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Librarians' Readiness for Artificial Intelligence Integration in Nigerian Academic Libraries: A Review of Literature

The purpose of the article is to provide information professionals, including librarians, with a better understanding of the concepts and potential applications of artificial intelligence (AI) in library services. **Scientific novelty**. The article provides an overview of the literature on the readiness to implement artificial intelligence in library practice. It will go over the components of the Theory of Planned Behavior (TPB) model in connection with the management of library service delivery through AI tools. Lastly, a position on the preparedness of librarians for AI integration in university libraries will be adopted. **Conclusions**. The integration of artificial intelligence in Nigerian academic libraries is gaining momentum which has the potential to completely change how libraries function and provide services to their patrons. However, the readiness of librarians is crucial for successful implementation. This paper undertakes a review of the literature on how academic libraries in Nigeria are currently integrating AI and their readiness to use these tools. The results show that academic libraries in Nigeria are aware of the potential benefits of AI, but challenges like funding, infrastructure, and lack of expertise exist. To effectively use AI tools, librarians need to acquire new competencies and skills. Finally, the review offers suggestions for enhancing librarian readiness to fully exploit the potential of AI. In the Nigerian context, there is a notable scarcity of literature that has explored Librarians' readiness to the adoption of artificial intelligence in an academic library: a literature review analysis of the current scope and necessary skills and competencies needed through qualitative research. As such, this study stands as a significant contribution to expanding our understanding of the topic.

K e y w o r d s: artificial intelligence, academic libraries, librarians, Nigeria, readiness.

Relevance of the research topic. Libraries are not an exception to the global changes in life brought about by current technological advancements. Users of libraries are more compelled than ever before due to the deployment of several technologies that have had a significant impact on library services [23]. Academic libraries are establishments held within universities with the primary purpose of providing the institution with information derived from academic resources and community knowledge to support students' overall academic goals [23]. To maintain the academic objectives of their parent institutions of higher learning, academic libraries are tasked with collecting, organizing, conserving, and sharing knowledge-based materials [3].

However, given the sudden influx of information and the vast number of needs from keen users, they find it challenging to do so effectively [20]. This, however, necessitates the application of cutting-edge technologies, such as artificial intelligence (AI), to improve library operations and more successfully satisfy the needs of students and researchers. This change affects the whole industrial and educational landscape. AI is used in a wide range of industries worldwide [31]. In libraries, artificial intelligence has the potential to improve services and give patrons reliable information that will help them thrive in the information age.

One of the newest digital innovations is artificial intelligence, which academic libraries can use to its optimum potential to offer users a variety of more convenient library service options [5]. Numerous digital applications can now be updated, enhanced, and supplemented by artificial intelligence, giving these technologies some autonomy and reducing the need for human intervention [4]. Artificial intelligence has an impact on a wide range of fields, including but not limited to medicine and surgery, the automotive and aviation industries, commerce and industry, education, and other related disciplines. Thus, in light of its efforts to become widely used, academic libraries ought to make attempts to fully utilize its potential.

An overview of the literature on artificial intelligence preparedness will be provided in this article. It will go over the components of the Theory of Planned Behavior (TPB) model in connection with the management of library service delivery through AI tools. Lastly, a position on the preparedness of librarians for AI integration in university libraries will be adopted.

The purpose of the article is to provide information professionals, including librarians, with a better understanding of the concepts and potential applications of artificial intelligence in library services.

Presentation of the main research material. According to A. Tella [44], humanoid robots with methods, technological expertise and artificial intelligence (AI) in organizations are now accessible in libraries with resources like people and technology in both developed and developing countries. AI also covers the design, development, application, and use of robotics [1].

AI is essentially a machine that, with the assistance of a computer program, is capable of carrying out a complex range of tasks on its own. B. Kim [20] asserts that in libraries, humanoid robots can greet patrons and provide directions. Such duties are already carried out by the University of Pretoria Libraries in South Africa have a robot named Libby. F. Papy & C. Jakubowicz [36] assert that libraries are brimming with innovative programs that empower patrons and improve their ability to conduct research. Several professional associations in the field of robotic technologies have been recognized as having a role in library operations and librarianship by organizations like the South African Library Association, the American Library Association, and the International Federation of Library Associations and Institutions (IFLA). In the information age, the use of robots in libraries has the potential to enhance services and give patrons accurate information, both of which can foster growth and development [33]. The use of robotic technology in academic libraries was examined by M. Y. Ali et al. [4]. The study's findings showed that librarians' attitudes toward technology use in libraries were not favourable. The study's conclusions also showed that because they are ignorant of the advantages and challenges associated with integrating this technology into library systems, librarians and library managers find it challenging to potential cost savings that it could bring the library.

In a similar vein, O. A. Adebayo et al. [2] claimed that library managers will exhibit confidence in the adoption and application of AI when they are adequately informed about the necessity to use the technology to provide routine services. Whether or not AI technologies are appropriate for use in university libraries depends on several factors, including the availability of pertinent information, the need for policy documentation, the deployment of required software and algorithms, and, finally, subject-matter expertise [25]. In a study on Indonesian university libraries, A. Qomariyah et al. [39] enumerated the amenities needed for the effective use of robotic technology in university libraries. Documents relating to organizational resources, such as technological and human resources, technical know-how, and policies and procedures, are among them.

E. N. Decker [12] suggests that to ensure the successful implementation of robotic technologies in libraries, it is necessary to install a robust technological infrastructure, which includes a Wi-Fi connectivity zone. He continues by saying that there has to be

a written policy in place. Despite the enormous potential that artificial intelligence offers, academic libraries in Nigeria have not yet adopted this technology. The lack of studies relating AI and librarianship indicates that the importance of AI in libraries is not fully recognized or taken advantage of. Unlike other industries, the application of AI in library and information science has not grown at an exponential rate.

The challenges that libraries are currently facing seriously jeopardize their traditional role. At the moment, libraries are struggling with technological disadvantages, inefficiencies in their operations, difficulties bringing in new patrons and keeping hold of their current clientele, and a lack of ability to persuade stakeholders of the importance and advantages of libraries [34].

Current scope of application of AI in Nigerian Libraries. A. Tella [44] argues that to fully realize the potential of artificial intelligence, In the era of information, academic libraries need to raise the caliber of their services. Because of the faster access to information, the use in academic libraries will foster to delivery of better search and information services, which will excite both library staff and users. Thanks to the integration of artificial intelligence into library services, librarians are now able to complete a variety of tasks more quickly, including information retrieval, indexing, cataloguing, and reference. Speech recognition, machine translation, and library robots are a few of its uses. According to Tunde et al. (2022), the University of Lagos is the only institution in Nigeria that has used artificial intelligence AI in some library services and operations. Library professionals' awareness of the use of AI in libraries is still lacking.

In addition to shaping people's daily lives, new technologies have brought about a paradigm shift in all areas of life and altered global practices, according to CILIP [9]. There are major changes found in traditional roles that require new abilities, opportunities, and challenges. This new development has an impact on the general services offered, the roles of librarians, and the academic library environment of today. By conceptualizing and monitoring the field's advancements, Yusuf et al. (2021) evaluated the application of artificial intelligence for efficient library services in Nigerian academic libraries. The study backed up the advantages of integrating AI into library operations. These advantages include being easy to use, possessing a limitless number of features and functionalities, handling challenging tasks, etc. It also discussed the challenges such as a lack of funding, technical issues, job losses, etc. that library administration faces when implementing AI. The authors conclude that the application of artificial intelligence in information centres and libraries has set new benchmarks for providing effective and efficient services in libraries. Regrettably, academic libraries in developing nations tend to use AI technology insufficiently.

AI integration in the information business is expected to improve academic library services. AI can be applied in various fields, including robots, chatbots, machine learning, and automated storage and retrieval systems. Robots can perform tasks like pulling books off shelves and assisting with book loan reminders. Chatbots can also assist users in locating new items. Machine learning can be used for image identification and speech recognition, while robots can enhance collection analysis, visualization, preservation, and service delivery costs. Overall, AI technology is transforming library operations and enhancing library efficiency [14; 27]. This review's findings demonstrate how artificial intelligence can improve finding information, streamline tedious tasks, customize user interactions, and provide innovative services. Chatbots with artificial intelligence AI capabilities can quickly and effectively address customer inquiries and assist, thereby enhancing user satisfaction. Intelligent libraries with AI capabilities can provide users with efficient access to information by streamlining the cataloguing, classification, and recommendation processes.

The competencies and skills needed by library professionals to Optimse AI in Nigerian Libraries. Given that AI is transformative, libraries must be ready to take advantage of these new resources as the technology landscape shifts and adapt their services to meet evolving

societal needs. In light of this, librarians could benefit from having a deeper understanding of the technological environment. AI has the potential to drastically alter the nature of work in the industry, so employees may also need training to prepare for potential changes in their job responsibilities. Libraries can assist in bringing these initiatives to their local communities considering that they are a reliable and respectable source of information.

Digital literacy competencies, or the capacity to use technology meaningfully and safely, ethically, and legally, ranging from basic IT skills to creative abilities, are skills that librarians need to focus on developing. The development of algorithmic literacy, or the knowledge of how algorithms and other digital processes affect the way librarians access and utilize information, can involve extending these initiatives. Media and information literacy as well as personal data management abilities.

Artificial intelligence and librarians' preparedness. Academic librarians at Tehran University demonstrated an intense hatred for introducing AI technology into the library, according to M. Nakhoda & S.Tajik [30]. This resulted from a lack of understanding and training on the use of technology in library operations. According to B. Massis [26], the Adoption of RT is seen as risky by many academic librarians, who believe it will take tend to tasks that belong in their capacity as librarians. It should be noted, though, that integrating AI into libraries will improve the calibre of services they offer.

Similarly, S. Pinfield et al. [37] assert that if library managers understand how important it is to use RT to provide routine services, they will be willing to accept the use of robot technologies in libraries. Some research According to some research, libraries should create a continuing education program to equip staff and patrons with the knowledge and abilities needed for RT awareness, adoption, and use [5].

Additionally, Owolabi et al. [35] found that 98% of respondents knew AI was used in library operations. A. Tella [44] suggests university libraries must improve their offerings to benefit from AI. A survey found that 32.8% of respondents believed AI robots would lead to job loss and 23.9%) increased visibility. Some suggest establishing continuing education programs for AI awareness, adoption, and use.The survey surveyed academic librarians' views on AI, with 32.8% predicting job losses if AI robots were introduced in universities. On the other hand, 23.9% thought it would increase academic visibility. Remarkably, 15.4% thought it would strengthen librarians' skills. Nevertheless, 28% of respondents thought AI would improve the efficiency of library services patron satisfaction.

Advances in AI could result in job polarization or even job loss [8; 21; 29] asserts that automation and the application of AI could lead to a significant increase in inequality. According to C. B. Frey & M. A. Osborne [16], during the next 20 years, AI is expected to replace about 35% of workers in the UK and 47% of workers in the US. According to the World Bank (2016), because robot technologies are expected to result in a high rate of job losses, developing countries may be more reluctant to adopt them. According to the study, the use of AI will lead to the loss of 72% of jobs in Thailand and 77% of jobs in China. These studies all show how artificial intelligence can eliminate jobs and cause large job losses. Similarly, A. Asefeh & A. Asemi [6] provide a comprehensive list of applications for AI robot technologies that can be used to enhance a range of library services, such as item classification, book shelving, circulation, and more. AI is helpful for non-textual searches in addition to metadata assignments. According to E. N. Decker [12], establishing a robust WiFi connectivity zone and other necessary technology infrastructure is necessary to ensure the successful implementation of robotic technologies in libraries. He continues by saying that an official policy needs to be in place. Robotic technologies, such as RFID and barcodes, can reduce interactions between users and library staff, allowing for efficient library inventory [7].

Sambo, Imran, and Akanbi (2022) found that certified librarians face challenges in applying digital literacy skills, including power outages, lack of digital equipment,

excessive workload, and limited office time. They suggest the need for robotic applications like the Library Management Robot to address these issues. Libraries are implementing robotic systems to reduce labour and improve book organization. These systems, such as line-following robots and RFID and barcode technologies, can deliver books to users and inventory the library, addressing staffing issues and increasing efficiency [7; 24; 41].

To prepare university libraries for AI technologies, they must have a policy document, implement the required software and algorithms, have specialized expertise, and have a wealth of information [25]. In their research on Indonesian university libraries, A. Qomariyah et al. [39] enumerate the resources required for university libraries to successfully integrate AI technology. These consist of the organization's technical and human resources, policy and procedure documents, and the technological know-how required to operate the various tools. To implement artificial intelligence in university libraries, E. N. Decker [12] states that the administration of the library must install sufficient technological infrastructure, including a strong WiFi connection zone. He goes on to add that there must be policy documents in place.

Models of adoption of artificial intelligence. This study is grounded in and supported by the Theory of Planned Behavior (TPB), which identifies variables that may affect librarians' intentions to use AI tools to manage the provision of services in their libraries. A person's attitude, control behaviour, and subjective social norms all have an impact on his or her intention, which ultimately determines the behaviour that is displayed [11; 19; 42; 45] both provided evidence to support the claim that an individual's-initiated attitude primarily shapes their behaviour toward specific actions. Similarly, K. Arlitsch & B. Newell [5] emphasize that people's attitudes have a significant impact on the actions they take and have verified that attitudes affect the adoption of AI. Users' attitudes also indicate whether they believe a particular behaviour or action to be good or bad. According to V. Kumar et al. [22], several studies have confirmed the beneficial impact of attitude on the intention to adopt different types of technologies.

Conversely, perceived control behaviour which is defined as an individual's assessment of the ease or difficulty of executing the intended behaviour was employed as a significant predictor of users' intention to adopt [11]. A person's subjective perception of having control over a particular action or behaviour is measured by perceived control behaviour. According to research by M. S. S. Siqueira et al. [42] and R. J. Wolitski & N. H. Corby [45], users' intentions toward particular actions are positively influenced by their perception of control behaviour. Furthermore, G. Pourmand et al. [38] discovered that users' behaviour toward the adoption of innovations like artificial intelligence is greatly influenced by their perception of control over their behaviour. The focus of perceived control behaviour is equally on an individual's ability to successfully execute a particular behaviour. In a variety of scenarios, the intention to adopt technology has been well predicted by perceived control behaviour, as verified by V. Kumar et al. [22].

Conclusions. Nigerian university libraries are not fully prepared for the adoption of artificial intelligence (AI) in their operations. Despite the potential benefits, many librarians fear losing their jobs due to the technology. To ensure effective library services, librarians must retrain in AI skills, involve users, experiment with AI tools, and stay updated on AI developments. Attending conferences and training sessions can help prepare for the integration of AI. To promote AI adoption, libraries should encourage knowledge sharing and best practices, and draft policy documents to govern their use. Staff should receive training, and policy documents should be drafted. The management should also allocate funds for facilities and alternative power sources to support the efficient implementation of AI in Nigerian academic libraries.

In the Nigerian context, there is a notable scarcity of literature that has explored Librarians' readiness to the adoption of artificial intelligence in an academic library:

a literature review analysis of the current scope and necessary skills and competencies needed through qualitative research. As such, this study stands as a significant contribution to expanding our understanding of the topic.

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**ГОТОВНІСТЬ БІБЛІОТЕКАРІВ ДО ІНТЕГРАЦІЇ ШТУЧНОГО ІНТЕЛЕКТУ
В АКАДЕМІЧНІ БІБЛІОТЕКИ НІГЕРІЇ: ОГЛЯД ЛІТЕРАТУРИ**

Мета статті – надати інформаційним професіоналам, у тому числі бібліотекарям, краще розуміння концепцій і потенційних застосувань штучного інтелекту (ШІ) в бібліотечних послугах. **Наукова новизна**. У статті надано огляд літератури щодо готовності впровадження штучного інтелекту у бібліотечну практику. Вперше розглянуто компоненти моделі теорії запланованої поведінки у зв'язку з управлінням надання бібліотечних послуг за допомогою інструментів ШІ. Нарешті, буде прийнята позиція щодо готовності бібліотекарів до інтеграції ШІ в університетські бібліотеки. **Висновки.** Інтеграція штучного інтелекту в академічні бібліотеки Нігерії набирає обертів, що може повністю змінити те, як бібліотеки функціонують і надають послуги своїм відвідувачам. Однак для успішного впровадження вирішальне значення має готовність бібліотекарів. У статті зроблено огляд літератури про те, як наукові бібліотеки в Нігерії зараз інтегрують штучний інтелект та їхню готовність використовувати ці інструменти. Результати показують, що академічні бібліотеки в Нігерії знають про потенційні переваги штучного інтелекту, але існують такі проблеми, як фінансування, інфраструктура та брак досвіду. Щоб ефективно використовувати інструменти штучного інтелекту, бібліотекарям необхідно набути нових компетенцій і навичок. Нарешті, огляд містить пропозиції щодо підвищення готовності бібліотекарів до повного використання потенціалу ШІ. У нігерійському контексті існує значний дефіцит літератури, яка б досліджувала готовність бібліотекарів до впровадження штучного інтелекту в академічній бібліотеці: аналіз літературного огляду поточного обсягу та необхідних навичок і компетенцій, необхідних за допомогою якісного дослідження. Таким чином, це дослідження є значним внеском у розширення нашого розуміння теми.

К л ю ч о в і с л о в а: штучний інтелект (ШІ), наукові бібліотеки, бібліотекарі, Нігерія, готовність.

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