

Full Length Research

Awareness, Use and Benefits of Integration of Artificial Intelligence (AI) Tools in Library Services among Librarians in University Libraries in Nigeria

¹Festus A. Onifade, ²Bisi Balogun, ³John M Dosa & ⁴Abiola Jetawo

¹Olusegun Oke Library, Ladoko Akintola University of Technology, Ogbomoso, Oyo State, Nigeria.

^{1*}Corresponding author's E-mail:faonifade@lautech.edu.ng

²Agricultural and Rural Management Training Institute, (ARMTI) Ilorin. E-mail:bisibalogun@gmail.com

³Federal Polytechnic Library, Ile Oluji, Ondo State. E-mail: johdosa@fedpolel.edu.ng

⁴Nigerian Stored Products Research Institute, Ilorin. E-mail: publications@nspri.gov.ng

Accepted 28 April 2026

This study investigates the current state of integration of artificial intelligence tools into library services in university libraries in Nigeria. The study examines level of awareness of AI integration, types of AI tools currently use, benefits of AI integration to librarians and challenges faced by librarians for AI integration in university libraries. The study used quantitative method and descriptive research design, the questionnaire was used as instrument for data collection a total of 108 copies of the questionnaire were administered to three (3) universities in Oyo State. The findings of the study revealed the level of awareness of integration of AI, robots and thumb recognition technology were rated =3.12, types of AI are grammarly and quillbot =3.18, while the benefits 3.26, search capabilities and efficiency =3.14 respectively and challenges = 3.21. The study concludes that, integration of artificial intelligence (AI) tools in library services is vital towards enhancing the efficiency and effectiveness of university libraries in Nigeria. Recommends that, there is need for university libraries in Nigeria to invest in developing the infrastructure and organisations to share knowledge, expertise, and resources on the integration of AI tools emphasised on library service that meets the needs of students and faculty members in Nigerian universities.

Keywords: Integration, Artificial intelligence, Library Services, University, Libraries, Nigeria.

Cite This Article As: Onifade, F.A., Bisi, B., Dosa, J.M., Jetawo, A. (2026). Awareness, Use and Benefits of Integration of Artificial Intelligence (AI) Tools in Library Services among Librarians in University Libraries in Nigeria. Inter. J. Acad. Lib. Info. Sci. 14(3): 118-128

Introduction

Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, particularly computer systems. Sheikh, Prins, & Schrijvers, (2023). stated that AI include learning (acquiring data and rules for using the data), reasoning (using rules to reach conclusions), and self-correction. In the same vain Aminu, (2024). Emiri, (2023). And Afolayan, (2025) added that AI aims to create systems that can perform tasks that would normally require human intelligence, such as understanding natural language, recognizing patterns, problem-solving, and decision making. Machine Learning (ML) is a subset of AI that focuses on the development of algorithms and statistical models that enable computers to learn from and make predictions or decisions based on data, without being explicitly programmed for every

task Kersting, (2018). In other words, Soori et al (2022), stated that machine learning allows systems to automatically improve their performance with experience over time. ML techniques are widely used in applications such as recommendation systems, speech recognition, image classification, and data analytics.

Artificial Intelligence is defined as the simulations of human intelligence in computers that are trained to think and act like humans. The phrase can also refer to any machine that demonstrates human-like characteristics like learning and problem-solving Frankenfield, (2021). The major impact of AI integration shows its real significance on our society rather than in its technological exploits. What the application of AI seeks to achieve is to automate the tasks of human beings. Artificial intelligence in libraries represents a significant evolution from traditional methods of managing and disseminating information to more dynamic and interactive processes.

Libraries have historically been early adopters of technology, striving to enhance library services and reach broader users. Therefore, the integration of AI into library systems promises to further this mission by offering personalised service to users, automating repetitive tasks, and enhancing the accessibility and organisation of vast amounts of information Cox et al. (2020). Okunlaya, et al (2022). Libraries, as custodians of knowledge, are embracing this transformative wave, exploring AI's potential to revolutionise services and enhance user experiences. Artificial intelligence is widely spread and should be adopted and applied to the library. Since libraries are regarded as service-oriented organisations and their services have been transformed by advanced technologies in the modern era.

The tireless nature of AI systems ensures continuous library operation, freeing librarians from round-the-clock responsibilities (Omame, & Alex-Nmecha, 2020). AI-driven virtual reference assistants like Pixel or chatbots constructed using Hypertext Pre-processor (PHP) prove instrumental in delivering consistent and efficient uninterrupted services, catering for users' need for instant and personalised information Gujral, et al 2019). (Omame, & Alex-Nmecha, 2020). Libraries in developed countries, such as the University of Oklahoma Library in North America, Monash University Library in Australia, and San Jose State University Library in North America, are already successfully using these AI chatbots De Sarkar, (2023). However, in developing countries such as India, there are obstacles such as a lack of financial support and infrastructure that hinder the adoption and integration of chatbots in libraries Kaushal, & Yadav, (2022). In an era characterised by information overload, the role of AI in academic libraries becomes indispensable Hussain, (2023). AI technology's ability to analyse extensive metadata associated with scientific collections elevates indexing, reference services and information retrieval Allal, (2022). Ultimately, the integration of AI not only ensures accessibility and availability of library resources, but also equips library staff to adeptly navigate and harness AI's capabilities to address user inquiries Abayomi, et al. (2021)..Therefore, with whole lots of pros and cons of AI integration in library operation, this paper examines integration of artificial intelligence tools into library services among librarians in university library in Oyo state Nigeria, detailing the following constructs: level of awareness of AI integration among librarians, types of AI tools currently use, benefits of AI integration by librarians, and challenges faced by librarians for AI integration.

Statement of the Problem

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 library services. Libraries face with evolving challenges in managing vast amounts of information, providing efficient services, and ensuring a seamless user experience. However, the integration of artificial intelligence (AI) in academic libraries poses several challenges such as: high cost of implementation, data privacy issue, resistance to change training needs and technical issues among others. These challenges could potentially hinder the integration and implementation of AI into library services tailored to the specific needs of Nigerian students and other clienteles of academic libraries. On the basis of this, there is need to examine integration of artificial intelligence tools into library services among librarians in university library in Oyo state Nigeria.

Objectives of the study

The main objective of the study is to examine integration of artificial intelligence tools into library services among librarians in university library in Oyo state Nigeria. While specific objectives of the study are to:

1. examine level of awareness of AI integration among librarians in university libraries in Oyo state, Nigeria.
2. identify types of AI tools use by librarians in university libraries in Oyo state Nigeria.
3. ascertain benefits of AI integration by librarians in university libraries in Oyo state Nigeria.
4. find out challenges faced by librarians for AI integration in university libraries in Oyo state Nigeria.

Literature Review

Level of awareness of AI tools among Librarians

A study by Yu (2019), on artificial intelligence in academic libraries, a theoretical and empirical study opines that awareness of AI in academic libraries is crucial for enhancing and leveraging quality and efficiency in library services. Awareness of AI among librarians in academic libraries helps foster innovation and enables librarians to stay ahead of technological advancements. As noted by Singh, & Qazi, (2020). librarians who are aware of the latest development in AI can proactively adopt it and develop strategies to meet the emerging needs of their users and provide cutting-edge services. Harisanty et al (2022). explore the on awareness of artificial intelligence (AI) among leaders, practitioners, and scientists in Indonesian academic libraries. The research employs purposive sampling and thematic analysis to uncover eight critical themes related to AI, including understanding, adoption, benefits, competencies, and inhibiting factors. The findings revealed a positive and encouraging outlook on AI among library stakeholders, providing a solid foundation for AI initiatives in Indonesian libraries.

Researches have shown that the adoption AI in libraries and information centers are based on the awareness and perceptions of the LIS professionals in different societies. Moustapha, & Yusuf (2023). noted that libraries in Nigeria are struggling to adopt AI because of paucity of fund and technological defects, while the fear of job loss, reliability and authenticity of content and fear of privacy and confidentiality are the problems associated with the librarians' perceptions. However, Subaveerapandiyana, Sunanthini, & Anees (2023) claimed that LIS professionals in Zambia were aware of the skills required to adopt AI technologies. This spurred their eagerness and preparedness to take the lead role in adopting AI in libraries. The awareness and integration of AI for university libraries operations have been increasing across the globe.

Types of AI tools use in Nigerian University Libraries

Artificial intelligence tools and areas in which they can be applied in the library include: Robotic (taking library stock, shelving, searching, and retrieving information materials from shelves, check-in and check-out); Chatbot (acquisition, descriptive cataloguing, query services, library instructions, and information retrieval); Natural Language Processing NLP (knowledge management, book/information processing, classification of books, translation of text from native language, reading of information materials as well as information retrieval); Pattern Recognition (library material security, QR code of materials, image indexing and abstracting, user identification, RFID and security passwords); Image Processing (preservation and archival, managing library image and video databases, record scanning, and user facial recognition); Text Data Mining (citation support and analysis, OPAC searching, metadata, reference services, social media appearance and management).

Similarly, Jayachristayar, & Hemapriya (2023), identified some examples of artificial intelligence applications in libraries include chatbots, robots, virtual reality, natural language processing, semantic analysis, question- answering systems, and more. According to Adetayo (2023), artificial intelligence (AI) Chatbots, like ChatGPT, is becoming useful resources for academic libraries. They offer users convenient and accessible services outside of regular library hours, responding to their inquiries in a timely and accurate manner. Chatbots and virtual assistants with AI capabilities can also point users in the direction of pertinent resources and even help with research citations. AI integration into library services provides a very helpful expedient to apply this knowledge and generate superior results (Akinyemi,2024).

Benefits of AI integration among librarians in Universities libraries

AI has numerous benefits for academic libraries, including personalised resource recommendations, automated metadata creation and classification, predictive analytics for collection development, and efficient services through chatbots and virtual assistants. Other benefits include improved accessibility, plagiarism detection, citation verification and correction, enhanced security, fraud detection, and disaster preparedness. AI also offers tools for digital preservation, resource discovery, and natural language understanding while helping staff track user behaviors and improve customer service.

There is a growing interest in exploring the potential benefits of AI integration in libraries, particularly in enhancing user experiences and improving access to resources. The integration of artificial intelligence (AI) in libraries offers several benefits, including improved efficiency, accuracy, and user experience in library cataloguing, management, and operations Bisht, et al (2023). Bello, & Abdulsalam (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. Suhas, & Narayanrao, (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.

Suhas, & Narayanrao, (2023), investigate the uses and benefits of Artificial Intelligence in library management systems. With the ever-changing technological landscape, libraries increasingly implement AI to improve operations, user experiences, and resource usage. Other benefits of integration of AI into library services were managing extensive collections of books, journals, multimedia; digital content is a complex task. AI can streamline cataloguing processes, improve search functionalities, and even predict user needs based on past interactions. These advancements help create a more intuitive and efficient system that aligns with the evolving expectations of library patrons (Adewojo, & Dunmade, 2024). Jayavadivel, et al(2024). According to Mallikarjuna, (2024). academic libraries can benefit significantly from implementing AI technologies, revolutionising how they provide services and support for research and learning.

Challenges faced by librarians for AI integration in university libraries

Integration of artificial could also conduct a type of reference interview, replacing the current role of library professionals Mallikarjuna (2024). However, there are certain obstacles and restrictions to AI in libraries, including ethical issues, funding constraints, technical skills, user acceptance, and human computer interaction. According to Huang (2022), presents following issues facing integration of artificial intelligence in academic libraries, expensive of AI technology, data privacy and security, bias, training and expertise and user acceptance, according to Vijayakumar, & Sheshadri (2019), it was also believed that integration of artificial intelligence into library services were not without issues. Financial challenges are critical for implementing AI in library services. Often the inadequate infrastructure, so poor infrastructure will never support AI in library services Ajani et al (2022).

Resistance to change is an issue as some librarians are not interested in introducing new and innovative technologies. Some other challenges include poor networking, erratic power supply, lack of trained personnel, outdated technologies and economic factors and high cost of technological tools that should be addressed before implementing AI in library operations (Echedom, & Okuonghae, 2021). According to Tijani et al (2024), identified that data privacy and security, ethical concerns, staff training, cost and resource allocation as issues facing integration of artificial intelligence in university libraries. Also several challenges come with its acceptance, just as with other technologies. According to Yusuf et al (2022), these problems include the following: lack of finance, reluctance to accept new technology and developing skills gaps and fear of potential dangers from AI. Ogwo et al (2023). stated a number of factors working against the adoption of AI in university libraries such as poor ICT skills and technical expertise, financial constraints, phobia for job displacement, privacy and ethical issues, poor maintenance culture, epileptic power supply, poor network connectivity among others.

Another critical barrier is the skills gap among library staff. Implementing and managing AI technologies requires specialised technical knowledge that many librarians currently lack. This skills gap necessitates substantial investment in training and professional development to equip library staff with the necessary competencies. Workshops, courses, and certifications focused on AI and related technologies can help bridge this gap, but these initiatives also require time and financial resources Ayinde, & Kirkwood, (2020). Diseiye, et al (2024).

Research Method

This study adopted descriptive survey method to gather opinions of librarians in university libraries in Oyo State. The population consists of 108 librarians in three selected university libraries in Oyo State. This comprises 57 librarians from Kenneth Dike Library, University of Ibadan, 31 librarians from Olusegun Oke Library, Ladoke Akintola University of Technology, Ogbomoso Oyo state and 21 librarians from T.Y Danjuma Ajayi Crowther University, Oyo state. Census enumeration sampling technique was adopted in order to allow all the targeted population participate. A self-developed questionnaire divided into two major sections was used to collect data from the respondents. Section one focused on demographic information of the respondents, while other Sections was tailored towards answering the questions in the study. The questionnaire was administered to the respondents by two Research Assistants. Data collected was presented and analysed in frequency tables, percentages and mean.

Results and Discussion

One hundred and eight (108) questionnaires were administered for the study and one hundred and six (106) was returned analysed, interpreted and discussed below using (SPSS). The demographic information of the respondents is shown in the table 1. The demographic information contains gender, age, academic qualification, job status and years of experience.

Section A: Demographic Information of the Respondents

Table 1: Demographic Information

Demographic Information		Frequency	Percentage (%)
Gender	Male	56	52.8
	Female	50	47.2
Age range	25-35	30	28.3
	36-45	40	37.7
	46-56	35	33.0
	57-65	1	0.9
	65 and above	-	-
Academic Qualification:	Diploma	16	15.1
	BLIS	42	39.6
	MLIS	36	34.0
	PhD	10	9.4
	Others	2	1.9
Job status	Librarian	41	38.7
	Assistant Librarian	17	16.0
	Library Technician	39	36.8
	Library Officer	8	7.5
	Library Assistant	-	-
	Others	1	0.9
Years of experience	1-10	35	33.0
	11-20	39	36.8
	21-30	21	19.8
	30 and above	11	10.4
Total		106	100

Source: Author's Fieldwork, 2025.

The demographic information of the respondents is shown in the table 1. There are more male respondents (52.8%) than the female respondents (47.2%). The age distribution shows that most of the respondents are between 36 – 45 years (37.7%). Others are 46 – 56 years (33.0%), 25 – 35 years (28.3%) and 57 – 65 years (0.9%). The academic qualification shows that most of the respondents have BLIS as accounted for by 39.6%. The respondents with MLIS accounted for 34.0%. This was followed by the respondents with diploma accounting for 15.1% and PhD holders accounting for 9.4%. Other form of education accounted for 1.9%. The job status of the respondents in the library revealed that 38.7% of them are librarians. Others are library technicians (36.8%), assistant librarian (16.0%) and library officer (7.5%). The years of experience of the respondents showed that most of them have 11 – 20 years' work experience. This accounted for 36.8%. This was followed by 1 – 10 years (33.0%) and 21 – 30 years (19.8%). 10.4% of the respondents have 30years and above work experience.

SECTION B: Levels of awareness of AI integration among librarians in universities**RQ1: What levels of awareness of AI integration among librarians in universities**

The levels of awareness of AI integration among librarians to information library services delivery are shown in the table 2.

Table 2: Levels of awareness of AI integration among librarians in universities

S/N	Statement	Highly aware	Aware	Rarely aware	Not aware	Mean	SD
1.	I am aware of AI chatbots	35/33.0	54/50.9	8/7.5	9/8.5	3.08	0.863
2.	I am aware of AI Robots	36/34.0	50/47.2	17/16.0	3/2.8	3.12	0.77
3.	I am aware of thumb recognition technology	34/32.1	58/54.7	7/6.6	7/6.6	3.12	0.801
4.	I am aware of augmented reality (AR)	31/29.2	55/51.9	17/16.0	3/2.8	3.08	0.752
5.	I am aware of AI Expert Systems	30/28.3	54/50.9	16/15.1	6/5.7	3.02	0.816
6.	I am aware of Micromedex	29/27.4	59/55.7	15/14.2	3/2.8	3.08	0.726
7.	I am aware of Virtual References	32/30.2	49/46.2	21/19.8	4/3.8	3.03	0.810
8.	I am aware of face recognition technology	28/26.4	55/51.9	21/19.8	2/1.9	3.03	0.736
9.	I am aware of Virtual References	29/27.4	56/52.8	16/15.1	5/4.7	3.03	0.786
10.	I am aware of AI dynamed Systems	26/24.5	53/50.0	23/21.7	4/3.8	2.95	0.785

Source: Author's Fieldwork, 2025.

Table 2 examined the levels of awareness of AI integration among librarians. Based on the means and standard deviation, the awareness of integration of AI in different areas are rated as follows: AI Robots (M = 3.12; SD = 0.77), thumb recognition technology (M = 3.12; SD = 0.801), augmented reality (AR) (M = 3.08; SD = 0.752), AI chatbots (M = 3.08; SD = 0.726), Aware of Micromedex (M = 3.03; SD = 0.810), face recognition technology (M = 3.03; SD = 0.786), Aware of Virtual References (M = 3.03; SD = 0.810), Aware of AI Expert Systems (M = 3.02; SD = 0.816) and digital content management (M = 2.95; SD = 0.785).

SECTION C: Types of AI tools use by in university libraries among librarians**RQ2: what are types of AI tools use by in university libraries among librarians**

The types of AI tools use currently used by librarians for information services are given in table 3.

Table 3: Types of AI tools currently use by in university libraries among librarians

S/N	Types of AI tools	Strongly Agree F/%	Agree F/%	Disagree F/%	Strongly Disagree F/%	Mean	SD
1	Robotics	39/36.8	37/34.9	21/19.8	9/8.5	3.00	0.956
2	Virtual Reality	53/50.0	22/20.8	20/18.9	11/10.4	3.10	1.050

Continuation of Table 3

3	ChatGPT	48/45.3	26/24.5	25/23.6	7/6.6	3.08	0.977
4	Digital Reality	38/35.8	27/25.5	31/29.2	10/9.4	2.88	1.011
5	Internet of Things (IoT)	48/45.3	29/27.4	22/20.8	7/6.6	3.11	0.959
6	Big data	40/37.7	24/22.6	34/32.1	8/7.5	2.91	1.000
7	Cloud Computing	34/32.1	29/27.4	34/32.1	9/8.5	2.83	0.980
8	RFID Technology	41/38.7	36/34.0	27/25.5	2/1.9	3.09	0.845
9	Chatbot	36/34.0	39/36.8	25/23.6	6/5.7	2.99	0.900
10	Grammarly and QuillBot	50/47.2	29/27.4	23/21.7	4/3.8	3.18	0.903

Source: Author's Fieldwork, 2025.

The usability of the digital tools is rated using their means and standard deviation. These digital tools are rated from the highest to the lowest as follows: Grammarly and QuillBot (M = 3.18; SD = 0.903), Internet of Things (IoT) (M = 3.11; SD = 0.959), virtual reality (M = 3.10 SD = 1.050), RFID technology (M = 3.09; SD = 0.845), ChatGPT (M = 3.08; SD = 0.977), robotics (M = 3.00; SD = 0.956), Chatbot (M = 2.99; SD = 0.900), Big data (M = 2.91; SD = 1.000), digital reality (M = 2.88; SD = 1.011) and cloud computing (M = 2.83; SD = 0.980).

SECTION D: Challenges faced by librarians for AI integration in university libraries**RQ 3: What are challenges faced by librarians for AI integration in university libraries**

The challenges facing library professionals in integrating AI are given in the table 4.

Table 4: Challenges facing library professionals in adopting AI

S/N	Challenges	Strongly Agree F/%	Agree F/%	Disagree F/%	Strongly Disagree F/%	Mean	SD
1	Lack of Training and Capacity Building	38/35.8	46/43.4	12/11.3	10/9.4	3.06	0.924
2	Limited Infrastructure and Resources	33/31.1	50/47.2	17/16.0	6/5.7	3.04	0.839
3	Funding Constraints	36/34.0	52/49.1	14/13.2	4/3.8	3.13	0.782
4	Resistance to Change and Technophobia	40/37.7	52/49.1	10/9.4	1/3.8	3.21	0.765
5	Implementation of AI technologies	30/28.3	55/51.9	17/16.0	4/3.8	3.05	0.773
6	Cost of Maintenance	36/34.0	56/52.8	10/9.4	4/3.8	3.17	0.749
7	Lack of Professionals expertise	38/35.8	44/41.5	16/15.1	8/7.5	3.06	0.903
8	Phobia for Job Displacement	31/29.2	59/55.7	7/6.6	9/8.5	3.06	0.838
9	Poor Network Connectivity	36/34.0	50/47.2	14/13.2	6/5.7	3.09	0.834
10	Privacy and Ethical issues	37/34.9	52/49.1	10/9.4	7/6.6	3.12	0.836

Source: Author's Fieldwork, 2025.

Table 4 showed the challenges facing library professionals in adopting AI. The challenges facing library professional in adopting AI are rated using their means and standard deviation. From the highest to the lowest, the challenges are: resistance to change and technophobia (M = 3.21; SD = 0.765), cost of maintenance (M = 3.17; SD = 0.749), funding constraints (M = 3.13; SD = 0.782), privacy and ethical issues (M = 3.12; SD = 0.836), poor network connectivity (M = 3.09; SD = 0.834), lack of training and capacity building (M = 3.06; SD = 0.924), lack of professional expertise (M = 3.06; SD = 0.903), phobia for job displacement (M = 3.06; SD = 0.838), implementation of AI technologies (M = 3.05; SD = 0.773) and limited infrastructure and resources (M = 3.04; SD = 0.839).

SECTION E: Benefits of AI integration by librarians in university libraries**RQ: what are benefits of AI integration by librarians in university libraries**

The benefits of AI to information services delivery are given in the table 5.

Table 5: Benefits of AI integration by librarians in university libraries

S/N	Statement	Strongly Agree F/%	Agree F/%	Disagree F/%	Strongly Disagree F/%	Mean	SD
1	Boost Research Productivity	44/41.5	52/49.1	4/3.8	6/5.7	3.26	0.784
2	Improve the Search Capabilities	38/35.8	52/49.1	9/8.5	7/6.6	3.14	0.833
3	Rendering of Services just in Time	35/33.0	58/54.7	4/3.8	9/8.5	3.12	0.836
4	Bridge in Space	35/33.0	51/48.1	12/11.3	8/7.5	3.07	0.865
5	Efficiency in Library Operation	37/34.9	55/51.9	6/5.7	8/7.5	3.14	0.833
6	Elimination of Human Errors in Library	37/34.9	50/47.2	11/10.4	8/7.5	3.09	0.868
7	Enhance Library Service Delivery	36/34.0	52/49.1	10/9.4	8/7.5	3.09	0.857
8	Reducing Expenses Associated with Service Delivery	41/38.7	46/43.4	11/10.4	8/7.5	3.13	0.885
9	Collection and Analysis Data for Decision Making	33/31.1	54/50.9	10/9.4	9/8.5	3.05	0.866
10	Enhancing Users Satisfaction Increases users' Knowledge	30/28.3	50/47.2	14/13.2	12/11.3	2.92	0.933

Source: Author's Fieldwork, 2025.

Table 5 showed the benefits of AI to information services delivery. From the highest to the lowest, the benefits of AI to information services delivery as rated through their means and standard deviation are: boost research productivity (M = 3.26; SD = 0.784), improve the search capabilities (M = 3.14; SD = 0.833), efficiency in library operations (M = 3.14; SD = 0.833), reducing expenses associated with service delivery (M = 3.13; SD = 0.885), rendering services just in time (M = 3.12; SD = 0.836), elimination of human errors in library (M = 3.09; SD = 0.868), enhance library service delivery (M = 3.09; SD = 0.857), bridge in space (M = 3.07; SD = 0.838), collection and analysis data for decision making (M = 3.05; SD = 0.773) and enhancing users satisfaction and increase in users' knowledge (M = 3.04; SD = 0.839).

Discussion of the findings

The level of awareness of AI integration among librarians to information library services delivery, the findings of the study revealed that, awareness of AI integration among librarians include AI Robots, AI chatbots, thumb recognition technology, aware of augmented reality (AR) Aware of AI Expert Systems, Aware of Micromedex, and Aware of face recognition technology. This corroborated with the thought of [3] that awareness of AI as the understanding and recognition of the capabilities and potential impact of AI technologies or tools on library operations and services.

On the aspect of types of AI tools used among librarians in Nigerian universities library include robotics, virtual reality, ChatGPT, digital reality, Internet of Things (IoT), Big data, cloud computing, RFID technology, chatbot, Grammarly and QuillBot. This is supported by findings of [22] who identified some examples of Artificial Intelligence applications in libraries include chatbots, robots, virtual reality, natural language processing, semantic analysis, question- answering systems, and more.

On the aspect of benefits of AI integration, the findings revealed that some of the benefits considered include: boost in research productivity, rendering of services just in time, efficiency in library operations, elimination of human errors in

library and reduction in the expenses associated with service delivery. This aligned with [25] that the integration of artificial intelligence (AI) in libraries offers several benefits, including improved efficiency, accuracy, and user experience in library cataloguing, management, and operations.

The study revealed findings on challenges of integrating AI to include lack of training and capacity building, limited infrastructure and resources, funding constrains, implementation of AI technologies, cost of maintenance, privacy and ethical issues among others. This is in agreement with the findings of [31] presents following barriers, AI expensive, data privacy and security, bias, training and expertise and user acceptance.

Conclusion

The integration of Artificial Intelligence (AI) tools in library services is a vital step towards enhancing the efficiency and effectiveness of university libraries in Nigeria. But its seamless and prudent integration and implementation in libraries hinged of many factors. This study reveals that chatbots, robots, thumb recognition and face recognition technology respectively are the major AI tools librarians in university libraries. However, the study itemised few benefits of integration of AI tools in university libraries as to boost in research productivity, rendering of services just in time, efficiency in library operations. Hence, it makes librarians perceived provision of patron-tailored recommendations to items, reduces manual and repetitive tasks performed by librarians and facilitates the discovery of new knowledge in university libraries. However, it is difficult to integrate and implement AI tools in university libraries because of resistance to change and technophobia, cost of maintenance, funding constraints, privacy and ethical issues, poor network connectivity, lack of training and capacity building, lack of professional expertise, phobia for job displacement among librarians.

Recommendations

Based on the findings of the study the following recommendations were made:

1. University libraries in Nigeria should provide regular training and development opportunities for librarians to acquire the necessary skills and knowledge to effectively integrate AI tools into their services.
2. There is need for University libraries in Nigeria to invest in developing the necessary infrastructure, such as computers, software, and internet connectivity, to support the integration of AI tools.
3. University libraries in Nigeria should collaborate and partner with other libraries, institutions, and organisations to share knowledge, expertise, and resources on the integration of AI tools.
4. University libraries in Nigeria should develop policies and guidelines to govern the integration of AI tools into their services, including issues related to data privacy, security, and intellectual property.

References

- Abayomi, O. Adenekan, F. Abayomi, A. Olateju, A. & Aderonke, A. (2021). Awareness and perception of the artificial intelligence in the management of university libraries in Nigeria. *Journal of Interlibrary Loan, Document Delivery and Electronic Reserve*, 29(1&2): 13-28.
- Adetayo, A. (2023). Artificial intelligence chatbots in academic libraries: The rise of ChatGPT. *Library Hi Tech News*, 40(3), 18–21. <https://doi.org/10.1108/LHTN-01-2023-0007>
- Adewojo, A. A., & Dunmade, A. O. (2024). From big data to intelligent libraries: Leveraging analytics for enhanced user experiences. *Business Information Review*.doi:10.1177/02663821241264707.
- Afolayan, O., T. (2025). "Drivers and Impediments in the Adoption of Artificial Intelligence by Academic Libraries in Nigeria". *Library Philosophy and Practice (e-journal)*. 8263. <https://digitalcommons.unl.edu/libphilprac/8263>
- Ajani, Y. Tella, A. Salawu, K. & Abdullahi, F. (2022). Perspectives of librarians on awareness and readiness of academic libraries to integrate artificial intelligence for library operations and services in Nigeria, *Internet Reference Services Quarterly*,26. (4),1-18.
- Akinyemi, O (2024). Enhancing Academic Library Service Delivery Using Artificial Intelligence (AI) Library Philosophy and Practice (e-journal). 8042. <https://digitalcommons.unl.edu/libphilprac/8042>
- Allal, M. (2022). Artificial intelligence as a support for librarians who buy scientific documents: what factor do they take into account? *Journal of Positive School Psychology*, 6(5): 8765-8782.\
- Aminu, M. B. (2024). Adoption of Artificial Intelligence for Library Operations in Federal University Libraries in North West States of Nigeria. *BW Academic Journal*, 1(3), 88– 93. <https://www.bwjjournal.org/index.php/bsjournal/article/view/2135>
- Ayinde, L. & Kirkwood, H. (2020). Rethinking the roles and skills of information professionals in the 4th Industrial Revolution. *Business Information Review*, 37(4),142–153. doi: 10.1177/0266382120968057.

- Bello, H. & Abdulsalam, Z. (2023). Steps to Improving Library Services through Artificial Intelligence in Nigerian Libraries. *Lokoja Journal of Information Science Research*, 1(2), 86–96. <https://ljisr.net.ng/index.php/lis/article/view/21>
- Bisht, S., Nautiyal, A., Sharma, S., Sati, M., Bathla, N., & Singh, P. (2023). The role of Artificial Intelligence in shaping Library Management and its Utilization. 2023 International Conference on Disruptive Technologies (ICDT), 467–472. <https://doi.org/10.1109/ICDT57929.2023.10150520>
- Cox, A. M., Pinfield, S., & Rutter, S. (2020). The intelligent library: Thought leaders' views on the likely impact of artificial intelligence on academic libraries. *Library Hi Tech*, 38(2), 418-435. <https://doi.org/10.1108/LHT-08-2019-0178>
- De Sarkar, T. (2023). Implementing robotics in library services. *Library Hi Tech News*, 40(1): 8-12.
- Diseiye, O., Ukubeyinje, E., Oladokun, B., & Kakwagh, V., (2024). Emerging technologies: Leveraging digital literacy for self-sufficiency among library professionals. *Metaverse Basic and Applied Research*, 3, 59–59. doi:10.56294/mr202459
- Echedom, A.U. and Okuonghae, O. (2021), "Transforming academic library operations in Africa with artificial intelligence: opportunities and challenges: a review paper", *New Review of Academic Librarianship*, 27 (2), 243-255
- Emiri, O. T. (2023). Adoption and Utilisation of Artificial Intelligence by Librarians in University Libraries in Southern Nigeria. *Library Philosophy and Practice (e-journal)*. 7570. <https://digitalcommons.unl.edu/libphilprac/7570>
- Frankenfield, J. (2021). What is artificial intelligence (AI)? *Alternative Investment*. <https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp>.
- Gujral, G., Shivarama, J. & Choukimath, P. (2019). Perceptions and prospects of artificial intelligence technologies for academic libraries: an overview of global trends. 12th International CALIBER, 79-88.
- Harisanty, D., Anna, N. Putri, T, Firdaus, A. & Noor Azizi, N. (2022). Leaders, practitioners and scientist's awareness of artificial intelligence in libraries: a pilot study. *Library Hi Tech*, ahead-of-print). <https://doi.org/10.1108/LHT-10-2021-0356>
- Huang, Y.H. (2022) Exploring the implementation of artificial intelligence applications among academic libraries in Taiwan. *Library Hi Tech*, doi: 10.1108/lht-10-2021-0259.
- Hussain, A. (2023). Use of artificial intelligence in the library services: prospects and challenges. *Library Hi Tech News*, 40(2): 15-17.
- Jayachristayar, S & Hemapriyaa, S (2023) Transforming Libraries: Applications of Artificial Intelligence in Library Services; *Gyankosh Journal of Library and Information Management*; 14 (1 & 2)
- Jayavadeivel, R., Arunachalam, M., Nagarajan, G., Shankar, B., Viji, C., Rajkumar, N & Senthilkumar, K., (2024). Historical overview of AI adoption in libraries. In *AI assisted library reconstruction*. 267–289). IGI Global. doi: 10.4018/979-8-3693-2782.
- Kaushal, V. & Yadav, R., (2022) The role of chatbots in academic libraries: an experience based perspective. *Journal of the Australian Library and Information Association*, 71(3): 215-232.
- Kersting K. (2018) Machine Learning and Artificial Intelligence: Two Fellow Travelers on the Quest for Intelligent Behavior in Machines. *Front Big Data*. 2018 Nov 19; 1:6 doi:10.3389/fdata.2018.00006. PMID: 33693322; PMCID: PMC7931929.
- Mallikarjuna, C., (2024). An Analysis of Integrating Artificial Intelligence in Academic Libraries; *Journal of Library and Information Technology*, 44(2), 124-129, DOI:10.14429/djlit.44.02.18958
- Moustapha, A.A. & Yusuf, I.O. (2023). Adoption of artificial intelligence to improve library service delivery in academic libraries in Kwara State, Nigeria. *Library Philosophy and Practice* 7915. <https://digitalcommons.unl.edu/libphilprac/7915>
- Ogwo, U., Ibegbulem, F.; & Nwachukwu, V., (2023). Applications and Perceived Impact of Artificial Intelligence in University libraries in Nigeria. *Library Philosophy and Practice* <https://digitalcommons.unl.edu/libphilprac/7907>
- Okunlaya, R. O., Syed Abdullah, N., & Alias, R., (2022). Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. *Library Hi Tech*, 40(6), 1869–1892. doi: 10.1108/LHT-07-2021-0242.
- Oname, I.M., & Alex-Nmecha, J.C., (2020). Artificial intelligence in libraries. In Osuigwe, N.E.(ed.). *Managing and adapting library information services for future users*. Hershey, PA:IGI Global: 120-144
- Sheikh, H., Prins, C., Schrijvers, E. (2023). Artificial Intelligence: Definition and Background. In: *Mission AI. Research for Policy*. Springer, Cham. https://doi.org/10.1007/978-3-031-21448-6_2
- Singh, A. & Qazi, R. (2020). Artificial Intelligence in Academic Libraries: Opportunities and Challenges. *Journal of library and information technology*, 40(2), 96-102
- Soori, M., Arezoo, B., & Dastres, R. (2022). Artificial intelligence, machine learning and deep learning in advanced robotics, a review. *Cognitive Robotics*, 3, 54-70. <https://doi.org/10.1016/j.cogr.2023.04.00>

- Subaveerapandiyan, A., Sunanthini, C. & Amees, M. (2023). A study on the knowledge and perception of artificial intelligence. *International Federation of Library Associations and Institutions*, 49(3), 503–513. <https://doi.org/10.1177/03400352231180230>
- Suhas, D., & Narayanrao, S., (2023). The Use of Artificial Intelligence in Library Management. *Journal of Emerging Technologies and Innovative Research*.10(6), 122– 123
- Tijani L.T., Kingsley.O., Nkapia, S., Frieda, L., Esievo, O., Obande. B. & Ado M., (2024). Artificial Intelligence in Academic Libraries and its Impact on Library Services and Operation. *Journal of. Library & Information Science*. (1) 53-61.
- Vijayakumar, S.& Sheshadri, K., (2019). Applications of artificial intelligence in academic libraries”, *International Journal of Computer Sciences and Engineering*, 7, 23-47
- Yu, K., (2019). The Application of Artificial Intelligence in Smart Library. *Conference Proceedings of the International Conference on Organizational Innovation* (ICOI2019).https://www.researchgate.net/publication/336975413_The_Application_of_Artificial_Intelligence_in_Smart_Library
- Yusuf, T. I., Adebayo, O. A., Bello L A., & Kayode, J. O., (2022). Adoption of artificial intelligence for effective library service delivery in academic libraries in Nigeria. *Library Philosophy and Practice*, (7), 45-63.<https://digitalcommons.unl.edu/libphilprac/6804>