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Apprehension, Realities and Skills for Artificial Intelligence Application to Library Services in Nigeria

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Abstract
This paper investigates the apprehensions, realities, and required skills for the application of artificial intelligence in libraries in Nigeria. A systematic literature review was used. The paper has five objectives: to investigate the level of AI publications in Nigeria compared to other countries; to examine the methodologies used in these publications; to identify librarians' apprehensions regarding the application of AI; to investigate the realities of AI; and to determine the skills needed by librarians for the implementation of AI in Nigerian libraries. The results show that librarians are apprehensive about losing their jobs and that a lack of funding has resulted in little interest in AI implementation. However, the realities indicate that the implementation of AI will save librarians time, improve service delivery, transform the library's image, assist in automating cataloguing and collection development, and provide enhanced services to people with disabilities. This paper also suggests that librarians should equip themselves with technical and professional skills, data mining capabilities, and ethical principles.The recommendations state that librarians should stop panicking about job loss and instead acquire the necessary skills to assist in AI implementation and application. Library schools should also improve their curriculum, and professionals should organize conferences and workshops to raise awareness among librarians. It is also recommended that qualitative and other methodologies be used to gain more insight into the nitty-gritty details of AI.
Keywords: *artificial intelligence, apprehension, realities, new skills for librarians, machine learning*

1.1 Introduction

Artificial intelligence (AI) is the combination of computer programs and systems, a property of machines expected to perform creative functions, solve problems, draw conclusions, and make decisions with human-like intelligence (Omehia, 2020). Oyewale (2023) avers that AI is capable of performing specific tasks. It can analyze large volumes of data to find patterns, offer predictions, and subsequently receive feedback. AI is a tool that can improve, update, and augment many digital applications without human intervention. Omehia (2020) affirms that AI is a machine system with the capabilities to capture, predict, recommend, and influence decisions in both virtual and real environments. It can

also generate models automatically as options for the presented information. Cox (2022) noted that AI is not a single technology buta combination of technologies with general applications across many sectors. It is a robot that interacts with people, understands them, and thinks like a human. AI provides robotic assistance in book reading, shelf organization, immersive learning, and expert systems for reference services (Jagannara, 2023). AI operates on perceptual recognition, unlike humans who operate on deep cognition. Some examples of AI in computers include natural language processing, speech recognition, self-driving systems, deep learning, machine learning, and robotics (Srinivasarao, n.d.).

Wang and Xu (2024) observed that AI has improved work efficiency and enhanced the intelligence and personalization of information services in the field of library and information science. It has changed the way information is accessed, managed, and disseminated, providing more dynamic and intelligent solutions that anticipate user needs and deliver personalized experiences (Alam, 2025). The potential of AI in libraries and information centers is enormous. Nevertheless, librarians in Nigeria are apprehensive about its emergence and its application to library services (Cox, 2022). According to O'Neil (2001), apprehension is the anxiety or fear that librarians have regarding the application of AI. Many librarians fear that the use of AI could lead to job losses. Is this apprehension justifiable? What is the reality? Reality is the actual state of affairs (O'Neil, 2001). Can the application of AI lead to job losses for librarians? And what are the necessary skills that librarians need to retain their jobs? Skills refer to the qualifications, competencies, and abilities required to use AI in carrying out library services. This paper investigates librarians' apprehensions regarding the application of AI to library services, the realities of AI implementation, and the skills necessary for librarians to remain relevant in their jobs.

1.2 Statement of the Problem

Many libraries in Nigeria have yet to adopt artificial intelligence, and where it is in use, it is still at an early stage. Cox (2022) cites the recurrent fear that AI may, in some way, replace human librarians as the reason for non-adoption of AI in libraries. Isiaka et al. (2024) added that Library and Information Science professionals are concerned that AI could take over their roles, which leads to caution regarding its adoption in various libraries. Lund et al. (2020) also agreed that the fear of job loss is a primary reason why many libraries have not adopted AI. Based on these observations, this paper investigates librarians' apprehensions and the realities of artificial intelligence in Nigerian libraries, as well as the necessary skills for librarians to cope in the era ofAI.

2.1 Literature Review

Artificial intelligence is designed to display features or characteristics related to human intelligence (Agbola & Solomon, n.d.). Bridges et al. (2024) note that "artificial intelligence" was famously coined in the 1950s at a research event at Dartmouth College in the U.S., although there is no universally shared understanding of its definition. Artificial intelligence (AI) is an innovation in which machines are used to perform tasks that humans can do, but faster and with greater efficiency when processing vast amounts of data and making predictions. The benefits of AI significantly outweigh its costs, as it can enhance productivity, boost economic growth, and improve decision-making processes by solving complex problems and accurately managing repetitive tasks (Yakubu et al., 2023). Honghai et al. (2020) noted that AI technologies can understand images, audio, and other media, answering questions seamlessly from a self-generated or pre-stored knowledge base. AI can achieve goals through environmental understanding and strategic planning.

Thus far, AI has shown itself to be highly advantageous and helpful across a variety of fields, and it can assist libraries in updating, expanding their services, and maintaining their relevance in the contemporary digital environment. Libraries can leverage the practical advantages of AI for their own objectives, such as optimizing processes, improving operational efficiency, and developing new services (Bassey & Owushi, 2023). Oyetola et al. (2023) also noted that libraries can capitalize on AI to optimize workflows, maximize performance, and develop innovative services. While Akinola (2024) explains that some librarians are excited about the potential of AI, others remain apprehensive about its implementation. Despite the benefits of AI, Busayo et al. (2024) explain that libraries in Nigeria have yet to fully implement its potential. Cox (2022) again cites the fear of AI replacing human librarians' work. Conversely, Kalbande et al. (2024) stress the need for training and ethical guidelines rather than mere apprehension. Librarians must understand AI-powered services, develop competence, and cultivate positive attitudes toward AI adoption in libraries.

3.1 Research Method

This paper uses the Kitchenham & Charters (2007) methodology, which provides a credible evaluation of the topic under review. The methodology consists of three steps:

1. **Planning the Systematic Literature Review (SLR):** Establish the needs and objectives of the review, formulate research questions, and develop the review protocol.
2. **Conducting the Systematic Literature Review (SLR):** Formulate the search strategy according to the protocol, include relevant literature, and exclude irrelevant sources.
3. **Reporting the Systematic Literature Review (SLR):** Present the literature review findings effectively.

Planning the Systematic Literature Review

This section discusses the planning phase of the SLR. The research questions and review protocol are formulated to address the broad aim of investigating the apprehensions, realities, and skills necessary for the implementation of AI in Nigerian libraries. The specific objectives, posed as questions, are as follows:

- **RQ1:** To investigate the level of AI publications in Nigeria compared to other countries.
- **RQ2:** To examine the methodologies used in those publications.
- **RQ3:** To identify the apprehensions of librarians regarding the application of AI to library services.
- **RQ4:** To investigate the realities of AI applications in Nigerian libraries.
- **RQ5:** To determine the new skills required by librarians for the implementation of AI in Nigerian libraries.

Developing the Systematic Literature Protocol

This section explains how the search query was conducted and details the process for inclusion and exclusion criteria. An automatic search was conducted using both Google and Google Scholar with search terms such as "AI AND machine learning," "AI AND librarian apprehension," "AI AND libraries," "AI AND realities in the library," "AI AND new skills for librarians," and "AI AND its implementation in the libraries in Nigeria." Table 1 below shows the search strings.

Table 1. Search Strings

- AI AND machine learning
- AI AND librarian apprehension
- AI AND libraries
- AI AND realities in the library
- AI AND new skills for librarians
- AI AND its implementation in the

libraries in Nigeria

Conducting the Literature Review

This section details how the research protocol was followed, describing the process of identifying and selecting research papers. Eighty relevant papers were downloaded; 15 were removed as duplicates, and 14 were excluded for being written in another language. Finally, 51 research works were analyzed. Other criteria for inclusion were: clarity of objectives, whether the paper was research-based, explanation of the research process, achievement of objectives, and clarity of findings.

The Findings and Discussions of the Systematic Literature Review

Level of AI Publication in Nigeria Compared to Other Countries

Nigeria has the highest level of publication at 55% among the literature downloaded. This suggests that Nigeria is actively responding to the need for AI, reflecting a rapidly growing level of awareness. South Africa and Pakistan each contributed 6%, indicating that AI awareness in these regions is just beginning to grow, albeit at a lower level. China, Karnataka, and the USA each contributed 3.9%. The low level of publication in some countries may indicate that AI has already received sufficient attention and only a few researchers continue to write on the subject. Other countries, such as Malaysia, Indonesia, Srikakulam, India, Sri Lanka, Udgir, the UK, Tanzania, Kolkata, Bangalore, and Namakkal, each contributed 2%. Table 2 shows the level of AI publication in Nigeria compared to other countries.

Table 2: Level of AI Publication in Nigeria Compared to Other Countries

Countries	Number	Percentage
Nigeria	28	55
Malaysia	1	2
Indonesia	1	2
China	2	3.9
Srikakulam	1	2
India	1	2
Sri Lanka	1	2
Udgir	1	2
South Africa	3	6
Pakistan	3	6
UK	1	2
Tanzania	1	2
Karnataka	2	3.9
Kolkata	1	2
Bangalore	1	2
Namakkal	1	2
USA	2	3.9
Total	51	100

Methodology Used in AI Publications

The literature review constituted the largest portion of the methodologies used in the downloaded materials (63%), followed by the quantitative research approach (24%). The qualitative methodology was the least used (13%). Table 3 shows the methodologies used in the AI publications.

Table 3: Methodologies Used in AI Publications

Methodology	Number	Percentage
Literature Review	29	63
Qualitative Methodology	6	13
Quantitative Research Design	11	24
Total	46	100

Apprehensions of Librarians Regarding the Application of AI

Job Loss:

Some librarians in Nigeria are apprehensive about job displacement and the loss of personal interaction with users (Akiola, 2024). Others believe that AI implementation could threaten their jobs by replacing them. Korinek and Stiglitz (2017) noted that the adoption of AI can lead to significant job losses (Adolph, 2016). Lund et al. (2020) found that the majority of respondents were apprehensive that AI would result in job losses.

Lack of Finance:

Librarians in Nigeria believe that many libraries still struggle with basic operations due to a lack of funding, making it difficult to implement AI systems (Akiola, 2024). The cost of deploying AI technologies, staff training, hardware, and software is high and remains a burden on many institutions. Zhou (2023) noted that financial instability is a major concern, as libraries often experience budget cuts that prevent them from demonstrating their value. Meanwhile, the adoption of new technologies requires significant financial investment.

Lack of Interest:

Yakubu et al. (2023) argue that librarians' apprehension has led to a poor attitude towards the implementation of AI. Library personnel often exhibit reluctance to change and a protective attitude toward technological transformation (Zhou, 2023).

Realities of Artificial Intelligence

Time-Saving and Service Improvement:

Although librarians are apprehensive about AI implementation, its benefits outweigh the fears. Mumejakpor (2024) explains that AI will save librarians time, improve service management, and enhance user satisfaction. While AI depends on human input for optimal performance, the advantages far outweigh the challenges.

Transforming the Face of the Library:

Akinola (2023) stated that AI can transform library services, from how items are categorized and managed to how librarians and patrons interact, thereby increasing overall efficiency and effectiveness.

Revolutionizing Housekeeping Operations:

AI can revolutionize the organization of shelf

space, cataloguing, classification, serial management, collection development, and procurement in academic libraries, turning them into smart libraries (Oniovoghai, 2023). AI has the capacity to plan, learn, reason, make decisions, and solve problems on behalf of librarians, thereby enhancing user relationships with the library. Tools such as Research Rabbit, Scite, Elicit, and Open Read are examples of AI applications in this regard.

Cataloguing Automation:
AI assists in automating complex classification and organization tasks, thereby optimizing operational efficiency (Machado & Naik, 2024). It also improves the efficiency of fundamental tasks such as cataloguing, classification, and indexing (Biswas, 2024).

Collection Development:
AI can analyze data, identify popular resources, and suggest future demands, enabling librarians to make informed decisions about resource allocation and acquisitions (Campus & Librarian, 2023).

Provision of Services for People with Special Needs:
AI can provide alternative text formats, audio descriptions, and automatic translations for people with disabilities (Campus & Librarian, 2023).

New Skills for Librarians
Oyetola et al. (2023) explain that traditional roles are undergoing significant changes that require new skills and opportunities. Librarians must acquire new competencies to remain relevant and provide better services in the AI era (Zhou, 2023). Essential skills include:

- **Technical Ability:** Mastery of technical knowledge, such as natural language processing, knowledge graphs, computer vision, human-computer interaction, programming, and data analysis for effective library service and management.
- **Professional Ability:** Proficiency in information organization, retrieval, utilization, and effective communication and collaboration with experts.
- **Machine Learning and AI Basics:** A good grasp of algorithms, decision trees, neural networks, clustering, data presentation, model evaluation, and feature engineering (David-West & Cln, 2023).
- **Ethical Principles and Practices:** Familiarity with ethical considerations in AI. Libraries in Nigeria need to develop ethical standards and clear guidelines for AI use (Cox, 2024; Lo, 2023).

Conclusion
Publications from Nigeria accounted for 55% of the literature, indicating a high level of awareness about AI applications. Although many librarians are apprehensive about AI in library services, they recognize its necessity. Most research methodologies were literature reviews followed by quantitative approaches. However, librarians' apprehensions mainly revolve around fears of job loss and financial constraints, leading to a lack of interest in AI. Despite these apprehensions, the realities indicate that AI can save time, improve service delivery, transform library functions, automate cataloguing and collection development, and enhance services for people with special needs. To adapt to the AI era, librarians need both technical and professional skills, including knowledge of machine learning, AI basics, and ethical AI practices.

Recommendations
Based on the foregoing, the following recommendations are made:

1. **Stop Apprehending:** Librarians should stop fearing AI-induced job loss and embrace AI, as it is here to

stay—much like the computer revolution.

2. **Acquire New Skills:** Librarians need to acquire new skills that will enhance the implementation and application of AI in libraries. Library schools should improve their curricula to ensure that future librarians are well-equipped, and conferences and workshops should be organized for ongoing professional development.
3. **Focus on Realities:** AI will save time and transform library services. AI tools can make libraries more appealing and increase patronage.
4. **Increase Publications:** Although Nigeria shows a high level of publication (55%), many librarians are still unaware of AI and its benefits. Those who are aware should organize conferences and workshops to create further awareness.

Use Diverse Methodologies: While the most common methodology is a literature review followed by quantitative methods, qualitative approaches should also be employed, especially in institutions like the University of Lagos, to better understand the extent of AI application in libraries.

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