



REVIEW

Artificial intelligence in the library: gauging the potential application and implications for contemporary library services in Nigeria

Inteligencia artificial en la biblioteca: calibrando la aplicación potencial y las implicaciones para los servicios bibliotecarios contemporáneos en Nigeria

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ABSTRACT

Purpose: libraries may become obsolete in the twenty-first century unless they begin to harness new technology and improve information and service delivery. This paper examines the potential application and implications of artificial intelligence for contemporary library services in Nigeria.

Methods: this paper adopts the expository research approach to evaluate the application and implication of artificial intelligence in contemporary library services in Nigeria. Through systematic analysis of literature, the study addresses how academic libraries can utilize artificial intelligence to support innovative library services.

Findings: the column emphasizes that, academic libraries in Nigeria have not yet adopted and applied AI, in spite of the potential that it holds for libraries. Given that there has been relatively little study linking artificial intelligence (AI) to librarianship, this may be because there is a low degree of awareness and adoption of AI's importance in libraries.

Conclusions: this column is the original idea from the authors and does not reflect on any copyrighted materials. The column recommended that, academic libraries in Nigeria should fully embrace artificial intelligence like chatbots, barcodes, RFIDs, and robots for delivering quality services and libraries should also leverage on the opportunities presented by artificial intelligence to reconnect their remote users, and consequently re-establish their relevance among the user community.

Keywords: Artificial Intelligence; Library Services; Robotics; Machine Learning; Technology; Academic Libraries; Nigeria.

RESUMEN

Propósito: las bibliotecas pueden quedar obsoletas en el siglo XXI a menos que empiecen a aprovechar las nuevas tecnologías y a mejorar la información y la prestación de servicios. Este artículo examina la aplicación potencial y las implicaciones de la inteligencia artificial para los servicios bibliotecarios contemporáneos en Nigeria.

Métodos: este trabajo adopta el enfoque de investigación expositiva para evaluar la aplicación y las implicaciones de la inteligencia artificial en los servicios bibliotecarios contemporáneos en Nigeria. A través de un análisis sistemático de la literatura, el estudio aborda cómo las bibliotecas académicas pueden utilizar la inteligencia artificial para apoyar servicios bibliotecarios innovadores.

Resultados: la columna hace hincapié en que, las bibliotecas académicas en Nigeria aún no han adoptado y aplicado la IA, a pesar del potencial que tiene para las bibliotecas. Dado que ha habido relativamente pocos estudios que relacionen la inteligencia artificial (IA) con la biblioteconomía, esto puede deberse a que existe un bajo grado de concienciación y adopción de la importancia de la IA en las bibliotecas.

Conclusiones: esta columna es una idea original de los autores y no refleja ningún material protegido por derechos de autor. La columna recomienda que las bibliotecas académicas de Nigeria adopten plenamente la inteligencia artificial, como chatbots, códigos de barras, RFID y robots, para prestar servicios de calidad, y que las bibliotecas aprovechen las oportunidades que ofrece la inteligencia artificial para volver a conectar a sus usuarios remotos y, en consecuencia, restablecer su relevancia entre la comunidad de usuarios.

Palabras clave: Inteligencia Artificial; Servicios Bibliotecarios; Robótica; Aprendizaje Automático; Tecnología; Bibliotecas Académicas; Nigeria.

INTRODUCTION

Over the years, advances in digital technology have significantly changed how traditional library work is done. Academic and research libraries all around the world have wired and incorporated technology into all of their internal operations and activities, and developing nations like Nigeria are not falling behind in this race. Technology integration into library services is not a recent development in Nigeria. Nigerian libraries have not lagged behind in the adoption and deployment of technological advancements to improve library operations and services over the past twenty years or so. Computer systems, scanning and printing equipment, electronic resources, CCTV cameras, social media, and most recently the use of RFID technology are examples of such technologies. Yet, the use of cutting-edge technology like artificial intelligence has not really taken off.

The application of artificial intelligence in libraries can be viewed as a collection of cutting edge technologies that have given libraries access to machines that can sense, comprehend, act, and learn. One emerging trend in libraries is the use of cutting edge technologies, making librarianship a profession known for doing so.⁽¹⁾ The fourth industrial revolution has been called artificial intelligence.⁽²⁾

AI are machines that have human-like reasoning, decision-making, learning, and interpersonal skills.⁽³⁾ Holmes et al.⁽⁴⁾ claim that AI can be thought of as computer programmes that perform jobs that would normally require intellect from humans.

Nearly every area of global civilization is now clearly displaying applications of artificial intelligence. In many institutions and service organizations, it has resulted in transformations and new competitive advantages. As a result, AI has been shown to be very beneficial and practical in many fields, such as security and surveillance, banking and finance, marketing, managing healthcare, and smart applications (such as facial recognition, voice recognition, location assistant, etcetera). Artificial intelligence (AI), like in many other fields as described above, may help libraries update and expand their services as well as promote their relevance in the modern digital world. Libraries can make the most of AI's potentials, according to ExLibris⁽⁵⁾ and can also take advantage of the "opportunity to leverage the available practical benefits of artificial intelligence for their own objectives: optimizing workflows, maximizing operational performance, and developing new services."

Libraries were once known to solely collect, handle, preserve, and disseminate printed materials. Its function has altered in recent years, though. Contemporary libraries are transitioning from being a repository of printed information resources to a provider of digital services.⁽⁶⁾

The widespread use of computer systems, ongoing reliance on computer networks, quick development of the web and Internet, as well as an increase in the quality and quantity of information, may all be credited with this development. Several libraries have been compelled to adopt new methods of information storage, retrieval, and dissemination as a result of this. A network of libraries has been created as a result of the modernization of libraries and information centers from analogue to digital information hubs. This tactic aids in the production, sharing, and utilization of resources at multiple levels. ICTs are now utilized to both provide and access electronic sources, including electronic journals, online and CD-ROM databases, web-based information resources, and many sorts of electronic information resources.⁽¹⁾

The University of Lagos was the first institution in Nigeria to use artificial intelligence thanks to a contribution from Platform Capital in June 2020. The robots, which are "cloud-based intelligent humanoid robots," according to the description provided by Roboscholar, "have the following features: face recognition, surveillance technology, Open API, data management, advert & promotion, book shelf management, research, customizable, and entry validation".⁽⁷⁾

The most practical way to achieve new goals and objectives in today's wireless and connected world is to integrate cutting-edge novel technologies into routine library operations. Every effort is being made by libraries and librarians to keep up with the trend in the digital age. It's interesting to note that the majority of AI functions are already widely used in word processing or web and mobile application search (such as auto-

suggest, relevance ranking, auto-recommendation, bookmarking, and personalization) (autocomplete, spell-checking, translation, voice recognition). To make library services more interactive and user-friendly, several qualities can be incorporated. The use of AI in libraries ensures that knowledge is accessible fast and in novel ways. An example of this is using voice commands to search for information.

ICT is a major driver of the current information environment. In order to provide innovative and cutting-edge information services that satisfy the consumers' shifting needs, there is a high level of dependence on new technological developments. Adoption and integration of cutting-edge technologies like artificial intelligence are required for libraries to efficiently offer effective information services that match the demands of the modern world. The fact that many academic libraries in Nigeria are not fully utilizing the benefits of AI for efficient service delivery to both local and remote users, however, is concerning. In order to support the delivery of high-quality and efficient services to students, researchers, and staff, this study seeks to investigate the potential areas where academic libraries might use AI.

AI application in academic libraries

According to CILIP⁽³⁾ new technologies are changing global practices and generating a paradigm shift in all spheres of life in addition to having an impact on people's day-to-day experiences. Traditional roles are undergoing significant changes that call for new skills, opportunities, and challenges. In the present day academic library setting, this new change is affecting the general service provision, the librarians and their functions.

By conceptualizing and following the development of AI, Yusuf et al.⁽⁸⁾ evaluated the implementation of artificial intelligence for efficient library services in Nigerian academic libraries. The study confirmed the advantages of using AI for library tasks. These advantages include ease of use, limitless functions and capacities, the capacity to carry out challenging jobs, etc. It also addressed the challenges library management faces when implementing AI, including: insufficient funding, technological hurdles, job loss, etc. The authors' conclusion emphasized that using artificial intelligence in libraries and information centers is setting new benchmarks for providing effective and efficient services in libraries. Unfortunately, due to the issues previously mentioned, there is a poor utilization of AI technology in academic libraries in developing nations.

Academic libraries are most likely to see beneficial changes in information service delivery as a result of the integration and use of AI in the information business.⁹ Nowadays, many libraries in wealthy nations use robotics and AI directly in their daily operations. AI can be applied in the following areas:

- Robots: this is an AI-enabled or automated machine that is configured to complete particular activities with or without human assistance. This could involve using robotics to retrieve books from shelves, such as the automatic arm or robots that can take them up from libraries.⁽¹⁰⁾
- Chatbots: an artificial intelligence (AI) software or application known as a chatbot can simulate a conversation (or a chat) with a human being in natural language via a messaging app, a blog, a website, a mobile app, or a smart device. Voice assistants and chatbots can be utilized for library services.^(11,12) The basic aspects of library operations have also been affected by AI technology, as is currently the case in other spheres of life. Chatbots can be used to inform users of new arrivals and when a book loan is due, alert users to new arrivals, and direct users to similar materials, among other things.
- Application of machine learning to library resources, such as picture identification, speech recognition, etc.⁽¹³⁾
- Adoption of AI in teaching, learning and research in public and school libraries.⁽¹⁴⁾
- Robots can also be helpful for automated storage and retrieval systems, which have facilitated the management of library space.⁽¹⁵⁾
- Robots increase the operational effectiveness of libraries by enhancing collection analysis, visualization, preservation, and lowering service delivery costs.⁽⁶⁾
- In libraries, robots are used to browse printed materials in real-time via a Web interface. A robot is dispatched to retrieve the needed object when the user activates the system.⁽⁶⁾

Similar to how libraries and information centers are using AI, big data and data analytics are being used for both operational and service-oriented purposes.⁽¹⁶⁾ With assistance from partners or funding organizations, libraries in impoverished nations can also implement all of these. This will help to improve the efficiency and effectiveness of library service operations in this information-rich and digital economy.

Implications AI to Nigerian Academic Libraries

Before today, many university libraries in Nigeria had difficulty implementing cutting-edge technologies like artificial intelligence into their core offerings. Nonetheless, COVID 19 has increased the demand for the use of cutting-edge technologies to support library service operations. As a result, there are numerous reasons why academic libraries in Nigeria need to apply artificial intelligence, including:

- Change in user behavior and information landscape.
- Rise in global health crisis creating boundary between physical meetings.

- Other advancements in the digital revolution include the usage of smart Internet-enabled gadgets, the use of digital high-tech equipment in homes, the introduction of AI assistants in everyday life interfaces, the development of keyless and nearly self-driving cars, and others.⁽⁹⁾
- Since technology is altering user expectations, there is a lot of discussion among librarians about the need to provide new services to users. Also, with the introduction of COVID-19 and the ensuing safety protocols, librarians all over the world are starting to understand the advantages of cutting-edge technologies in efficient library service delivery. Many advantages can be gained from the deployment of artificial intelligence, particularly in the library and information work, according to a critical examination of the AI literature. The development of library character and honor, collaborations, system upgrades, mastery of processes and digitization, collection of current descriptive metadata as a by-product from project outcomes, improved user experience, and efficiency in library operations are just a few of the advantages listed by Ridge.⁽¹⁷⁾

Challenges of AI application in Nigerian libraries

The complete implementation of cutting-edge technology like artificial intelligence in library and information work is hindered by a number of problems and difficulties. Academic and research libraries in Nigeria frequently encounter these problems. CILIP⁽³⁾ and other organizations have called attention to some of the difficulties that come with implementing AI in libraries. Copyright and intellectual property rights (IPR), the General Data Protection Regulation (GDPR), the cost of working at scale, the reintegration of project data into systems, a lack of management / executive support, insufficient budget and funding, an inability to keep up with the increasing trend in new technologies, and the difficulty of implementing new technologies are a few of these, among others.

Similar studies by Stiglitz et al.⁽¹⁸⁾ asserted that employment polarization or job losses may emerge from the growth of AI technology. As a result of automation, the use of AI may cause inequality to significantly increase. According to the World Bank⁽¹⁹⁾ underdeveloped nations may be less willing to adopt technology since AI will bring a high rate of job losses. The analysis predicts that adoption of AI will result in job losses of 69 % in India, 72 % in Thailand, 77 % in China, and 85 % in Ethiopia. Together, these studies demonstrate that AI has the potential to result in both job losses and significant employment destruction. According to Yusuf et al.⁽⁸⁾ there are a number of challenges associated with implementing artificial intelligence in academic libraries, including a lack of adequate infrastructure, emerging skill gaps, job loss, an unstable power supply, and an increase in the number of alternative sources of information. Yet, the introduction of artificial intelligence would lessen the demand for human participation in a number of library functions.

CONCLUSION AND RECOMMENDATIONS

The traditional work duties of library and information professionals are being impacted by artificial intelligence, which is also transforming the overall information landscape of libraries around the world. Artificial intelligence 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. Only one academic library (the University of Lagos Library) in all of Nigeria has successfully adopted and used artificial intelligence for library services, according to studies of the literature. Although the likelihood of AI adoption in libraries is strong, libraries must put forth a lot of effort and money to ensure the successful uptake of this cutting-edge technology. Despite this, Nigerian libraries are urged to adopt AI in order to support high-quality service delivery and maintain their relevance in this intensely competitive information economy. Using the potential of AI will significantly help Nigerian libraries and librarians meet the needs of this digital generation because they can no longer claim ignorance of the trend in changing user behavior and their developing information needs. Based on this, this column recommends that:

- For the purpose of providing top-notch services, academic libraries in Nigeria should fully adopt artificial intelligence technologies including chatbots, barcodes, RFIDs, and robotics.
- Also, libraries should take advantage of the potential provided by artificial intelligence to reconnect with their distant users and thereby reclaim their relevance within the user base.

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