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Artificial Intelligence Versus Library Practice in the New Normal: A Practical Exploration of Opportunities and Challenges with Reference to Developing Countries

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BSTRACT
The paper is focused on artificial intelligence versus library practice in the new normal: a practical exploration of opportunities and challenges. The paper examined the experiences as it is in developing countries, especially in libraries within the African continent. Content analysis was used in generating data for the paper. Highlights of the paper include – the attributes of the new normal environment, the now and future of artificial intelligence (AI) in librarianship; justification for integrating artificial intelligence (A)I to library service delivery; implications of artificial intelligence (AI) to librarianship; opportunities opened by artificial intelligence (AI) to library and information science practitioners; potential factors limiting effective application of artificial intelligence (AI) to library service delivery in developing countries.

Keywords: Artificial intelligence, developing countries, library practice, new normal

1. INTRODUCTION

Librarians are in a world filled with changes driven by technological development. However, by reason of these changes, librarians are expected to adopt different approaches towards information service delivery as opposed to what is obtainable in conventional libraries. This no doubt assists them to harness the potentials inherent in new technological tools. Librarians should be positioned to rise to the challenge that artificial intelligence presents to their field. Libraries and allied institutions have existed for millennia; they progress with the society, altering and adapting their services to meet the information needs of their communities (Hervieux & Wheatley, 2022). Undoubtedly, the demand for efficient information service delivery system has always been in place since the evolution of documented knowledge. However, one begins to wonder, the fate of library and information professionals in the face of the new order, otherwise tag as "Artificial Intelligence Era". The information age makes it easier to store huge amounts of data and increase the number of documents on the internet, in institutions, intranets, in newswires and blogs is overwhelming (Azeroual *et al*, 2018).

Librarians are required to recognize and understand the technological opportunities to the contemporary and potential user communities (Nawaz & Saldeen, 2020). Generally, AI-powered content management is already a game-changer, scalable, extremely fast, and benefits individuals via teams and departments, and the organization as a whole (Bernhardt, 2023). AI is a technology that is taking over intellectual capacities previously associated solely with humans (Gasparini & Kautonen, 2022). Obviously, AI technologies have now become a central concern of academic and public discourse as they continue to disrupt industries and several aspects of our societies and daily life (Arakpogun *et al*, 2021). Like in many other disciplines, AI can help libraries update and expand their services and also promote their relevance in the present day digital world (Olayode, 2022).

The 21st century has seen exponential growth in the sophistication of artificial intelligence, especially since the rise of Big Data in the 2010s (Council of European Union, 2023). In the context of practical implications in library and information services, it would be relevant to note that though open source AI-based conversational software requires more in-depth research in order to perfectly learn and emulate human conversations, it nonetheless has boundless powers to induce a tectonic shift in the way libraries function and interact with their patrons (Bagchi, 2020). In other words, the emergence of technologies have revolutionized the world and changed the way people do things (Njuku, 2022).

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Technology is changing virtually every facet of human endeavors. Embracing technology in any sector comes with opportunities and new challenges, librarianship is not any exemption. AI-based technologies are increasingly entering academic library life (Bowker *et al*, 2022). AI is an important emerging trend in information technology, which is gradually being integrated into digital tools used within libraries (Ali *et al*, 2021?). Artificial intelligence (AI) has developed rapidly in recent years, and significant social and economic impacts are already being felt (Lemelin- Bellerose, 2019).

Libraries in the 21st century are realizing the need to shift their services from traditional practices to technologically driven platform (Umeozor & Emaesealu, 2022). The libraries of twenty-first century are shifting their paradigms from traditional set-up to modern information networking (Wood, n. d.). In today's fast changing world, organizations are looking for ways to maintain and grow their competitive advantage.

AI is already reshaping the higher education landscape and librarianship is not exempted. The emergence of AI also creates an imperative for universities to empower students with goal setting and moral reasoning capabilities to make decisions that cannot be left to AI systems alone (Minerva Project, 2023). Evidence has shown that the library profession has evolved and is constantly transforming to meet the trends in today world (Umeozor & Emasealu, 2022). Library services can be done in more effective and efficient ways for improved user satisfaction. This will enable library users to access timely and accurate information quickly and promptly (Yusuf *et al*, 2022). The libraries of this dispensation no doubt are migrating from conventional librarianship to new dimension of information. Within the library parlance, there are many opportunities for library and information science professionals to explore and harness in order to keep their users in tune with library services delivery (Benson, Igbokwe & Onyam, 2020)

Problem statement and purpose of the study

It has been observed from literature that sound knowledge of artificial intelligence can be leveraged on to enhance library services delivery in both developed and developing countries. AI is changing the narratives and how people go about their day to day activities in every sector of human endeavor, however, thus is not the case with librarian services delivery in developing countries, evidence abounds that AI application in librarianship in developing countries have not received the needed attention. It is on this note that the researchers decide to explore the opportunities and challenges incorporating it to library services delivery

This paper is centred on "artificial intelligence versus library practice in the new normal: a practical exploration of opportunities and challenges with reference to developing countries. Specifically, the paper seeks to:

1. provide an overview and conceptual analysis of the term "artificial intelligence";
2. assess the now and future of artificial intelligence in librarianship;
3. discuss the justification for incorporating artificial intelligence to library services delivery;
4. describe the implications of artificial intelligence application in library and information centres;
5. highlight on the areas of artificial intelligence applicability in library and information science;
6. identify the challenges to artificial intelligence application in library service delivery; and
7. make recommendation in line with the challenges identified

2. ARTIFICIAL INTELLIGENCE: AN OVERVIEW

Artificial intelligence (AI) is the ability of a digital computer-controlled machine or robot to perform tasks commonly associated with intelligent being like humans. AI refers to a family of technologies that allows computers and other machines (e.g. robots) to perform tasks previously thought to rely on human experience, creativity and ingenuity. It involves the ability of machine to function autonomously, and "learn" from large volumes of input data, without being explicitly programmed for the required task (Elbehri & Chestnov, 2021). AI is the study of how to build computer systems that exhibit intelligence in some manner. AI has resulted in many breakthroughs in computer science (Teacham, 2010). Artificial intelligence (AI) is an area of computer science that focuses on creating mostly software solutions that are capable of performing pseudo-human intellectual tasks (Hoghai, 2020).

The term artificial intelligent was coined in 1955 by John McCarthy; It is used to denote any sort of intelligence that does not arise through natural processes, or where intelligence can be understood to be created (Griffey, 2019). Holmes et al (2022) defined AI as "a set of sciences, theories and techniques whose purpose is to reproduce by a machine, the cognitive abilities of a human being. AI refers to an extremely diverse array of technologies, from the spell check feature in a 1990s word processing program to the self-driving cars we may be riding in one day. Current development aim, for instance, to be able to entrust a machine with complex tasks previously delegated to a humid (Council of Europe, 2011). According to Singh, Rai, and Singh (2019), artificial intelligence technology is now becoming relevant in various fields.

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3.0 THE NOW AND FUTURE OF ARTIFICIAL INTELLIGENCE IN LIBRARIANSHIP

It is important to have a clear understanding of where librarianship as a profession is now in developing countries. For instance, despite the bunch of benefits that AI offers to users, especially academic librarians, its usage in the libraries has become matter of serious concern due to its non-utilization by librarians (Yakubu, Yagana and Umar, 2023). The modernization of libraries and information centers from analog to digital information hub has enabled ease of information transfer and access, thereby creates a network of libraries (Olayode, 2022). However, since long before the invention of the digital computer, humans have dreamed of non-human creatures and things that could reason and solve problems.

A qualitatively new technological stage has begun under the label of artificial intelligence" (AI) as part of the implementation of certain digital technologies used within the labor context in society (Albreaht & Kellermann, 2020). With the exponential generation of information, utilization of artificial intelligence tools is inevitable in the processing, storage, and dissemination of these valuable information resources (Obiano et al, 2022). AI is used in everything from giving driving directions to identifying objects and scenery in photograph, not to mention the systems behind each company's artificial agent systems. AI applies to different sector in the modern world. Its apps have transformed most areas resulting in quality work and faster means of business operations. The subject of artificial intelligence (AI) is being discussed everywhere in the media (Wood & Evans, 2018).

In the modern world, AI is everywhere. It is used in modern video games to control the action of non-player characters, in analyzing texts to provide summaries for readers, and in determining whether or not a photo has a cat in it (Griffey, 2019). Lemelin-Bellerose (2019) citing several experts, affirmed that AI has the potential to change significantly over the next few decades. The development of AI is now at a stage called "Artificial Narrow Intelligence (ANI) since it is currently at a level lower than that of human intelligence: it can solve one problem at a time. Onaolapo and Onifade (2020), citing Popenici et al (2017) averred that AI is currently progressing at an acceleration pace, and this already impact on the profound nature of services within higher education in developed regions.

According to Xiao (2017) in Ali et al (2021?), future library research support will depend upon AI technologies to deliver services to researchers. The time has come up where the smart machines are ready to take over intelligent work of humans for better and efficient results (Singh, Rai & Singh, 2019). The AI applications in the libraries are at nascent stage. Undeniably, AI has vast applications which will help the users in their information needs (Arora et al, 2020). Libraries increasingly expect discovery services to provide access to broad representation of their collections (Breeding, 2013). Njuku (2022) citing Omehia (2019) affirmed that in this current trend, the library as part of the society is not left behind, as there have been significant changes from traditional repository, manual service delivery to a more dynamic technology driven environment where information is transmitted instantaneously.

AI unarguably holds the potential to revolutionize teaching and learning in Africa by eradicating challenges associated with conventional educational methods. Moreover, in this wireless and interconnected era, the most practical way to accomplish new aims and targets is by adopting advanced innovative technologies within the day-to-day library operations (Onaolapo and Onifade (n.d.); Olayode, 2022). Arlitsch and Newell (2012) as cited in Yakubu, Yagana and Umar (2023) posit that AI is one of the most recent digital transformations that academic libraries can unlock its potential to provide patrons with varying library service alternatives more conveniently. Artificial intelligence is not only changing the general information landscape of libraries around the world, but also affecting the traditional job role of library and information professionals (Olayode, 2022). While AI and, machine learning systems will provide untold benefits to libraries, the risks and concerns that have arisen over the last several years in regard to AI systems should give us a significant pause (Griffey, 2019).

Libraries have been receiving various types of impacts due to applications of artificial intelligence in its regular and special working environment. Artificial intelligence is going to grab functions of libraries via collection development maintenance of collection, library service and reference mechanism (Sing, Rai & Singh, 2019). The future of AI in librarianship is bright as it will in no small measure revolutionized the landscape of information service delivery in developing countries.

Libraries can adopt conversational AI platforms to boost their existing relationship with their patrons in the new normal era (Pandas & Chakravarty, 2019). Library and information science professionals have been providing various information services to people worldwide for many years, which no technology has replaced (Kirtania, 2023). While the full extent of how AI tools will transform higher education is impossible to predict, institutions that evolve by integrating AI into teaching and learning will minimize disruption while better serving their students (Minerva Project, 2023).

In the current digital transformation technologies and tools used for work are rapidly changing (Tuomi, 2020). Academic libraries in Nigeria have not yet adopted and applied AI, despite the potential that it holds for libraries (Oladokun et al, 2023). Despite all AI potentials in libraries, academic libraries in Nigeria according to Yusuf et al (2022) are yet to adopt and implement AI. This to them might be due to low level of awareness and adoption of AI's relevance in libraries, even as research connecting AI to librarianship remains relatively low. Libraries

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can use AI tools to provide not just information but deep intelligence offering insight (Khazoce & Sarode, 2020). The application of AI and machine learning in libraries is an emerging trend that has captured the attention of relevant practitioners and academics (Das & Islam, 2020).

4 JUSTIFICATION FOR INCORPORATING ARTIFICIAL INTELLIGENCE TO LIBRARY SERVICE DELIVERY

Several reasons accounts for why artificial intelligence tools should be integrated to library services delivery. Libraries provide the gateway to information access and use, thus, in every academic institution and other social organizations, libraries are required to keep abreast with changes in the society especially, as it concerns individuals, who are the major patron of services rendered in libraries (Umeozor & Emaeselau, 2022). Mess (1991) posits that as new technologies make possible the packaging of knowledge, putting expertise or guidance at one's fingertips. Moreover, of libraries remain relevant to explore information management; they face competition with computer information centers which are beginning to see online data sources as their domain. According to Arora et al (2020), libraries are creating new operating models and it is important for any library to adapt new tools and techniques to serve their users better for their sustainability. As many libraries continue to see reductions in funding, technology is increasingly seen as a way to make up for budget shortfalls (McNeal & Newyear, 2013). In line with this, Griffery (2009) averred that like all emerging technologies, if we don't understand it, don't experiment with it, and don't build some of our own tools, we will be beholden to the commercial entities that trade our failures for our money. Although, libraries are not foreign to technological changes, as there are many tools to be implemented in the service of patrons, research, and education (Izquierdo, 2022). Likewise, AI tools are not entirely new within the domain of information service delivery.

Artificial intelligence (AI) has the potential to transform the roles and function of libraries in order to serve the new generation of library users (Nawaz & Saldeen, 2020). Bowker et al (2022) citing Arlitsch and Newell (2017) affirmed that "AI will transform library services, forever altering the mix of skills and tools needed to serve our users. At the same time, AI will change the lives of our users, and the dynamics of our communities. It is difficult to forecast exactly what, or how pervasive, these changes will be, but change is certain". As noted by Obiano et al (2022), the advent of AI is so robust that it has changed many narratives on how tasks are executed by humans lately. AI has evolved and gone beyond the initial trend, a trend that is gradually becoming necessary for libraries in Nigeria to adopt. According to Ajakaye (2022), librarianship as a profession is known for incorporating cutting-edge technologies not just for information dissemination. Hence, artificial intelligence has become the new emerging trend for libraries.

According to Umeozor and Ibeagwam (2022), the evolving roles of librarians, engendered by ICT revolution, have posed several challenges for the profession. The modern information environment is mostly driven by ICT. There is great reliance on new technology advancement in order to supply creative and cutting-edge information service that fulfill the consumers, shifting needs. Libraries must adopt and incorporate cutting-edge technologies, such as artificial intelligence, in order to effectively provide information services that meet the demands of the modern world (Oyetola et al, n.d.).

The emergence of information and communication technology has influenced the library as an institution with rapid changes from print to virtual or digitized documents that can be accessed from anywhere; and through the emerging technologies, the application of expert systems as an aspect of artificial intelligence to library service delivery will be awesome. In order to avoid a repeat of the missed opportunities from previous industrial revolutions that have left a negative legacy for Africa countries, governments must create an enabling environment for these AI startups to flourish and accelerate the socio-economic development of Africa (Arakpogun et al, n.d). AI may assist libraries in updating and expanding their service and in promoting their relevance in the contemporary digital environment (Oyetola et al, n.d.).

According to Yeboah (2020), AI also has the power to transform the way government deliver public services, as this could significantly improve citizens; experiences of government while reducing cost for people accessing theses services from rural and peri-urban communities. Artificial intelligence has proven to be a breakthrough for information driven sector such as law, health, commerce, and the auto industry. AI is not an existential threat to librarianship; it must be viewed as an opportunity (Woods & Evans, 2018). Artificial intelligence has massively transformed the human population in terms of technology, leading to the rise of new devices and tools that are hugely important in doing business, education, and communication (Mohammad, 2020). Libraries need to immerse their services in the academic life of patrons, physically and virtually and like previous technologies, AI will not be a threat, it will be a tool for libraries to remain vital and responsive (Emezie & Nwaohiri, 2022).

The real power of conversational AI lies in its ability to simultaneously carry out highly personalized interacting with large numbers of individual library users (Panda & Chakravarty, 2021). Conversational AI enables libraries to hold seamless, synchronous conversations with consumers across whatever channel they happen to be rising at the time, no matter where they are (Panda & Chakravarty, 2021).

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Generative AI has already begun to impact knowledge work, as professionals adopt new tools to accomplish labor-intensive tasks more efficiently and even produce work they couldn't have previously due to a lack of technical expertise in areas like coding and design (Minerva Project, 2023). Not only is artificial intelligence a rapidly advancing technology, but the capabilities of AI which allow it to learn from experience and to perform autonomously from humans, make artificial intelligence the most disruptive and transformative technology of the early twenty first century (Barfield, 2018).

The 21st century has been regarded as knowledge economy/information era. This has made the job of librarians tedious as they strive to ensure access to accurate, relevant and timely information, while grappling with professional transformation (Umeozor & Emasealu, 2022). AI technologies are now being used in libraries to achieve the organic integration of readers and libraries. When this is done, readers interact on the same platform, track and acquire the personalized needs and information of users so that users can access information accurately and humanized services, at a reduced cost to rationally utilize library resources (Yusuf et al, 2022).

AI adoption and use in library will allow for better information processing and at the same time, better information search that will excite both library personal and users since these will be easier and faster access to information (Yusuf et al, 2022). As espoused by Gujral, Shivarama & Choukimath, (2019), but with the eventual acceptance and incorporation of AI into its services, it is certainly possible to speculate that this latest technology "intrusion" could offer many potential positive enhancements into a multitude of library services. As pointed by Arakpogun et al (2021?), in order to avoid a repeat of the missed opportunities from, the previous industrial revolutions that have left a negative legacy for African countries, government must create an enabling environment for these AI start up to flourish and accelerate the socio-economic development of Africa.

Library and information centers will get benefits by the development of the efficient expect system for technical services as well as information processing and management (Khanzode & Sarode, 2020). AI offers a powerful set of tools, especially when they are combined with conventional and other innovative computing tools (Bailey, 1991). Artificial intelligence enables libraries to provide valuable experiences to their users. AI plays a vital role in updating and expanding the value proposition of the library system (Gundakanal & Kaddipuyar, 2019).

5 IMPLICATIONS OF ARTIFICIAL INTELLIGENCE IN LIBRARY AND INFORMATION CENTRES

Incorporating artificial intelligence to library services delivery is not without implications for both librarians and the profession in general. Some of these implications include but not limited to the following:Adopting a collaborative approach: Since there are a lot of technicalities associated with adoption and use of AI tools in providing library services, librarians are expected to collaborate with software developers and experts in technologies in ensuring that AI is fully incorporated into library service delivery. Adopting a collaborative approach will engenders seamless integration of artificial intelligence to library service delivery.

Training of library and information professionals: Librarians cannot effectively operate using AI tools without training and re-training of its personnel. No wonder, Emezaiwakpor, Idiodi and Urhiewhu (2023) posit that libraries will need to prepare their own personnel and become centers of ongoing education for their communities as machines begin to take over an increasing share of human "thinking" job. Retraining: as espoused by Singh, Rai and Singh (2019), libraries would require library professional trained with artificial intelligence technology. In this context, library professionals trained with technology would perform efficient work with saving of time.

Formulating AI Application Policy to guide incorporation to library service delivery: There is need for a well-defined AI policy application to library service whereby the nature of services that will be provided, the extent of use the ethical considerations surrounding such services to be provided with AI will be explained. As AI is gaining popularity with new inventions coming up annually, it is imperative that policymakers should consider using AI-powered technologies in their organizations to help in most company operations that are important (Mohammad, 2020). This also should be applicable to library and information services.

Revisiting the curriculum used in library schools: There is an urgent need to revisit and restructure the curriculum used in training prospective librarians, especially in library schools domiciled in developing countries. Woods and Evans (2018) proposed that deans of library schools should begin the discussion by addressing curriculum adjustment as well as factoring in the sustainability of current levels of enrollment in library schools. The exigency and urgency of this call should not be neglected. This is because the future of prospective librarians in library school is hinged on the nature of curriculum used in training, hence the need to redesign the curriculum to meet the demands of prevailing condition in the workplace and larger society.

Creation of awareness through strategic "Artificial Intelligence Awareness Campaign": It is imperative that library and information professionals strategize by sensitizing librarians and stakeholders on the need to reposition and embrace AI tools as part of its routines in day to day operations in library and information centres. Library and information system now are integrating machine learning and voice assisting technologies for better information

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assistance services. One of the key roles that information professionals can play in the evaluation of AI tools is the awareness of potential and actual bias (Upshall, 2022).

6. AREAS OF APPLICABILITY OF ARTIFICIAL INTELLIGENCE IN LIBRARY AND INFORMATION SCIENCE

There are many ways in which libraries are getting involved with AI tools (Izquierdo, 2022). AI technology could automate some of the traditionally performed routine task such as cataloguing and information retrieval. However, Emezaiwakpor, Idiodi and Urhiewhu (2023) averred that the incorporation of AI into academic institutions for the delivery of services has opened doors for serious concerns affecting traditional library routine services to be addressed in a timely manner. They further affirmed that shelf space for book and other information materials, cataloguing and categorization, serials functions, collection development, and procurement of resource materials, among other things, shall be addressed urgently and properly. According to Njuku (2022), the application of expert systems is useful in the library as it makes existing expertise more readily available particularly in multiple locations.

Nevertheless, while AI tools have the potential to improve our lives and the lives of those we serve, they are unable to replace the human interactions that set us apart from any technology. In which case, libraries can embrace the AI revolution by evaluating these new tools and developing services to support their use (Cox & Tzoc, 2023). Ali, Naeem and Bhatti (2020) as cited in Tsimara, Oikononou and Katsirikou (2023) averred that Robotics, chatsbots, natural language processing, Big data, and text data mining are all examples of how artificial intelligence is making its ways into the library environment as a result of the growth of the internet and the abundance of information. Izquierdo (2022) citing Wheatley and Hervieux (2019), Cervone (2011), Pinfield, Cox and Rutler (2017) affirmed that chatbots, document classification, personalized services, TDM, intelligent education, and user discovery are just some of the AI development in libraries. Emiri (2023) citing Yu et al (2019) investigation of smart libraries' usage of AI averred that AI applications that can be applied in library service delivery such as face recognition, chatbots and self-service AIs. According to Honghai (2020), today's information technology provides numerous solutions for real-time and selective dissemination of information and these solutions are most recently, delivered as AI powered systems which leverage machine learning and Big data at its core.

AI tools are described as automating some laborious or error-prone library operations, enabling faster processes in larger volumes and assisting with librarians' tasks (Gasparini & Kautonen, 2022). Also, Emiri (2023) posit that AI can be employed for user identification in speech recognition or typing, monitoring of users as they use library resources and services, chatbots for reference services, robot assistants, drone surveillance for library security. Applicability of AI in library can be experienced with extracting of the most relevant information from huge information reposting and providing it to the users in the simplest possible way (Arora et al, 2020). According to Gujral, Shivarama & Choukimath (2019), librarians can adopt artificial intelligence for several purposes such as reference services, teaching information literacy skills, monitoring and evaluation, information search and retrieval processes (Gujral, Shivarama & Choukimath, 2019). According Yusuf et al (2023), AI has made it possible to provide solutions to pressing challenges facing libraries, such as shelving materials, cataloguing and acquisition of library materials.

7. POTENTIAL FACTORS LIMITING EFFECTIVE APPLICATION OF AI TO LIBRARY SERVICES IN DEVELOPING COUNTRIES

1. It has been widely acknowledged that incorporating AI into library services delivery come with lots of benefits. However, despite these benefits, there are still factors limiting the extent to which librarians integrate AI to library service provision in developing countries. Some of these factors are:
2. Absence of sufficient technological infrastructures: Critical examinations of libraries in developing countries reveal the absence of relevant digital infrastructure without which the incorporation of AI remains a mirage. As noted by Onaolapo and Onifade (n.d.), the optimization of AI for education requires an environment with adequate infrastructure, state-of-the art data facilitates and requisite AI expertise, which are largely inadequate in Africa.
3. Inadequate fund: Most libraries in developing countries are grossly underfunded and this to a large extent affects full integration of AI application tools to library service delivery. Olayode (2022) citing Yusuf et al (2022) identified the challenges librarians encounter when utilizing AI for library practices as inadequate funds among others. Finance is required to purchase digital infrastructure recruit experts.
4. Technological barrier: The level of technological development in developing countries is not same with that of developed nations. This apparently will adversely affect the integration of AI to library practice. A challenge to the development of locally created AI applications for use in academic libraries is likely to be a shortfall in large, representative amounts to the local community and the purpose (Nayyer & Rodriquez, n.d.).

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5. Unreliable power supply: according to Adamu (2018), every digital environment depends on electricity and internet. The state of unsteady power supply in most countries is worrisome. Most digital infrastructure are power-driven, so the absence of steady power supply is a threat to full integration of AI into librarianship.
6. Low level of digital literacy: the actualization of full operation in libraries with AI is not feasible with the level of digital literacy in developing countries. Both librarians and library patrons must be digitally conscious and literate to harness its potential and benefits. Digital information literacy is the set of digital abilities requiring individual to recognize when digital information is needed and have the ability to locate, evaluate, organize and effectively use the needed digital information in an ethical and legal way.
7. Lack of expertise: Adamu (2018) referring to university libraries in Nigeria averred that they are confronted with lots of interesting technologies but limited in resources and expertise needed to put these technologies into proper use. In other words, it is not enough to desire to incorporate AI to library services without factoring in the place of skilled expertise that will manipulate these tools for optimal delivery.
8. Low level of inter-disciplinary cooperation: the low level of inter-disciplinary cooperation among librarians, libraries and other disciplines is an impending factor to full incorporation of AI to library operations and services. This fact was also buttressed by Ekere, Benson, Eke and Emuchay (2022) that librarians and library administrators hardly explore the window of opportunities associated with partnering with other disciplines.

6. CONCLUSIONS AND RECOMMENDATIONS

The increase in the use of technological tools in providing library and information services is calling for a shift from just ICT tools to artificial intelligence applications to library services. There is need to ensure smooth transition from analogue service provision to digital service provision using AI tools. Therefore, library and information professional can no longer afford to be passive on the subject matter of AI and librarianship. It is imperative that focus should be redirected from just ICT tools to AI application tools. Above all, there is need for strong synergy between stakeholders as this will enhance the reliability of customized AI tools for library practice. On the basis of the study, the following recommendation were made to enhance the opportunities and overcome the challenges

1. Provision and improvement of digital infrastructure in developing countries: It is pertinent that librarians should ensure that digital infrastructures necessary for full scale application of artificial intelligence are provided. This will provide the platform for embracing AI tools into the mainstream of library services delivery.
2. Engaging in sustainable collaboration with stakeholders: to ensure seamless transition towards full application of ICT tools in library services delivery, there is need for sustainable collaboration with stakeholders and allied discipline to achieve the set goals.
3. High level sensitization and awareness: there is need for high level sensitization and awareness as most heads of libraries are already unsettled with the feelings that AI tools have come to displaced them from their jobs.
4. Provision of steady power supply: it is pertinent that heads of libraries in developing countries should take proactive measures towards providing alternative means of generating electricity due to its insufficiency and instability of power supply as witnessed in developing countries.
5. Absence of digital/technical infrastructure: Adamu (2018) contends that libraries and information centres must have in place technological infrastructure (readiness factor) that will provide an enabling platform for skilled human resources to operate smoothly and productively.

Practical implications

The findings and outcome of this paper will be of help to library administrators and stakeholders in library sector. It will also inform decision making so as to enhance the diffusion of artificial intelligences and improve library services delivery. This study will inform library and information professionals in developing countries on the need to embrace artificial intelligence tools and incorporate it fully to library service delivery.

REFERENCES

1. Abbas, K. D. (2017). Role of information and communication technology in facilitating legislative functions for effective local government administration in Kano State, Nigeria. Ebonyi Journal of Library and Information Science, 4 (2), 343 - 352
2. Abioye, A. (2013). Education and training in preservation and conservation of cultural heritage
3. Ajakaye J. E. (2022). Applications of artificial intelligence (AI) in libraries. Doi:10.4018/978-01-7998-9094-2.ch006.
4. Alabi, A. O. (2018). Information and communication technologies (ICTs) application to cataloguing and classification in Nigeria libraries. Nigerian Libraries, 51 (2), 83 - 92

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5. Albrecht, T. & Kellermann, C. (2020). Artificial intelligence and the future of the digital work-oriented society: An outline for a holistic technology impact assessment. https://library.fes.de/pdf-files/bueros/bratislava/16955.pdf
6. Ali, M. Y., Naeem, S. B., Bhatti, R. & Richardson, J. (2021?). Artificial intelligence application in university libraries of Pakistan: SWOJ analysis and implications.
7. Arakpogun, E. O., Elsahm, Z., Olan, F. & Elsalm, F. (2021?). Artificial intelligence in Africa: challenges and opportunities.
8. Arakpogun, E. O., Elsalm, Z., Olan, F. & Elsalm, F. (2021). Artificial intelligence in Africa: challenges and opportunities. Available online at: https://researchportal.northumbria.ac.uk/ws/portalfiles/portal/31309999/AI_in_Africa_Opportunities_and_Challenges_Paper_68_Manuscript.pdf
9. Arora, D., Bansal, A., Kumar, Suri, A. (2020). Invigorating libraries with application of artificial intelligence. Library Philosophy and Practice. https://digitalcommons.unl.edu/libphilprac/3630/
10. Azeroual, O., Saake, G., Abuosba, M. & Schoptel, J. (2018). Text data mining and data quality management for research information systems in the context of open data and open science. Available online at: https://dspacecris.eurocris.org/bitstream/11366/715/1/Final_Manuscript_ICOA%2718_Azeroual.pdf
11. Bagchi, M. (2020). Conceptualizing a library chatbot using open source conversational artificial intelligence. DESIDOC Journal of Library & Information Technology, 40 (6), 329 - 333; DOI:10.14429/djlit.40.6.15611.
12. Bailey, C. W. (1991). Intelligent library system: artificial intelligence technology and library automation system.
13. Benson, O. V., Amaechi, N. M. & Onuoha, C. O. (2017). Exploring available opportunities for self-development for enhanced productivity and efficiency of library and information services. Lagos Journal of Library & Information Science, 6 (1&2), 96 -104.
14. Benson, O. V., Igbokwe, J. C. & Onyam, I. D. (2020). Towards repositioning libraries and information centers for the fourth industrial revolution era. Compendium of Papers Presented during Nigerian Library Association, Anambra State Chapter 2020 Conference and Annual General Meeting.
15. Bernhardt, M. (2023). AI's increasingly important role in L&D. New York: The learning Guild.
16. Bowker, L., Kalsatos, M., Ruskan, A. & Ciro, J. B. (2022). Artificial intelligence, machine translation, and academic libraries: improving machine translation literacy on campus. In: Hervieux, S. & Wheatley, A. (ed.) (2020). The rise of AI: implications and application of artificial intelligence in academic libraries. Chicago, Illinois: Association of College and Research Libraries, pp.35-46.
17. Breeding, M. (2013). Beyond the ILS: a new generation of library service platforms. DOI:10.4018/978-1-4666-3938-6.ch002.
18. Council of the European Union (2023). Chat GPT in the public sector-overhyped or overlooked. https://www.consilium.europa.eu/media/63818/art-paper-chatgpt-in-the-public-sector-overhyped-or-overlooked-24-april-2023_ext.pdf
19. Cox, C. & Tzoc, E. (2023). Chat GPT: implications for academic libraries. C&RL News, March, 99 - 102.
20. Das , R. K. & Islam, M. S (2020). Application of artificial intelligence and machine learning in libraries a systematic review.
21. Elbehri, A. & Chestnov, R. (ed.) (2021). Digital agriculture in action artificial intelligence for agriculture. Bangkok: Food and Agriculture Organization of the United-Nations.
22. Emezaiwakpor, M. O., Idiodi, E. O. & Urhiewhu, L. O. (2023). Artificial intelligence (AI) in service delivery to academic library by librarians in Nigeria. International Journal of Library and Information Science Studies, 9 (2), 41-53.
23. Emiri, O. T. (2023). Adoption and utilization of artificial intelligent by librarians in university libraries in southern Nigeria. Library Philosophy and Practice (e-journal). 7570. https://digitalcommons.unl.edu/libphilprac/7570.
24. Gasparini, A. & Kautonen, H. (2022). Understanding artificial intelligence in research libraries: an extensive literature review. Liber Quarterly, 32, 1-36.
25. Griffey, J. (Ed.) (2019). Artificial intelligence and machine learning in libraries. Library Technology Reports, pp. 5 - 9.
26. Gundakanal, S. S. & Kaddipyar, M. (2019). Intelligent libraries: new horizon with artificial intelligence. Journal of Information Management and Education Technology, 3 (2&3), 08 - 17
27. Gwagwa, A., Kraemer-Mbula, E., Rizk, N., Rutenberg, I., & Beer, J. (2020). Artificial intelligence (AI) deployments in Africa: benefits, challenges and policy dimensions. AJIC Issue, 26, 1-28. The African Journal of Information and Communication (AJIC), 26 - 28.
28. Hervieux, S. & Wheatley, A. (ed.) (2020). The rise of AI: implications and application of artificial intelligence in academic libraries. Chicago, Illinois: Association of College and Research Libraries.

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29. Holmes, W., Persson, J. Chounta, I., Wassori, B. & Dimitreva, V. (2022). Artificial intelligence and education: a critical view through the lens of human rights, democracy and the rule of law. Strasbourg Cedex: Council of Europe. https://rm.coe.int/artificial-intelligence-and-education-a-critical-view-through-the-lens/1680a886bd
30. Honghai, G. C. (2020). Library reference services based on artificial intelligence. Villanova Journal of Science, Technology and Management, 2 (1), 53 - 60.
31. Ibegbulam, I., Eze, J. U. & Enem, F. N. (2015). An analysis of the health information needs and information seeking behavior of women in a Nigeria university: a self study. Librarianship in Africa Journal of Library and Information Science, 8 (1&2), 1 - 8
32. Igbokwe, J.C., Benson, O.V & Onyam, I.D. (2020). Nigerian academic libraries and the new dynamics in library and information services. In: Ezema, I. J., Attama, R.O., Echezona, R. I. & Ekere, F. C. (Eds.). Trends in academic library management: a book in honor of Prof. Benson Ezuikwu Edoka. Enugu: DeRafelo publisher
33. Igun, S. E (2013). Problems encountered by librarians in the utilization of ICTs in Nigerian university libraries. . Nigeria Libraries, 46 (2), 87-101
34. Izquierdo, H. A. (2022). Artificial intelligence and text and data mining: future rules for libraries. https://doi.org/10.1515/9783110732009-022.
35. Khanzode, K. C. A. & Sarode, R. D. (2020). Advantages and disadvantages of artificial intelligence and machine learning: a literature review. International science, 9 (1), 30 - 36.
36. Lemelin-Bellerose, S. (2019). Artificial intelligence: current situation, risks and outlook: Publication No.2019-06-E; Ottawa, Canada: Library of Parliament.
37. McNeal, M. L. & Newyear, D. (2013). Introducing Chabots in libraries. Library Technology Reports. https://journals.ala.org/index.php/ltr/article/view/4504/5281
38. Mess, J. A. (1991). Artificial intelligence in information services: revolution or survival? Proceedings of the IATUL conferences. Paper 8. https://docs.lib.purdue.edu/iatul/1991/papers/8.
39. Mohammad, S. M. (2020). Artificial intelligence in information technology. International Journal of Innovations in Engineering Research and Technology, 7 (6), 168 - 175.
40. Mohammed, Y. A. (2015). Assessment of print and electronic information services to undergraduate of federal university of Technology, Minna and Ibrahim Badamasi Babangida university Lapai libraries, Niger state, Nigeria 77-85
41. Nawaz, N. & Saldeen, M. A. (2020). Artificial intelligence chatbots for library reference services. Journal of Management Information and Decision Science, 23 (S1), 442 - 449.
42. Njuku, S. U. (2020). Application of expert systems in library and information services. Nigerian Academic Forum, 29 (1), 1-10.
43. Obiano, D. C., Onuoha, C. O., Adeoye, A. A., Nwosu, J. C. & Motunrayo, F. (2022). Aiding the exploration of artificial intelligence in Nigeria academic libraries in the 21st century. Information Technology and Librarianship, 2 (1&2), 1-13.
44. Okafor, P.O, Okey-Okafor, C. N. & Nwachukwu O. J. (2020). Public libraries: innovative service delivery in an information society for development. Compendium of Papers Presented during Nigerian Library Association, Anambra State Chapter 2020 Conference and Annual General Meeting.
45. Olayode, M. M. (2022). Role of technological innovations and adaptation of artificial intelligence in contemporary library service delivery. Conference Proceeding of the first Conference of the National Institute of Office Administrators and Information Managers (NIOAIM) between 7th and 10th February, 2022 at the University of Ibadan, Oyo State.
46. Onaolapo, S. & Onifade, T. (2020). Teaching and learning in the cloud: Prospects and challenges of artificial intelligence for education in Africa. https://ic-sd.org/wp-content/uploads/2020/11/Sodiq-Onaolapo.pdf
47. Ossai-Ugbah, N. B. & Ogunrombi, S. A. (2013). Library automation: experiences in Nigerian Universities. Nigeria Libraries, 46 (2), 1-10
48. Oyetola, S. O., Oladokun, B. D., Maxwell, C. E. & Akor, S. O. (2023). Artificial intelligence in the library: potential implications to library and information services in the 21st century Nigeria. DOI:10.2139/ssrn.4396138
49. Patil, H. P. (2018). Use of intelligent agent technology and artificial intelligence in libraries. International Journal of Science and Research, 9 (1), 1846 -1849.
50. Singh, A., Rai, P. & Singh, S. (2019). Scaling bots in libraries: trending aptness of artificial intelligence in information system. IN: Singh, R., Vijayakumar, V. & Jaswal, P. S. (2019). (Ed.). Transcending technology: a cognitive learning towards artificial intelligence. New Delhi: Satyann Books,pp. 205-211.
51. Singh, A., Rai, P. & Singh, S. (2019). Scaling bots libraries: trending aptness of artificial intelligence information system In: Singh, R., Vijayakumar, V. & Jaswal P. S. (Ed.). Transcending technology: a cognitive learning towards artificial intelligence. New Dehi Satyam books

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52. Singh, R., Vijayakumar, V. & Jaswal, P. S. (2019). (Ed.). Transcending technology: a cognitive learning towards artificial intelligence. New Delhi: Satyann Books.
53. Ugwuanyi, L. I. & Ogunsakin, A. J. (2015). Consolidating the gains of ICT in libraries from attitudinal perspective. Nigerian Library Link: A Journal of Library and Information Science 14 (1&2), 53 - 62
54. Umeozor, S. N. & Emasealu, H. U. (2022). Web technology in developing countries: the pathway for academic libraries in Nigeria. Journals of Library Services and Technologies, 4,(1), 31-,43.
55. Umeozor, S. N. & Ibegwam, A. (2022). Assessment of the traditional and emerging roles of university libraries in Nigeria. Journal of ICT Development Applications and Research, 4 (1/2), 85 - 95.
56. Umezor, S. N. & Emasealu, H. U. (2022). Web technology in developing countries: the path way for academic libraries in Nigeria. Journal of Library Services and Technologies, 4 (1), 31- 43.
57. Upshall, M. (2022). An AI toolkit for libraries. Insights, 35.
58. https://insights.uksg.org/articles/10.1629/uksg.592
59. Uwa, I. N. & Elonye, G. (2020). Provisions of digital information services to users of academic libraries in Ebonyi state Nigeria. Ebonyi Journal of Library and Information Science, 7 (1), 18 - 28
60. Wood, B. A. & Evans, D. (2018). Librarians perceptions of artificial intelligence and its potential impact on the profession. Computers in Libraries, 38 (1), 2018. http://www.infotoday.com/cilmag/jan18/Wood-Evans-Librarians-Perceptions-of-Artificial-Intelligence.shtml.
61. Wood, H. (). Health libraries and AI.
62. Yakubu, A. S., Yagana, A. A. & Umar, S. Y. (2023). Investigating librarian's intention to use artificial intelligence for effective library service delivery: a partial least square-structural equation modeling-based approach. Dutse Journal of Pure and Applied Science (DUJ OPAS) 9 (16), 1-14.
63. Yakubu, A. S., Yagana., A. A. & Umar, S. Y. (2023). Investigating libraries intention to use artificial intelligence for effective library services delivery a partial least square-structured equation modeling based approach. Dutse Journal of Pure and Applied Science (DUJOPAS, 9(1b),
64. Yeboah, K. (2020). Artificial intelligence (AI) and inclusive innovation: examining contemporary AI initiatives in Sub-Saharan Africa. A thesis submitted to the Faculty of Arts, University of Alberta

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