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ASSESSMENT OF LEVEL OF AWARENESS AND UTILISATION OF ARTIFICIAL INTELLIGENCE (AI) IN ACADEMIC LIBRARIES IN COLLEGES OF EDUCATION IN THE NORTH CENTRAL ZONE, NIGERIA

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Abstract

This study assessed the level of awareness and utilisation of Artificial Intelligence (AI) in academic libraries within Colleges of Education in the North-Central zone of Nigeria. The study adopted a descriptive survey research design. The target population comprised approximately 1,200 library personnel across the region. Using a multi-stage sampling technique, a representative sample of 480 respondents was drawn from three purposively and stratified selected institutions: FCT College of Education, Zuba, Abuja; College of Education, Minna; and College of Education, Ankpa (representing Kogi State). Data were collected using a validated, structured questionnaire titled "Awareness and Utilisation of AI in Academic Libraries Questionnaire (AUALQ)", which yielded a Cronbach's Alpha reliability coefficient of 0.78. Descriptive statistics of Mean Score ($\bar{X}$) and Standard Deviation (SD) were used to analyze the research questions against a criterion mean benchmark of 2.50. The findings revealed that the level of awareness of core library-specific AI technologies (such as intelligent search, automated cataloging, and

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recommendation algorithms) among library staff and users was low (Grand Mean = 2.44), despite a high awareness of consumer-grade generative tools like chatbots. Furthermore, the systematic utilisation of AI in the libraries' operational and workflow systems was found to be at a very low extent (Grand Mean = 1.92), with predictive analytics and automated acquisition scoring the lowest. Based on the findings, it was recommended among others that the managements of Colleges of Education in the North-Central zone should prioritize infrastructural upgrades, establish national policy frameworks for library digitalization, and sponsor mandatory, continuous professional development programs on AI applications for library staff.

Introduction

The advent of Artificial Intelligence (AI) has transformed various sectors globally. The sectors AI has transformed include; education, healthcare, agriculture and more significantly, the management of academic libraries. In the context of academic libraries in Colleges of Education in Nigeria particularly within the North-Central zone, the adoption of AI offers numerous benefits. It enhances library operations, improves user services, and aligns library functions with contemporary technological trends. Despite these benefits, the extent of awareness and use of AI tools in this context requires deeper exploration especially given the unique challenges faced by academic libraries in developing countries, and Nigeria is not excepted. Academic libraries serve as critical hubs for knowledge dissemination, resource access and educational support (Aina, 2014). In Colleges of Education, these libraries are essential for pre-service teacher training, curriculum development and research. The integration of AI technologies such as chatbots, recommendation systems, intelligent cataloging and automated library systems has the potential to revolutionize these libraries. By automating routine tasks and enhancing service delivery, AI enables librarians to focus more on specialized roles such as research guidance and user engagement (Okike, 2021).

However, the awareness of AI technologies among library staff and users is a fundamental precursor to effective use. Awareness encompasses understanding AI's capabilities, benefits and relevance in library operations (Onyancha, 2019). In the North-Central zone of Nigeria, factors such as limited exposure to advanced technologies, inadequate training opportunities and infrastructural deficits often impede this awareness. Many library personnel in Colleges of Education may be unfamiliar with AI's potential applications, relying instead on traditional library management systems. The use of AI in academic libraries spans various applications. Intelligent search algorithms can improve information retrieval, while natural language processing (NLP) tools can simplify user

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queries. Virtual assistants powered by AI enhance user interaction by providing real-time support for library services. Also, predictive analytics can help in resource management such as forecasting demand for specific materials. These applications not only improve efficiency but also foster a user-centric approach to library services (Oyedum & Quadri, 2020).

Regardless of these opportunities, the implementation of AI in academic libraries in North-Central Nigeria may face challenges such as; limited funding for technological advancements is a significant barrier coupled with inconsistent electricity supply and unreliable internet connectivity. Also, a shortage of skilled personnel who can effectively implement and maintain AI systems exacerbates the problem (Ifijeh & Yusuf, 2020). Addressing these challenges requires strategic interventions which this research intends to attain. The level of awareness and utilisation of AI in academic libraries in Colleges of Education in North-Central Nigeria are still in nascent stages, there is need for immense potential for growth. By harnessing AI, academic libraries in this zone can profoundly enhance their service delivery and contribute to the broader goals of library services.

Problem Statement

In Nigeria particularly within Colleges of Education in the North Central region, the awareness and use of AI in academic libraries remain relatively unexplored and underdeveloped. Despite the global recognition of AI's potential to revolutionize library services that ranges from automated cataloging and recommendation systems to predictive analytics and virtual reference services. There is limited empirical evidence on the extent to which these innovations are known and use by library staff and patrons in this context. This raises concerns about whether academic libraries in the region are fully equipped to meet the evolving demands of 21st-century education and knowledge dissemination. Factors such as inadequate training, limited access to AI tools, infrastructural challenges and low levels of digital literacy may hinder the adoption of AI in these libraries. Also, the lack of awareness among stakeholders regarding the potential benefits of AI in enhancing library services could contribute to a slow uptake of these technologies. Understanding the current state of awareness and use of AI in academic libraries within this region is essential to addressing these challenges by identifying opportunities for growth and developing strategies to integrate AI effectively into library operations. Therefore, this study aim at the assessment of the level of awareness and utilisation of AI in academic libraries in Colleges of Education in North-Central Nigeria.

Objective of the Study

The purpose of the study is to assess the level of awareness and utilisation of AI in academic libraries in Colleges of Education in North-Central Nigeria. The study seek to address the following:

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1. To determine the level of awareness of AI technologies among library staff and users in the Colleges of Education in North-Central zone.
2. To ascertain the level of utilisation of AI tools in academic libraries in the Colleges of Education in North-Central zone.
3. To determine the extent of use of AI among library staff in the Colleges of Education in the North-Central zone.

Research Questions

The following research questions will guide the study:

1. What is the level of awareness of AI technologies among library staff and users in colleges of education in North-Central zone of Nigeria?
2. What is the level of utilisation of AI in academic libraries in North-Central zone of Nigeria?
3. What is the extent of use of AI among library staff in Colleges of Education in the North-Central zone of Nigeria?

Literature Review

Advancements in Information and Communication Technology (ICT) continually push the boundaries of human progress particularly in the field of Library and Information Science. Over the past seven decades, we have witnessed significant progress in storage technologies that evolve from floppy disks to hard drives and solid-state drives. The development of computers and interconnected information systems has given rise to intelligent systems that include Artificial Intelligence (AI). A notable example is ChatGPT developed by Open AI which utilises extensive training on diverse datasets to generate human-like that is contextually relevant responses across various subjects (Dwivedi, Kshetri, Hughes, Slade, Jeyaraj, Kar & Wright, 2023). This capability has sparked awe and critical reflection on AI's potential. Globally, Higher institutions are experiencing a transformative shift fueled by AI advancements. Libraries as traditional hubs of knowledge have been pivotal in this information evolution. In Nigerian Higher institutions, AI offers immense potential to revolutionize library services but its integration requires careful attention to the specific challenges faced by these institutions. The ultimate goal of AI in libraries is to create systems capable of processing diverse digital formats (text, images, video, and audio) at a level that rivals human intelligence, with profound implications for librarianship (Gasparini & Kautonen, 2022).

AI is emerging as a game-changer in various fields including librarianship where it is enhancing service delivery, efficiency and user experience. By integrating AI, libraries can streamline operations, personalize services and improve information retrieval. For instance, AI-powered tools can automatically classify, tag and organize large volumes of

digital content, simplifying navigation through complex collections. These systems employ machine learning algorithms to analyze metadata, text and user interactions that increases the accuracy and relevance of search results. This innovation helps users such as students efficiently access resources, generate summaries, identify keywords and find related materials, thus expediting the research process (Bisht, Nautiyal, Sharma, Sati, Bathla & Singh, 2023). AI has also transformed library services through the deployment of chatbots and virtual assistants that provide instant support. These intelligent agents can handle inquiries, assist with reference services and offer personalized recommendations based on user preferences and browsing habits. Utilizing natural language processing (NLP) and sentiment analysis, these chatbots engage meaningfully with users and ensure 24/7 assistance (Teel, 2024).

However, librarians have varying levels of awareness of artificial intelligence (AI) use. Though, studies indicate that while many librarians in Nigerian academic institutions are aware of AI and its potential, the level of adoption remains limited. Odigie (2024) highlights that librarians in Nigeria are aware of AI tools like ChatGPT but use them primarily for personal purposes rather than professional services. This awareness emphasize the need for structured training to bridge the gap between knowledge and application. Also, Harisanty, Anna, Putri, Firdaus, & Noor, (2022) revealed that library leaders, practitioners and researchers in Indonesian academic libraries have a positive attitude toward AI and are prepared to implement AI-driven initiatives. Several factors influence a library's readiness for AI adoption including awareness, acceptance, perceived value, prior application experience, leadership focus, environment fostering innovation and competitive pressures (Yakubu, 2023). However, some perspectives suggest that certain librarians remain uncertain about the future role of AI in research libraries and the evolving responsibilities of libraries and librarians in the AI era (Gasparini & Kautonen, 2022). In Nigeria, librarians are aware of the global integration of AI into library systems, they express mixed opinions regarding the preparedness of academic libraries for AI adoption (Adeyinka, Khadijah, Salawu & Abdullahi, 2022). Meanwhile, Nigerian students acknowledge the use of AI in library operations and emphasize the importance of possessing basic computer skills in this digital age (Abayomi, Adeleke, Nurudeen & Oluwaseun, 2022).

A study by Odigie (2024) revealed that while many reference librarians are aware of AI tools like ChatGPT and Gemini, their application remains predominantly personal rather than professional. Challenges such as inadequate training and infrastructural deficits hinder the extent of utilisation of AI in library services. Similarly, research by Igbo, Adeyemi & Mohammed (2025) identified prerequisites for AI adoption including the availability of policy frameworks, digital infrastructure, and skilled personnel. They also highlighted challenges like high implementation costs, technical skill shortages, and

unreliable power supply. Furthermore, Adeleke Nwankwo & Yusuf (2024) found that AI usage in Nigerian university libraries is in its infancy and often inadvertent. Constraints such as insufficient funding, lack of requisite skills, and poor infrastructure, especially unreliable power supply and poor internet access, were identified as significant barriers. Addressing these issues through targeted training programs and infrastructure investments is crucial for the effective adoption of AI in these libraries. By understanding librarians' perspectives and addressing their concerns, libraries can harness the transformative potential of AI to enhance service delivery and meet the evolving needs of their clientele in the digital era

AI applications in libraries include automated indexing, reference services, acquisition management, and personalized user recommendations. According to Adejo and Misau (2021) Nigerian academic libraries have started exploring AI technologies like expert systems and robotics to improve operational efficiency. However, these applications remain in their infancy due to infrastructural and funding challenges. Although, some of the steps to improve library services through AI in Nigerian Libraries include having a policy, performing some consultations, and training and retraining library staff (Bello & Abdulsallam (2023). At the same time, Subaveerapandiyan, Sunanthini & Amees, (2023) highlighted the perceived fear of AI replacing librarian roles thereby creating barriers. Key barriers to AI adoption in Nigerian academic libraries include inadequate funding, lack of technical expertise, and insufficient infrastructure. Salman, Ismaila, & Ajani (2024) identify that limited training opportunities for librarians and a lack of institutional support hinder the effective deployment of AI tools. Also, concerns about job displacement and ethical issues further complicate adoption. Libraries need to consider the limitations and challenges of AI adoption and make informed decisions about technology investments and operations. Training of librarians and curriculum reviews for library schools are recommended to facilitate the integration of AI in libraries.

Research Methodology

The study adopted a descriptive survey research design. This design was deemed suitable as it sought to describe and analyze the level of awareness and utilisation of artificial intelligence (AI) technologies in academic libraries within Colleges of Education in the North Central zone of Nigeria. The target population of this study consisted of all library staff in the Colleges of Education in the North Central Region. The estimated population of the study was approximately 1,200 library personnel. The study employed a multi-stage sampling technique. In the first stage, purposive sampling was used to select three (3) Colleges of Education that were geographically and administratively representative of the region. In the second stage, stratified random sampling was used to categorize the staff into professional librarians, paraprofessional staff, and technical staff in three (3)

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institutions, namely: FCT College of Education, Zuba, Abuja; College of Education, Minna; and College of Education, Ankpa. From these, 40% of the total population in each institution was randomly selected, yielding a sample size of 480 respondents.

The instrument used for data collection was a structured questionnaire titled *"Awareness and Utilisation of AI in Academic Libraries Questionnaire (AUALQ)"*. The study utilized a 4-point rating scale with numerical values assigned as follows: Very High Extent (VHE) = 4 points, High Extent (HE) = 3 points, Low Extent (LE) = 2 points and Very Low Extent (VLE) = 1 point. The instrument was subjected to face and content validation by three experts: one in Library Science, one in Computer Science (AI), and one in Educational Research and Measurement at the University of Nigeria, Nsukka. Their suggestions and corrections were fully incorporated into the final draft of the questionnaire to ensure clarity and relevance. To determine the reliability of the instrument, a trial test was conducted using 30 librarians from Colleges of Education outside the study area. The data obtained from the trial test were analyzed using the Cronbach's Alpha method to ensure the internal consistency of the instrument. A reliability coefficient of 0.78 was obtained, which was deemed acceptable since it exceeded the 0.75 benchmark.

Data collection took place over a period of four weeks. Four (4) trained research assistants accompanied the researchers to administer the questionnaires physically and electronically to ensure broad participation. Respondents were assured of strict confidentiality and anonymity. Descriptive statistics of Mean ($\bar{X}$) and Standard Deviation (SD) were used to analyze the research questions. A criterion mean of 2.50 was established as the benchmark for decision-making; items with a mean score of 2.50 and above were accepted/rated as high, while items with a mean score below 2.50 were rejected/rated as low.

Results

Research Question 1: What is the level of awareness of AI technologies among library staff and users in Colleges of Education in the North-Central zone of Nigeria?

Table 1: Mean and Standard Deviation of the Level of Awareness of AI Technologies.

S/N	AI Technology Items	$\bar{X}$	SD	Dec. Remark
1	Awareness of AI-powered chatbots (e.g., ChatGPT, Gemini) for reference services.	2.84	0.82	High
2	Awareness of intelligent search algorithms for enhanced information retrieval.	2.31	0.91	Low
3	Awareness of automated/intelligent cataloging and indexing software.	2.10	0.88	Low

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S/N	AI Technology Items	$\bar{X}$	SD	Dec. Remark
4	Awareness of machine learning-based recommendation systems in library catalogs.	2.25	0.79	Low
5	Awareness of AI voice-activated virtual assistants (e.g., Alexa, Siri) for library navigation.	2.68	0.95	High
Overall	**Grand Mean and Standard Deviation**	**2.44**	**0.87**	**Low Extent**

The data presented in Table 1 reveals the level of awareness of AI technologies among library staff and users. Respondents indicated a high level of awareness of AI-powered chatbots ($\bar{X}$=2.84,SD=0.82) and AI voice-activated virtual assistants ($\bar{X}$=2.68,SD=0.95). Conversely, there was a low level of awareness regarding intelligent search algorithms ($\bar{X}$=2.31,SD=0.91), automated/intelligent cataloging and indexing ($\bar{X}$=2.10,SD=0.88), and machine learning-based recommendation systems ($\bar{X}$=2.25,SD=0.79). The overall grand mean of 2.44 falls below the decision benchmark of 2.50. This indicates that, on the whole, the level of awareness of core library-specific AI technologies among library staff and users in Colleges of Education in the North-Central zone of Nigeria is to a low extent.

Research Question 2: What is the level of utilisation of AI in academic libraries in the North-Central zone of Nigeria?

Table 2: Mean and Standard Deviation of the Level of Utilisation of AI in Academic Libraries

S/N	AI Utilisation Items	$\bar{X}$	SD	Dec. Remark
6	Use of AI tools in automated acquisition and collection development.	1.88	0.71	Low
7	Use of automated indexing systems to classify digital library materials.	1.95	0.74	Low
8	Deployment of AI chatbots to provide 24/7 virtual reference assistance to users.	2.12	0.83	Low
9	Use of predictive analytics to forecast resource demand and patron preferences.	1.64	0.62	Low
10	Integration of NLP (Natural Language Processing) tools to process complex search queries.	2.01	0.78	Low
Overall	**Grand Mean and Standard Deviation**	**1.92**	**0.74**	**Low Extent**

Table 2 shows the level of utilisation of AI tools within the studied academic libraries. The results indicate that all assessed items fell significantly below the 2.50 criterion benchmark. The lowest utilisation was recorded for predictive analytics to forecast

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resource demand (X^{-}=1.64,SD=0.62), followed closely by AI tools in automated acquisition (X^{-}=1.88,SD=0.71). The use of AI chatbots for virtual reference assistance registered a slightly higher but still low mean score (X^{-}=2.12,SD=0.83). With an overall grand mean of 1.92, the findings demonstrate that the level of utilisation of AI tools in academic libraries in Colleges of Education in the North-Central zone of Nigeria is to a very low extent. AI technologies have not yet been meaningfully integrated into standard library operations or workflow systems in this region.

Research Question 3: What is the extent of use of AI among library staff in Colleges of Education in the North-Central zone of Nigeria?

Table 3: Mean and Standard Deviation of the Extent of Personal AI Use by Library Staff

S/N	Personal Staff AI Use Items	X^{-}	SD	Dec. Remark
11	Personal use of generative AI (e.g., ChatGPT) to draft emails and correspondence.	2.89	0.85	High
12	Personal use of translation and paraphrasing tools for research writing.	2.76	0.81	High
13	Use of AI tools to compile bibliography lists and format research citations.	2.22	0.89	Low
14	Personal use of AI tools to generate content/summaries of lengthy articles.	2.54	0.83	High
15	Use of AI tools to design library promotional materials or newsletters.	1.98	0.72	Low
Overall	**Grand Mean and Standard Deviation**	**2.48**	**0.82**	**Low Extent**

Table 3 presents the findings regarding the personal and professional extent of AI use among individual library staff members. The data reveals that library staff use AI to a high extent for drafting emails and official correspondence (X^{-}=2.89,SD=0.85), using translation and paraphrasing software for research writing (X^{-}=2.76,SD=0.81) and generating summaries of long articles (X^{-}=2.54,SD=0.83). However, the use of AI for specialized tasks like compiling bibliography/citation lists (X^{-}=2.22,SD=0.89) and designing library promotional materials (X^{-}=1.98,SD=0.72) remains low. The grand mean of 2.48 sits just marginally below the 2.50 benchmark. This indicates that while library staff are beginning to personally adopt general-purpose, web-based generative AI tools to assist with administrative and research tasks, their systematic, work-integrated professional use of AI within the library remains to a low extent.

Discussion of Findings

The empirical results of this study indicated in Table one that the level of awareness of core, library-specific AI technologies among library staff and users in Colleges of

Education in the North-Central zone of Nigeria is low (Grand Mean = 2.44). A closer inspection of the itemized results revealed a stark polarization in awareness: while respondents demonstrated a high awareness of generic consumer AI applications specifically conversational chatbots like ChatGPT and Gemini ($\bar{X}$=2.84) and voice assistants like Siri and Alexa ($\bar{X}$=2.68)—their awareness of specialized, domain-specific systems like intelligent search algorithms ($\bar{X}$=2.31), machine learning recommendations ($\bar{X}$=2.25), and automated cataloging software ($\bar{X}$=2.10) was critically low. This finding aligns directly with the observations of Odigie (2024), who argued that while Nigerian academic librarians are broadly aware of prominent AI platforms (specifically ChatGPT), their understanding is superficial and leans heavily toward general personal convenience rather than structural professional applications. The low level of professional AI awareness observed in this study can be attributed to the infrastructural and training deficits highlighted by Onyancha (2019). Without hands-on exposure to functional, integrated library systems (such as machine learning-enhanced Online Public Access Catalogs - OPACs), library staff and users naturally conceptualize AI only through the narrow lens of the popular, web-based tools they encounter in their daily lives.

Regarding the practical implementation of AI within the studied academic libraries, the findings in Table two painted a clear picture of underutilization, with a very low overall grand mean of 1.92. Every institutional-level AI application assessed ranging from automated acquisition ($\bar{X}$=1.88) and automated indexing ($\bar{X}$=1.95) to the deployment of virtual reference chatbots ($\bar{X}$=2.12) and predictive demand forecasting ($\bar{X}$=1.64) fell drastically below the 2.50 decision benchmark. This empirical finding strongly corroborates the research of Adeleke, Nwankwo, and Yusuf (2024), who concluded that AI usage in Nigerian university libraries remains in a state of infancy and is often accidental rather than systematic. The extremely low mean for predictive analytics in resource management (1.64) highlights a complete absence of data-driven decision-making frameworks within these libraries. In the absence of stable power grids, high-speed internet, and customized software licenses, academic libraries in the North-Central Colleges of Education remain tethered to traditional, semi-automated, or manual workflows, rendering the actual utilisation of AI almost non-existent.

At the individual level, the extent of personal and professional AI use among library staff was also found in Table three to be low, yielding a grand mean of 2.48, which sits marginally below the criterion benchmark of 2.50. However, the data revealed that staff are actively exploiting general-purpose AI tools to assist with administrative and academic tasks. Specifically, staff use generative AI to a high extent for drafting letters and emails ($\bar{X}$=2.89), translating or paraphrasing text for research ($\bar{X}$=2.76), and summarizing lengthy professional articles ($\bar{X}$=2.54). Conversely, their use of AI for core librarianship duties, such as compiling bibliographies ($\bar{X}$=2.22) or designing library-specific promotional

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outreach ($\bar{X}$=1.98), remains low. This trend mirrors the findings of Odigie (2024) and Harisanty et al. (2022), indicating that library personnel possess a high level of personal readiness and a positive attitude toward adopting technology, but lack the structural avenues to channel this enthusiasm into professional workflows. Staff members are independently learning to use large language models (LLMs) to bypass routine administrative writing, but they are not using AI to catalog books, manage databases, or assist students with complex academic queries.

Conclusion

The integration of Artificial Intelligence represents the next frontier of academic librarianship, offering unparalleled opportunities to streamline cataloging, automate reference services, and personalize the user experience. However, this study concludes that academic libraries within Colleges of Education in the North-Central zone of Nigeria are currently being left behind in this global technological shift. While individual library staff members are demonstrating a commendable personal initiative in utilizing basic, web-based generative AI tools to assist with everyday administrative writing, their understanding and awareness of professional, library-specific AI software remains deeply deficient. Crucially, at the institutional level, the systematic utilisation of AI tools is virtually non-existent, paralyzed by deep-seated infrastructural challenges, funding constraints, and a complete absence of guiding policy frameworks. Ultimately, if the Colleges of Education in this region are to fulfill their mandate of producing 21st-century, digitally literate educators, their academic libraries must transition from passive observers of the AI revolution into active, structurally supported adopters.

Recommendations

Based on the empirical findings and conclusions of this study, the following recommendations are made:

1. The managements of Colleges of Education, in partnership with the Committee of College Librarians, should organize compulsory, hands-on capacity-building workshops and continuous professional development (CPD) programs. These trainings must move beyond general AI tools like ChatGPT and focus on domain-specific systems, including automated cataloging, AI-driven information retrieval, and digital reference tools.
2. Institutional administrators and governing bodies must prioritize the provision of basic technological prerequisites. This includes investing in sustainable alternative energy sources (such as solar power grids) to solve the electricity crisis, securing high-speed, reliable internet bandwidth, and acquiring modern library management systems capable of integrating machine learning modules.

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3. The Federal Ministry of Education, along with the National Commission for Colleges of Education (NCCE), should draft clear policy frameworks and guidelines for the ethical integration and financing of AI systems within academic libraries. This will provide a structured pathway for acquisition, resource allocation, and data privacy management.
4. Rather than waiting for heavy, expensive custom software, library managers should actively seek out and implement open-source, low-resource AI tools. Examples include deploying basic, free open-source chatbot APIs on the library's web pages to handle basic user reference questions.
5. To ensure long-term sustainability, library schools and universities across Nigeria must revise their current curricula. Emerging concepts in data science, artificial intelligence, and digital curation must be integrated into undergraduate and postgraduate Library and Information Science (LIS) programs to prepare pre-service librarians for a digital-first workspace.

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