

Exploring the awareness, use and challenges facing the integration of artificial intelligence in library services by librarians in university libraries in North-Central, Nigeria

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Abstract

This research delves into the integration of artificial intelligence (AI) in Nigerian university libraries, exploring the awareness, adoption, and potential impact of AI on library services. The study employs a qualitative approach, utilizing a case study design to capture the perspectives of reference librarians in the north-central geopolitical zone of Nigeria. Data were collected through semi-structured interviews with 52 reference librarians, focusing on their awareness of AI, motivators and mitigators to its use in library services, and concerns regarding its potential impact. Findings reveal that while reference librarians demonstrate a substantial awareness of AI tools such as ChatGPT and Gemini, their utilisation remains primarily for personal use rather than professional service delivery within libraries. Challenges such as training, and infrastructure mitigated the integration of AI into library operations, restricting its effectiveness in supporting students and faculty. This research underscores the need for targeted training programs and infrastructure investments to facilitate the effective adoption of AI in Nigerian university 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.

Keywords: challenges, artificial intelligence, library services, awareness, university librarians

INTRODUCTION

Development and advancements in Information and Communication Technology always advance the frontiers of humanity, especially in the field of Library and Information science. Looking back over the past seven (7) decades, we have seen advancements and developments in storage technologies from the floppy to hard disk drives and solid-state drives, the development of computers and information systems and linking or interoperability of these systems creating intelligent systems or artificial intelligence. An example of such a system is ChatGPT developed by OPENAI an artificial intelligence laboratory. The system is designed to provide human-like input based on training from a diverse range of data, thereby enabling it to generate coherent and contextually relevant responses across various domains or subject areas (Dwivedi et al., 2023). This unique ability makes individuals marvel and question the potential of Artificial intelligence. Universities across the globe are undergoing a transformative shift driven by advancements in Artificial Intelligence (AI). Libraries, traditionally custodians of knowledge and information, were at the forefront of the information evolution and explosion. AI therefore presents a unique opportunity to revolutionize library services in Nigerian universities, but its successful integration requires careful consideration of the context and unique challenges faced by these institutions.

The ultimate promise of Artificial intelligence in libraries is the development of computer systems that can process digital thought (text, image, video and sound) and rival human intelligence, with significant implications for librarianship (Omame, et al 2020). The emergence of Artificial Intelligence (AI) has come to light as a transformative force across a range of sectors, and libraries are no exception. In the field of librarianship, AI is revolutionizing the delivery of services, offering novel solutions to enhance efficiency, accessibility, and user experience. By harnessing the power of AI, libraries can now streamline their operations, personalize services, and augment information retrieval processes. One of the primary applications of AI in libraries is in information organization and management.

AI-powered systems can automatically classify, tag, and categorize vast amounts of digital content based on prompts or commands making it easier for users to navigate through complex collections. These systems employ machine learning algorithms to analyse metadata, text, and user interactions, thereby improving the accuracy and relevance of results from searches. As a result, patrons can discover relevant resources more efficiently, enhancing their overall satisfaction with library services. Imagine a student struggling to go through lots of research papers to develop his research problem. AI-powered tools could automatically generate summaries, identify relevant keywords, and suggest related materials, significantly streamlining the research process. Other forms through which AI has revamped library services are through AI-driven chatbots and virtual assistants being deployed in libraries to provide instant support and guidance to users (Panda & Chakravarty, 2022; Jha, 2023).

These intelligent agents (AI) can answer common inquiries, assist with reference services, and even facilitate personalised recommendations based on user preferences and browsing history. By leveraging natural language processing (NLP) and sentiment analysis, these chatbots can engage in meaningful interactions with patrons, offering timely assistance around the clock. AI technologies are also revolutionizing the preservation and digitization of cultural heritage materials in libraries (Teel, 2024). we now have advanced image recognition algorithms or AI-powered tools which enhance the accuracy of optical character recognition (OCR) thereby enabling faster image processing and digitization of archival documents, rare manuscripts, and historical artefacts, ensuring their long-term preservation and accessibility to a global audience.

Statement of the Problem

Universities are navigating a crucial juncture in their evolution. As the world embraces artificial intelligence technologies' transformative potential, a fundamental question arises in developing countries, how can libraries leverage artificial intelligence (AI) to enhance service delivery and support the educational needs of students and faculty in the digital age? Librarians, traditionally known as the custodians of knowledge and information, recognize the immense possibilities that AI presents, having envisioned its possibilities they have deployed AI-powered chatbots towards providing 24/7 assistance, intelligent systems curating learning resources within the library, and sophisticated search algorithms uncovering research gems students and faculty might otherwise miss. Thereby freeing up librarians' time, allowing them to focus on providing personalized guidance and support to students and faculty.

However, the integration of AI in Nigerian university libraries remains in its early stages and, careful review of literatures highlights there is also a critical shortage of research exploring the perceptions or perspectives of librarians in Nigerian universities especially as it relates to AI and its potential integration for the delivery of services. This knowledge gap could potentially hinder the development and implementation of AI-powered library services tailored to the specific needs of Nigerian students and other clientele of Nigerian libraries.

Based on librarians' perceptions of AI, the research intends to provide valuable insights into the unexploited potential and current limitations of AI adoption in Nigerian university libraries. Thereby informing the development of targeted training programs for librarians on using AI effectively. It will also shed light on critical infrastructure and resource needs for successful implementation, ultimately leading to a transformation in how libraries deliver services to students and faculty.

Objectives of the Study

1. To understand the level to which librarians are aware of Artificial intelligence in Nigerian University libraries.
2. To identify factors motivating/militating the use of AI for the delivery of Services in Nigerian University Libraries.
3. To highlight challenges librarians have regarding the potential impact of AI on their roles and responsibilities within the library ecosystem.

REVIEW OF LITERATURE

Literature was reviewed in line with the stated objectives and under the following headings; extent of awareness and use of artificial intelligence, benefits, and concerns in the adoption of AI.

Awareness and Use of Artificial Intelligence

Awareness and use are often closely linked together in search and information literacy text. Awareness of a thing is synonymous to the use of such, librarians have varying levels of awareness of artificial intelligence (AI) use. In a paper titled Exploring the Implementation of Artificial Intelligence Applications among Academic Libraries in Taiwan, the researchers explored the different artificial intelligence (AI) applications used in academic libraries and the key factors and impediments related to their implementation, they found that librarians recognised that AI applications are inevitable, but indicated that the difficulties of in execution have hampered the adoption of AI (Xu, 2023 & Huang, 2022). Other views show some librarians are uncertain about the future of AI in research libraries and the roles of libraries and librarians in AI (Gasparini, & Kautonen, 2022). In Nigeria, librarians are aware of the integration of AI systems in libraries globally, but they have mixed feelings about the readiness of academic libraries to adopt AI (Yusuf, et al 2022). Students in Nigeria are aware of the usage of AI in library operations and recognize the need for basic computer skills in this era (Abayomi, et al 2022). Another study by Harisanty, et al (2022) highlighted that library leaders, practitioners, and scientists in Indonesian academic libraries have a favourable outlook on AI and are ready to implement AI initiatives. Factors such as AI awareness, acceptance, value perception, application experience, leadership

attention, innovation atmosphere, and competitive pressure influence a library's readiness to adopt AI (Bisht, 2023 & Yakubu, 2023).

Benefits and Concerns and Challenges in the Adoption of AI

The adoption of artificial intelligence (AI) in libraries offers several benefits, including improved efficiency, accuracy, and user experience in library cataloguing, management, and operations (Sianturi, 2024 & Bisht, et al 2023). Similarly, AI technology enhances library data management, provides personalized recommendations based on user preferences and reading habits, and helps identify customers' interests (Bisht, et al 2023 & Lin, et al 2023). In the same vein, it can also support reference services, information retrieval, cataloguing and classification, and collection management. Some concerns hinder the adoption of AI in libraries, such as a lack of infrastructure, funding, and awareness among librarians. Bello & Abdulsallam (2023), further reported 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. At the same time, Subaveerapandiyan, et al (2023) highlighted the perceived fear of AI replacing librarian roles thereby creating barriers. 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 qualitative research method with a case study research design to answer the stated objectives. The choice of study was deemed fit due to opinions by Creswell & Creswell, (2018) and Denscombe, (2007) who highlight this set of methodology and design as best suited in situations where the researcher is describing or exploring a phenomenon. The population of the study was made up of all reference librarians in universities from the north-central geopolitical zone of Nigeria who deal with or interact with students daily to meet their information needs. The population of reference librarians were purposively sampled to obtain fifty-two (52) reference librarians from seven (7) universities. Table 1 below shows the sample distribution for the study from the various Nigerian university libraries. The research instrument was an interview guide used to collect data from fifty-two (52) reference librarians in fifty-five (55) interview sessions over the phone that lasted for two weeks. The data from the interview sessions were transcribed coded and used to answer the research objectives.

Nigerian University	No of the Librarians sampled
Federal University Lokoja	15
Federal University of Technology Minna	10
University of Abuja	9
University of Jos	5
University of Makurdi	6
Prince Abubakar Audu University	7
Total	52

Table 1: Number of Sampled librarians based on universities

DISCUSSION OF FINDINGS

The data collected from the study were thematically analysed, and the theme structure was based on the objectives of the research and developed from questions in the interview sessions with the reference librarians. The discussion below is a narrative discourse of these themes.

Extent of awareness of artificial intelligence

Respondents were asked questions to gauge their understanding of AI and their awareness of its capabilities, the responses obtained from the interview sessions showed reference librarians in Nigerian university libraries were aware to a large degree of AI and chatbots like ChatGPT and Gemini. They generally termed them as applications that could aid in research and research writing. Other responses indicated awareness of AI but not to a large degree; *“I have heard of people talking about AI from colleagues and in the news”*. The findings of the research are contrary to the findings of Gasparini, & Kautonen, (2022) who viewed the library personnel and leadership as uncertain on the path of AI in research. The findings are however in consonance with that of Yusuf et al (2023) who stated that librarians in Nigeria are aware of the integration of AI globally. The responses necessitated further questions which helped answer the second objective of the study.

Factors motivating/mitigating the Use of AI in the delivery of library services

Responses indicated mixed realities to the use of AI however, a significant portion of responses from the reference librarians sampled indicated they used AI for their personal use in research, as a paraphrasing tool and the general synthesizing of ideas. None of the respondents showed they had adopted AI into any services performed at the library. The findings however do not align with those of Harisanty, et al (2022) who highlighted that library leaders, practitioners, and scientists in Indonesian academics were ready to implement AI initiatives. This is indicative that the speed of technology adaptation and acceptance may vary based on continents. When asked about factors which motivated or mitigated their use of AI their responses attributed the low adaptation of AI to library services delivery to training, a lack of resources and infrastructure. These, however, are some of the major issues highlighted in Nigerian research. Further probing into the issue of motivating/mitigating factors highlighted that a motivator to the use of AI was the prompt responses received from the system while mitigating factors were training on the proper use of AI thus the low integration in the delivery of library services. These findings align with those of Abayomi, et al (2022) who recognised the need for certain skill sets in the era of artificial intelligence. This situation limits the effectiveness of libraries in supporting students and faculty in the digital age, potentially hindering the full potential of clientele.

Concerns of librarians regarding the potential impact of AI

Lastly, the research sought to find concerns of librarians regarding the potential impact of AI in Nigerian university libraries. The responses obtained highlighted mixed reactions, while some librarians were ready to fully embrace AI in their libraries, they were limited by environment. Other reactions were not so optimistic *“the computer is just giving me information and this is not plagiarism have you not heard of garbage in garbage out”* this raises concerns over ethical

considerations in the use of AI-generated data or information which had come to the limelight since the introduction and use of AI. Further queries on their concerns highlighted that the use of AI in libraries raises questions about data integrity in research, algorithmic bias which certain AI's algorithm had been accused of, and potential job displacement if integrated into library services. These findings agree with Subaveerapandiyan, et al (2023), who highlighted that library and information professionals expressed concern over artificial intelligence replacing librarian roles in the delivery of library services in Zambia. Librarians must be equipped with the knowledge and skills to navigate these ethical dilemmas and ensure that AI is deployed responsibly and inclusively, safeguarding the privacy and well-being of library users.

Summary of Findings

The findings from the study amongst others were: Reference librarians are aware of AI tools and their relevance as tools that aid research; The Use of AI was personal and had not transcended to professional use in library service delivery in Nigerian Libraries; there were mixed feelings towards the concerns of potential impact of AI in the roles and services of Librarians.

Conclusion

In conclusion, this research sheds light on the current landscape of artificial intelligence (AI) integration in Nigerian university libraries, highlighting both opportunities and challenges in leveraging AI to enhance service delivery. While reference librarians demonstrate a notable awareness of AI tools, the translation of this awareness into practical implementation within library services remains limited. Challenges such as inadequate resources, training gaps, and infrastructural constraints hinder the effective adoption of AI, hampering libraries' ability to fully support students and faculty in the digital age. Ethical considerations surrounding AI, including privacy concerns and algorithmic bias, further underscore the need for careful navigation and responsible deployment of AI technologies in libraries. Addressing these concerns and equipping librarians with the necessary skills are crucial steps towards harnessing the transformative potential of AI while ensuring inclusive and ethical practices. Moving forward, targeted training programs, investments in infrastructure, and collaborative efforts between stakeholders are essential to overcome barriers to AI adoption in Nigerian university libraries. By bridging the gap between awareness and implementation, libraries can unlock the full benefits of AI in improving efficiency, accessibility, and user experience, ultimately advancing their role as vital hubs of knowledge, and learning in the digital era.

Recommendation

1. Develop targeted training programs on using AI for library services this could be achieved through organize workshops and seminars to raise awareness of AI applications in libraries.
2. Institutional stakeholders should improve funding and resource allocation to cater for AI infrastructure in libraries. Also, partnership with tech companies could be adopted to explore cost-effective AI solutions for libraries and users.
3. Libraries could organize workshops on data privacy, algorithmic bias and develop ethical guidelines for AI implementation in libraries, further research and enlightenment also needs to be conducted on the impact of AI on librarian roles and explore reskilling opportunities.

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