ethical responsibilities.

6. User-centred AI services should be promoted: AI applications should be selected and implemented based on identified needs of students, lecturers and researchers, with regular assessment of user satisfaction and service effectiveness.

7. Strategic partnerships should be encouraged: University libraries should collaborate with ICT experts, AI professionals, library associations and technology institutions to strengthen technical capacity and facilitate sustainable AI adoption.

8. Continuous evaluation should be undertaken: Libraries should regularly assess AI-enabled services to determine their effectiveness, identify emerging challenges and ensure that AI contributes meaningfully to the revitalization of university libraries and enhancement of service delivery in Nigeria.

REFERENCES

Adamu, M. B., Abdullahi, M. A., & Mohammed, G. S. (2025). Application and use of artificial intelligence for effective library service delivery in federal university libraries in Nigeria. Evidence Based Journal of Information Science, 1 (2).

Achugbue, E. I. (2025). Artificial intelligence (AI) and the future of academic library services: A study of librarians AI skills in academic libraries in South-South Nigerian universities. Nigerbiblios: Journal of National Library of Nigeria, 34 (1), 36–49.

Bello, G. O., & Bankole, O. M. (2024). Assessing the quality of university library services by undergraduate library users of Federal University Oye–Ekiti, Ekiti State, Nigeria. FKJOLIS, 9 (2), 14–29.

Idhalama, O. U., & Nwachukwu, P. I. (2025). Assessing the application of artificial intelligence and machine learning technologies in library services in Africa. Library Management, 46 (5), 386–400.

Igbo, H. U., Imo, N. T., Jidere, U. J., & Ugwu, F. N. (2025). Adopting artificial intelligence in academic library services in Nigeria: Requirements and challenges. Nigerbiblios: Journal of National Library of Nigeria, 34 (1), 1–18.

Jibga, D. M. (2025). The impact of artificial intelligence on library services delivery in academic libraries in Nigeria. Dala Journal of Library and Information Practice, 3 (1).

Nkomo, S., & Matli, W. (2025). Adoption of artificial intelligence for library services at universities in Africa: Are we there yet? South African Journal of Libraries and Information Science, 91 (2), 1–12.

Odigie, I. O. (2024). Exploring the awareness, use and challenges facing the integration of artificial intelligence in library services by librarians in university libraries in North-Central, Nigeria. Communicate: Journal of Library and Information Science.

Ogungbenro, O. D., Esse, U. C., Olowoporoku, I., & Christopher, A. (2025). Revolutionizing library services: The impact of artificial intelligence on cataloguing and access to information in Nigeria academic libraries. Journal of Library Metadata, 25 (2), 99–118.

Orubebe, E. D., Braide, D., & Oladokun, B. D. (2025). Librarians' perception and readiness in adopting AI technology in academic libraries. Edulib, 15 (1).

Oton, A. S., & Kolawole, D. T. O. (2025). Introduction of artificial intelligence to library services in Nigeria. Journal of Information Science.

Ugbor, C. A., Makinde, E. T., & Owoeye, S. O. (2024). Artificial intelligence adoption in Nigerian academic libraries: Issues, challenges and prospects. Bayero Journal of Education in Africa, 10 (4).

UNESCO. (2023). Guidance for generative AI in education and research. UNESCO.