

Perceived awareness and usefulness of artificial intelligence technology for efficient library operations in university libraries in Kwara State, Nigeria

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Abstract

The integration of artificial intelligence technology in academic libraries has immensely elevated the image of their operations and services to users. This study investigates the perceived awareness and usefulness of artificial intelligence technology for library operations in Kwara State academic libraries. Descriptive survey design was adopted for this study and the population consisted of 108 librarians and paraprofessionals in all university libraries in Kwara State which are University of Ilorin, Kwara State university Malete, Al Hikmah University, Ojaja , University, Eyenkorin, Landmark University, Omu Aran, and Ahmad Pategi University, Patigi. A total enumeration technique was employed and questionnaire was used to collect data from the respondents. Data collected were analysed with frequency counts and simple percentages. Findings revealed that AI Robots, AI chatbots, face recognition technology, virtual references, Humanoids, Dynamed and AI expert systems are the AI technologies the respondents were highly aware of. The respondents perceived the usefulness of AI technologies for efficient library operations such as AI chatbots can be useful for reference services, AI can be used for cataloguing and classification of library materials, AI drone surveillance can be used for library security, AI expert search tools for information search, AI can be useful for automating library routines. The findings also revealed the challenges of artificial intelligence technology integration to library operations to include potential loss of job, high risk of maintenance, inadequate internet service provision, technical problems, epileptic electricity or power supply, and inadequate ICT facilities for AI technologies. This study concluded that the librarians in university libraries in Kwara State are aware of AI technology and perceived the usefulness of its integration to library operations. It also recommends that AI technologies such as robots, chatbots, and expert systems should be integrated to libraries in order to provide top-notch services to their users.

Keywords: Perceived awareness, perceived usefulness, artificial intelligence technology, academic libraries, efficient library operations.

Introduction

In this era of unprecedented advancements in technology, the integration of these technologies in library operations has revolutionized traditional practices, enabling libraries to adapt to the evolving needs of users in the digital age. The relevance of technologies embedded services and their application among librarians is to make them more effective in the delivery of various library operations (Agbo & Eyinnah, 2022). Adequate provision of technology

facilities in academic libraries will revolutionize effective information service delivery (Adeniran; Nwalo & Ajani, 2020) The further stated that the advancement in the use of technology in day-to-day operations of academic libraries will dramatically enhanced information provision to the library users.

The integration of artificial intelligence (AI) technology stands out as a transformative force across various sectors such as healthcare, finance, education, entertainment and information

institution university libraries, as essential hubs of information and knowledge, have not remained untouched by this wave of innovation. The intersection of AI and library operations heralds a new chapter in the evolution of these vital technologies, promising enhanced efficiency, accessibility, and user experiences. AI is defined as the simulation 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).

Artificial intelligence (AI) is a branch of computer science and engineering that focuses on developing intelligent machines that can perform tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation. University libraries needs to re-position themselves to take the relative advantages of artificial intelligence's potentials by refining the quality of library services in this era of the information explosive age (Tella, 2020). AI seems to be the new hope for university libraries to provide more of advanced automated services to their users as it is one of the technologies that has arisen and will play a major role in the 5th Industrial Revolution (Memela, 2023).

Furthermore, the integration of AI for library operations is not merely a technological advancement to university libraries. It represents a strategic response to the changing expectations and behaviors of library users in the digital age. Libraries in the developed countries have accepted and use AI technologies for their operations and services virtually in all spheres of life whereas those in developing countries are still struggling to find their feet (Tella, 2020). The use AI in university libraries will make the library more

relevant in the academic community. University libraries' patrons would be more excited to come to the library and see the library as a real center of knowledge (Owolabi et al., 2021).

Artificial intelligence integration in university libraries operations offers numerous benefits and advantages. "AI innovations in the library will increase academic librarians' job performance and better user satisfaction." Highlighted by Owolabi et al., (2021) as one of the various advantages of using AI in library operations. AI is being used to guide and support library activities and operations, and at the same time user-friendly, particularly in information search among other benefits derived from the adoption AI in libraries (Yusuf et al., 2022). AI has the ability to streamline library operations, increase librarian productivity, and encourage the provision of high-quality services to the next generation of library patrons (Olusegun et al., 2023).

However, despite all the numerous benefits of AI for academic library operations, there are some disadvantages it comes with which are not be overlooked. Subaveerapandiyana, Sunanthini and Ameen (2023) opined that AI is still in its early stages of development, and many challenges need to be addressed before it can be fully integrated into libraries and information services. These challenges include privacy, security and ethical considerations. Yusuf et al., (2022) in their own study, they concludes that in spite of the benefits associated with the adoption of AI in libraries, some challenges such as financial uncertainty, emerging skill gaps, job loss, lack of adequate infrastructure and erratic power supply still hinder the smooth adoption of AI in many university libraries in Africa.

Hence, having observed the developing trends in AI technologies and its integration to library operations

globally, there is the need for such innovations in Nigeria, especially in university libraries so as to reap the overwhelming merits of AI for efficient library operations. It is to note that University of Lagos is currently the only institution in Nigeria that has adopted the use of AI in some library services and operations according to Yusuf et al. (2022). Therefore, this study investigated perceived awareness and usefulness of artificial intelligence technology for efficient library operations in Kwara State university libraries.

Research Questions

The following research questions were generated to guide this study:

1. What is the perceived awareness of AI technology for efficient library operations in Kwara State university libraries?
2. What is the perceived usefulness of AI technology for efficient library operations in Kwara State university libraries?
3. What are the challenges of AI technology integration for efficient library operations in Kwara State university libraries?

Literature review

University libraries play pivotal role for efficient teaching, learning and research for their parent institutions. University libraries support the realization of the missions and visions of their parent institutions. University libraries have various users such as students, lecturers, researchers, faculty members and the host community. It is paramount for university libraries to acquire information materials across the curriculum of their institutions in order to support the teaching, learning and research. According to Ilori and Owolabi (2020), it is imperative for university libraries to acquire, process,

store, preserve and disseminate information resources that meet users' needs.

Recent advancement in digital technology have significantly changed how traditional library operation is done. University libraries all around the world have integrated and incorporated technology into all of their internal operations, services and activities, and developing nations like Nigeria are not falling behind in this race. In order for university libraries to be able to provide user-satisfactory services, they must evolve by responding to changes from time to time (Ilori & Owolabi, 2020). Hervieux and Wheatley (2021) stated that librarians and information practitioners have historically responded to new technological advancements that provide advances in their profession. AI is one of the recent technological advancement that have caused a significant presence to the operations and services of university libraries. The application of AI in libraries is not only the result of the development of technology, but also the choice of libraries to improve their service (Tang & Zhang, 2023)

The awareness and integration of AI for university libraries operations have been increasing across the globe. Many university libraries recognize the potential benefits of AI to improve efficiency, enhance user services, and support research activities. Owolabi et al., (2021) revealed in their study that academic librarians are aware of AI technologies, particularly in library operations. Mahmoud (2023) asserted that it has become necessary for university libraries to introduce and exploit artificial intelligence in their operations and services. Sambo and Oyovwe-Tinuoye (2023) in their study, they discovered that the majority of licenced librarians were

averagely aware of AI robotic technologies in libraries. .

The AI revolution in libraries is expected to have a significant impact on a number of areas, including data processing, literacy, and online and virtual services (Winkler & Kiszl, 2021). Eiriemiokhale and Sulyman (2023) stated that librarians perceived AI as a positive technological advancement that can be used to perform some tasks initially perform by librarians. Several academic librarians see the introduction of AI as an excellent innovation to library practices. AI-driven chatbots and virtual assistants provide instant support to library users. They can answer queries, assist with navigation, and offer information about library resources and services (Owolabi et al., 2021). Frequently and appropriate use of AI has been realized as the most effective next solution to handle such difficulties in libraries (Hayani et al., 2021).

The primary objective of AI technologies for library operations is to augment and streamline various facets activities of the library. Ranging from the automation of technical tasks such as cataloguing and classification to the facilitation of sophisticated search capabilities and the provision of personalized recommendations. Corrado (2021) stated that artificial intelligence can be applied in many areas of technical services, such as assigning and creating subject headings, taxonomies, and metadata descriptions. Similarly, Asefeh and Asemi (2018) list various ways in which AI technologies can be used to improve library services such as circulation services, shelving of books, cataloguing of library materials, among others.

AI holds the promise of revolutionizing the way libraries functions. Moreover, the integration of AI is not

merely a technological upgrade; it represents a strategic response to the changing expectations and behaviors of library users in the digital age. Oladokun et al. (2023) stated that AI robot adoption and use in libraries can enhance library services and give users with reliable information that can foster growth and development in the information age. This is similar to a study by Moustapha and Yusuf (2023) they stated that robots, humanoid, facial recognition software, drones, chatbots, thumb recognition, and other types of artificial intelligence (AI) are becoming more popular and can be used in library services. Kim (2017) claims that humanoid robots can welcome guests and give directions in libraries. For instance, Libby, a robot at the University of Pretoria Libraries in South Africa, already performs such tasks.

AI technologies can facilitate text and data mining, helping researchers and students extract valuable insights from large volumes of academic literature. It can support various research activities and aid in knowledge discovery. Sivarajah et al. (2017) stated that using AI in university libraries allows for better analysis of datasets, especially large datasets used for analysis across multiple datasets. It also helps to eliminate repetitive and tedious tasks. Mughali (2019) researched on how AI can be used in libraries. The results showed that AI can be used for expert systems in libraries, such as Refsearch, indexes, online reference help, and Plexus Expert, which have also proven useful in performing tasks related to acquisition, classification, cataloguing, and other library procedures. University libraries needs to reposition themselves to take use of the potentials of artificial intelligence by improving the quality of library services in this information age (Tella, 2020).

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AI-driven voice recognition systems can enable users to interact with library services using voice commands. This hands-free approach can simplify tasks such as searching for resources or checking collection status. Natural Language Processing may be utilized in libraries to create intelligent expert information retrieval systems that users can engage with directly using natural language (Oname & Alex-Nmecha, 2020). AI systems can send automated alerts and notifications to users about due dates, holds, and the availability of requested materials. This helps users stay informed and engaged with library services. AI is one of the most recent digital transformations that university libraries can unlock its potentials to provide patrons with varying library service alternatives more conveniently (Arlitsch & Newell, 2017).

The usefulness of AI for university libraries operations has the potential to transform traditional library services, making them more efficient, user-friendly, and responsive to the evolving needs of academic communities. AI improves libraries' operational efficiency by optimizing collection analysis, visualization, cataloguing, preservation, and reducing the expenses associated with service delivery (Tella, 2020). AI is characterised as the technology that enables machines to be able to have the abilities to plan, learn, reason, solve problems, move and be creative to some extent (Mamela, 2023). Yusuf et al. (2022) stated that using artificial intelligence in libraries and information centers is setting new benchmarks for providing effective and efficient services in libraries.

Vysakh and Babu (2020) looked at the deployment of automated AI in libraries. The findings suggested that robots can execute the majority of the functions done in libraries. Furthermore,

AI in libraries can be useful for user identification in speech or typing recognition, monitoring users as they use library resources and services, chatbots for reference services, bot assistants, monitoring drones for library security among others. Luckin and Holmes (2016) stated that there are three ways librarians can develop themselves to use AI, which are: through personal learning; engaging in intelligent support for collaborative learning; and intelligent virtual reality. This is becoming necessary because learning involves social interaction, and effective collaboration is part of the learning process.

Similarly, AI can be useful in the field of library security, with university libraries now deploying AI-based facial recognition technology to track and monitor users, particularly in areas of service (Datagen, 2022). According to a study by Ali et al. (2020), university libraries may use the following AI systems: Google Chat for chat reference, Google Drive, Drive One, RFID, 3M Gates, thumb Google Translator for translation services, among other things. Eiriemiokhale and Sulyman, (2023) stated that the librarians have the perception that AI in university libraries to have the capability of replacing human librarians in future and is a positive development for librarians.

The integration and use of AI for academic library operations offers numerous benefits which are paramount to the libraries in the digital era. But there are also several challenges in relation with the integration of AI for library operations that can not be overlooked. Subaveerapandiyan, Sunanthini and Amees (2023) stated that AI is still in its early stages of development, and many challenges need to be addressed before it can be fully integrated into libraries and information services. Huang (2022) stated

that the advent of AI has made the functions of libraries more complicated in which future librarians might need more complex, critical, innovative, and imaginative thinking, as well as emotional involvement to design and execute effective library services. The adoption of AI and robotics in libraries may be hindered by a lack of skills and the need for training prior to implementation (Tait & Pierson, 2022). AI models are heavily depend on the quality and diversity of data used for training. If the training data is biased, the AI system may exhibit biases and reinforce existing inequalities. Ensuring the quality and fairness of training data is a significant challenge.

Subaveerapandiyam, Sunanthini and Amees (2023) stated the following challenges: privacy, security and ethical considerations. Ethical considerations, such as the responsible and transparent use of AI, are crucial. Decisions made by AI systems should be understandable, explainable, and accountable. Ensuring ethical use requires careful planning and ongoing scrutiny. Kaushal and Yadav (2022) stated that despite the huge advantages of AI chatbots for improving reference services in libraries, their major drawback, a major intrusion on privacy, has to be removed by software designers during the development phase. Qomariyah et al. (2020) stated that documents about policies and procedures, technical know-how, and organizational resources, such as human and technological resources, are among challenges associated with artificial intelligence.

Asim, Arif, Rafiq and Ahmad (2023) stated that highly integrated technological infrastructure, funding/cost associated with AI, collaboration between AI experts and professionals, library users' feedback, requirement of a highly networked and integrated environment, lack of budget, high cost of AI

technologies, and lack of staff expertise as some key factors influencing artificial intelligence's adoption and application in university libraries. Also, 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.

Eiriemiokhale and Sulyman (2023) stated that poor internet connectivity, epileptic power supply, lack of expertise among librarians and low level of support from government and funding agencies as the major challenges of adopting AI in university libraries. Similarly, Sambo, Imran and Akanbi (2022) stated various obstacles of AI integration to university libraries such as power failure, lack of digital equipment, workload overwhelming, cost of digital skills training, lack of basic digital literacy skills, lack of computer literate. Contrarily, Obiano et al. (2022) stated in their study that institutional support for adoption of AI is low, but the level of ICT competence of library staff is high. It was also revealed that there is perceived usefulness of AI to the librarians and the factors militating against the adoption of AI is high, consisting of factors such as lack of needed AI tools and inadequate planning.

Cox et al. (2018) study showed that LIS professionals were concerned that AI could threaten their jobs, with the fear that most of their roles could be replaced by intelligent machines. Also, Korinek and Stiglitz (2017) emphasized that the use of AI poses a threat to the work of librarians and that caution must be taken before its widespread application in libraries. Yusuf et al. (2022) also addressed the challenges library management faces when implementing AI such as insufficient

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funding, technological hurdles, job loss, etc.

This study will delve to do justice to the following purposes of revealing the perceived awareness and usefulness of AI technologies for efficient library operations in Kwara State university libraries, as well the challenges of AI integration for efficient library operations in Kwara State university libraries.

Methods

The study adopted the descriptive survey design to gather opinions of the librarians in Nigerian university libraries on the study's research questions. The population consists of 108 librarians and paraprofessionals in all eight university libraries in Kwara State which are University of Ilorin, Kwara State university Malete, Al Hikmah University, Ojaja , University, Eyenkorin, Landmark University, Omu Aran, and Ahmad Pategi University, Patigi. A total enumeration technique was employed in order to allow all the targeted population to participate in this study. Questionnaire was employed as instrument for data collection and arranged into two major sections. Section 1 was on demographic data of the respondents, while Section 2 was fashioned towards answering the questions raised in this study. Face validity was employed. The questionnaire was given to three experts in Library and Information Science. The

questionnaire was administered to the respondents by the researchers. Data collected were analysed with frequency and percentages.

Results

The findings of this study are presented in this section.

Table 1 shows that 56(51.9%) were within the age range of 31-40 years, 25(23.1%) were 30 years and below, while 20(18.5%) were 41-50 years and 7(6.5%) were 41-50 years. Also, 70(64.8%) of the respondents were male, while their female counterpart were 38(35.2%). Furthermore, 51(47.2%) of the respondents possessed BLIS, 30(27.7%) has MLIS, while 14(12.9%) held PhD and 13(12.0%) HND in LIS. Moreover, 21(19.4%), as the majority, were Assistant Librarians, 17(15.7%) were Senior Librarians, 16(14.8%) were in status of Librarian I, 13(12.0%) were Librarian II, while 12(11.1%) were Principal Librarian and Deputy University Librarian respectively, 9(8.3%) were Higher Library Officer and 8(7.4%) were University Librarian. Lastly, 39(36.1%) had 6-10 years of work experience, 27(25.0%) had 1-5 years of work experience, 21(19.4%) 11-15 years of work experience, while 11(10.1%) had 16-20 years of work experience and 10(9.2%) 21 years and above of work experience.

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Table 1: Demographic data of the respondents $N = 108$

Demographics		Frequency	%
<i>Age</i>			
	30 years and below	25	23.1
	31 – 40 years	56	51.9
	41 – 50 years	20	18.5
	51 – 60 years	7	6.5
	61 years and above	0	0.0
<i>Gender</i>			
	Male	70	64.8
	Female	38	35.2
<i>Qualification</i>			
	HND	13	12.0
	BLIS	51	47.2
	MLIS	30	27.7
	PhD	14	12.9
<i>Staff cadre</i>			
	Higher Library Officer	9	8.3
	Assistant Librarian	21	19.4
	Librarian II	13	12.0
	Librarian I	16	14.8
	Senior Librarian	17	15.7
	Principal Librarian	12	11.1
	Deputy University Librarian	12	11.1
	University Librarian	8	7.4
<i>Work experience</i>			
	1 – 5 years	27	25.0
	6 – 10 years	39	36.1
	11 – 15 years	21	19.4
	16 – 20 years	11	10.1
	21 years and above	10	9.2
	Total	108	100.0

Table 2: Perceived awareness of AI technology for efficient library operations

Statements on awareness	Highly Aware		Aware		Rarely Aware		Not Aware	
	F	%	F	%	F	%	F	%
Aware of AI Robots	87	80.6	19	17.6	2	1.9	0	0.0
Aware of AI chatbots	65	60.2	41	38.0	1	0.9	1	0.9
Aware of Humanoids	60	55.6	46	42.6	2	1.9	0	0.0
Aware of thump recognition technology	47	43.5	60	55.6	1	0.9	0	0.0
Aware of face recognition technology	62	57.4	45	41.7	1	0.9	0	0.0
Aware of Dynamed	60	55.6	47	43.5	0	0.0	1	0.9
Aware of AI Expert Systems	59	54.6	46	42.6	2	1.9	1	0.9
Aware of Micromedex	46	42.6	60	55.6	1	0.9	1	0.9
Aware of Virtual References	61	56.4	42	38.8	3	2.7	2	1.9

Table 2 shows that majority of the respondents 87(80.6%) were highly aware of AI Robots, 65(60.2%) for AI chatbots, 62(57.4%) for face recognition

technology, 61(56.4%) for virtual references, 60(55.6%) for Humanoids and Dynamed respectively, 59(54.6%) for AI expert systems. However, 60(55.6%) of

the respondents were aware of thump recognition technology and Micromedex respectively. This implies that AI Robots, AI chatbots, face recognition technology

and virtual references are the types AI technologies that were highly aware of by the respondents.

Table 3: Perceived usefulness of AI technology for efficient library operations

Statements on perceived usefulness	Strongly Agreed		Agreed		Disagreed		Strongly Disagreed	
	F	%	F	%	F	%	F	%
AI chatbots for reference services	78	72.2	29	26.9	1	0.9	0	0.0
Humanoid robots for teaching and assistant to the librarians	59	54.6	48	44.4	1	0.9	0	0.0
Drone surveillance for library security	67	62.0	40	37.0	0	0.0	1	0.9
Robotic Book Delivery Systems	57	52.8	48	44.4	2	1.9	1	0.9
AI for automating library routines	60	55.6	46	42.6	1	0.9	1	0.9
AI Digital Alarms for notifying users' scheduled visit with a librarian	53	49.1	53	49.1	1	0.9	1	0.9
AI for cataloguing and classification	71	65.7	34	31.4	1	0.9	1	0.9
AI for circulation activities	48	44.4	45	41.6	9	8.3	6	5.5
AI expert search tools	63	58.3	42	38.8	2	1.9	1	0.9

Table 3 shows that majority of the respondents 78(72.2%) perceived that AI chatbots is useful for reference services, 71(65.7%) perceived the usefulness of AI for cataloguing and classification, 67(62.0%) perceived that AI drone surveillance can be used for library security, 63(58.3%) for AI expert search tools, 60(55.6%) perceived AI can be useful for automating library routines. Furthermore, 59(54.6%) perceived Humanoid robots can be useful for teaching and also be an assistant to the librarians, 57(52.8%) for Robotic book delivery systems, 53(49.1%) for AI digital alarms for notifying users with their scheduled visit with a librarian and 48(44.4%) perceived AI can used for circulation activities. This implies that AI chatbots for reference services, AI for cataloguing and classification, Drone surveillance for library security, AI expert search tools and AI for automating library

routines were the perceived usefulness of AI technologies by the librarians.

Table 4 shows that potential loss of job 78(72.2%), high risk of maintenance 71(65.7%), inadequate internet service provision 65(65.2%), technical problems 61(56.4%), epileptic electricity or power supply 56(51.9%), and Inadequate ICT facilities for AI technologies 48(44.4%) are the challenges of AI technologies for efficient library operations the respondents were strongly agreed. Furthermore, Insufficient artificial intelligence equipments and Insufficient funding from the parent institution with 60(55.6%) are also parts of the challenges of AI technologies for efficient library operations as were agreed to by the respondents. However, the respondents disagreed with lack of technical skills to operate AI technologies 4(3.7%) as a challenge of AI technologies for efficient library operations.

Table 4: challenges of AI technology integration for efficient library operations

Statements on challenges	Strongly Agreed		Agreed		Disagreed		Strongly Disagreed	
	F	%	F	%	F	%	F	%
Inadequate ICT facilities for AI technologies	48	44.4	45	41.6	6	5.5	9	8.3
Insufficient Artificial Intelligence equipments	47	43.5	60	55.6	1	0.9	0	0.0
Insufficient funding from the parent institution	43	39.8	60	55.6	3	2.8	2	1.9
Technical problems	61	56.4	42	38.8	3	2.7	2	1.9
Inadequate internet service provision	65	60.2	40	37.0	2	1.9	1	0.9
Potential loss of job	78	72.2	29	26.9	1	0.9	0	0.0
Lack of technical skills to operate AI technologies	4	3.7	9	8.3	53	49.1	34	31.4
Epileptic electricity or power supply	56	51.9	49	45.4	1	0.9	2	1.9
High risk of maintenance	71	65.7	34	31.4	1	0.9	1	0.9

Discussion

Results revealed that AI Robots, AI chatbots, face recognition technology, virtual references, Humanoids, Dynamed and AI expert systems are the AI technologies the respondents were highly aware of. This support the opinion that robots and chatbots are becoming invaluable in LIS profession. Oladokun et al. (2023) stated that robots can enhance library services and give users the reliable information that can foster growth and development in the information age. Chatbots has become a veritable AI tool that enhances the provision of more efficient services to library users, it also provides round-the-clock support, answer users' query, and significantly enhance customer service in libraries (Jones, 2019). It is no longer news that humanoid robots are now available in libraries in both rich and developing nations (Tella, 2020). Dynamed is a not too common AI technology in Nigeria as stated by Eiriemiokhale and Sulyman (2023).

Furthermore, this study revealed that the respondents perceived the usefulness of AI technologies for efficient library operations such as AI chatbots can

be useful for reference services, AI can be used for cataloguing and classification of library materials, AI drone surveillance can be used for library security, AI expert search tools for information search, AI can be useful for automating library routines. This corroborate the findings of Asefeh and Asemi (2018) they stated that AI technologies can be used to improve library services such as cataloguing of library materials, circulation services, among others. Mughali (2019) stated that AI can be used for expert systems in libraries, such as Refsearch, indexes, online reference help, and Plexus Expert. Also, Saldin (2020) stated that AI can be used for user identification in speech or typing recognition, monitoring users as they use library resources and services, chatbots for reference services, bot assistants, monitoring drones for library security.

It has been affirmed in many studies that AI technologies has not been integrated in many university libraries in various parts of the world. This is due to some series of challenges. This study revealed that potential loss of job, high risk of maintenance, inadequate internet

service provision, technical problems, epileptic electricity or power supply, and Inadequate ICT facilities for AI technologies as the significance challenges of AI technologies for efficient library operations by the respondents. This attest to the submission of Yusuf et al. (2022) that insufficient funding, technological hurdles, job loss, among others are the reason for poor utilization of AI technology in university libraries in developing nations. University libraries, particular in Nigeria, continues to struggle with automation and digital information resource conventions, to say nothing of artificial intelligence (Oniovoghai et al. (2023).

Conclusion

Artificial intelligence is prominent technology that not only the information institutions trying to embrace, but for many other large institutions and organizations because it is one of the most promising technologies in digital era and transforming the overall information landscape of libraries and other sector around the world. This study concluded that AI Robots, AI chatbots, face recognition technology, virtual references, Humanoids, Dynamed and AI expert systems are the major AI technologies the librarians were highly aware of in Kwara State. It further concluded that librarians positively perceived the usefulness of AI technologies for library operations in Kwara State to includes AI chatbots can be useful for reference services, AI can used for cataloguing and classification of library materials, AI drone surveillance can be used for library security, AI expert search tools for information search, AI can be useful for automating library routines. However, the integration of AI technologies for library operations also galloped into some challenges such as potential loss of job, high risk of

maintenance, inadequate internet service provision, technical problems, epileptic electricity or power supply, and Inadequate ICT facilities for AI technologies.

The integration of AI technology for library operations will no doubt significantly elevate libraries and librarians to meet the needs of users in this digital era because the invaluable presence of it can no longer be ignored and it trends is changing user demands and information needs. Due to this, the following recommendations are made:

1. Management of university libraries in Kwara State should integrate AI technology including robots, chatbots, and expert systems in other to provide top-notch services to their users.
2. The library management should seek financial support from the government and agencies to invest in the necessary facility for the successful integration of AI technology for library operations.
3. Management of the university libraries should establish a reliable and reach internet connectivity infrastructure with fast broadband network by reaching mutual agreement with the internet service provider in other to facilitate the seamless integration of AI technology for library operations.
4. The management of university libraries in Kwara State should provide an uninterruptible power supply and alternative power source in other to warrant the coherent the availability of power needed to brace the AI technology integration for library operations.
5. The university libraries should endeavour to educate their librarians in the area of AI technology in other to enhance their expertise in AI and enabling them to efficiently integrate

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