

Integration of Artificial Intelligence in Library Operations: Opportunities and Challenges (A Case of Kenneth Dike Library, University of Ibadan)

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Abstract

This study is about how AI (Artificial Intelligence) was incorporated into the processes of Kenneth Dike Library in the University of Ibadan. The study highlights the areas through which AI was adopted, the benefits that were anticipated, the hurdles that were experienced, and the readiness of the users and staff. The appraisal of the increasing importance of AI in academic libraries called for an assessment of how far the library has gone in the use of AI-driven tools for the management of resources, automation of processes, support for researches, and the improvement of the overall user experience. The survey design for research was used in this study where data was collected from library staff and users of the library with the aim of having a thorough understanding of the present application of AI and the readiness for more adoption. The results show that the library has incorporated AI to a moderate level, especially in the fields of resource management, cataloging, discovery tools, and chatbot services, but there is still a lot of room for growth. Respondents were quick to point out various ways AI can be implemented to make the library more efficient, to provide users with information better suited to their needs, to reduce the time taken for information retrieval, and to add more value to research through support. However, the library could not do anything about the issues that came up, and their root causes were improper financing, the lack of the required technical know-how, poor ICT infrastructure, a lack of management support, and the resistance of some staff to change. These reasons together limit the library's capability to get AI technology to its full usage for service quality improvement. The research also indicated that the promptness of staff and users is a bit over fair, but still needs to be worked on. There is a moderate level of awareness of AI tools and also a general willingness to adopt them; however, there are still gaps that need to be filled in terms of technical training and structured implementation planning. It is therefore recommended that the library invest continuously in training its staff, building their capacities, and developing infrastructure, as well as come up with a comprehensive AI adoption strategy. Not only would the above measures tackle the issues that have been raised, but they would also make Kenneth Dike Library a trendsetter in the provision of AI academic library services in Nigeria.

Keywords: Artificial Intelligence, Library Operations, Academic Libraries, Opportunities, Challenges

Citation

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Introduction

Using Artificial Intelligence (AI) in libraries has proven to be a breakthrough in the field of librarianship, offering new and innovative ways to enhance service delivery and user experience. Libraries worldwide are transitioning to smart library models, and academic libraries in Nigeria are gradually adopting AI technologies to streamline functions such as cataloging, information retrieval, and user interaction (Bakare, 2023). Out of all the academic libraries in Nigeria,

KDL was the one selected for the case study because of its increased use of AI tools along with its teaching activities, which put the library as a top example of AI use in the academic libraries of Nigeria. Integration of AI is very important for KDL as it aligns with the library's mission to provide efficient, user-centered, and tech-supported information services.

Among the AI tools that should be adopted by libraries are chatbots, automated indexing systems, and predictive analytics. The latter provides

academic libraries with personalized services, optimized workflows, and enhanced access to information resources. These advancements in technology allow libraries to get rid of some of their day-to-day activities so that the librarians can devote more time to helping researchers with their advanced studies and involving more staff in generating insights based on users' behaviors and information needs (Arumuru, 2020). For KDL, the use of AI is a must from the outset as it would not only improve operational efficiency, but also enhance the library's capacity to cater to the diverse academic and research needs of its users in a more responsive manner.

Moreover, AI has become one of the key drivers for virtual reference assistants and recommendation systems to increase user satisfaction and enhance engagement. One of the most popular uses of AI is through the implementation of chatbots that can serve as reference staff 24/7, letting them answer user questions quickly and so easing the burden on the staff of the library who are not plentiful anyway (Okunlaya et al., 2021). Similarly, suggestion systems can also create a friendly environment for users as they can help in the discovery of relevant resources by letting users know what materials are available that suit their preferences and the way they search, thus leading to enhanced research and learning (Akande & Popoola, 2022). The library of KDL is already in a situation where the demand for quick and efficient information services is increasing, and AI is therefore a crucial component in the library's efforts to close service gaps and provide uninterrupted resource access.

On the other hand, the implementation of AI in Nigerian colleges and universities, KDL included, is still far from its full potential due to the fact that the libraries' physical and financial capabilities are still quite poor. Poor internet connection, unreliable power supply, and obsolete tech hinder the libraries' full utilization of AI (Bakare, 2023). Some comprehensive research and academic libraries do not have the necessary advanced hardware and software that, can support AI applications which would need constant connectivity and considerable computing power (Oluwasanu et al., 2019). Moreover, the high cost

of purchasing and running AI technologies further prevents their widespread deployment, particularly in places with very limited budgets, which in turn impacts the longevity of KDL's AI projects.

Insufficient AI-related skills is yet another major problem that library staff face as a result of the slow adoption of AI in academic libraries. Research shows that a large number of librarians in Nigeria have very little contact with new technologies and this in turn has a negative impact on their ability to handle and use AI tools effectively (Arumuru, 2020). The lack of technical skills is sometimes accompanied by an unwillingness to accept technological change, as some librarians see AI as a rival rather than a helpful tool (Okunlaya et al., 2021). KDL needs to take care of this issue as AI deployment hinges on the staff's ability, adaptability, and acceptance of technological innovation.

There are also ethical aspects raised with regard to the use of AI in libraries. One of the main concerns of AI technologies is the amount of user data they need in order to deliver personalized services. This brings up the issue of data confidentiality and security, especially in Nigerian universities where such frameworks might be rather weak (Bakare, 2023). Moreover, the problem of bias in algorithms can cause some users to have an easier time accessing certain information resources than others, which negatively affects the fairness and inclusivity of the libraries' service (Akande & Popoola, 2022). Therefore, KDL needs to have in place transparent AI policies and ethical guidelines that take care of data security, responsibility, and equal information access.

Nigerian academic libraries and KDL in particular must make it a point to overcome these barriers through decisive planning and cooperation if they were to enjoy the benefits of AI in full. The establishment of joint ventures and the provision of international grants could be a means of securing funding for the implementation.

Concept of Artificial Intelligence in Library

Artificial Intelligence in Library is an important topic among library professionals. In general,

libraries are people-centered services and thus everything that is done with AI in the library field should be done keeping in mind the users' needs. Nevertheless, AI could bring about substantial changes within the library sector, especially in the world's developing regions like Nigeria where the academics suffer from poor library services which eventually leads to restricted academic growth and researches. Undoubtedly, these changes will lead to a positive future for libraries and overall research development in Nigeria in the long run. Actually, with predictive search, automated indexing, and virtual assisting technologies, Nigerian libraries have already opened up a door to the future by applying AI (Bakare, 2023). Nowadays, the usage of AI extends not only to the processes of library operation but also to building better relationships with users through data analysis. Expectedly, AI could suggest the most appropriate materials by looking through the users' behavior or even gradually optimizing the process of collection development thus librarians would be able to acquire the number of books or journals that the students and researchers require for their studies and research (Akande & Popoola, 2022). As for Nigeria, it is quite common for most libraries to have limited resources, hence AI being a cheaper alternative to improving the quality of service even when there is little staff and infrastructure available. However, for AI technology to perform its magic beside humans, the issues of data being protected, the right of people having access to data should be won through a comprehensive understanding of the technology's capabilities first (Okunlaya et al., 2021).

AI has been integrated in Academic Library Operations

The integration of AI in the operations of academic libraries in Nigeria involves the application of intelligent systems in sorting, circulation, and assistance in user services so as to enhance the respective services and make them more convenient. AI applications such as automated metadata generation and intelligent search engines make the resource discovery process easy, hence allowing users to find the needed materials fast and correctly (Bakare, 2023). One such situation is the

use of AI-enabled chatbots which can cater to the users' needs all day and help them with the electronic resources which is a real plus for libraries with a low number of staff (Okunlaya et al., 2021). This automation of library work does not only keep the library functioning but acts also as a support to the academic activities giving easy and smooth access to information for both students and researchers.

On the contrary, AI use in Nigerian libraries is and will always be subject to the infrastructural and technical challenges for a long time to come. The majority of academic libraries do not possess such a strong hardware, internet that is dependable, and trained staff that is ICT literate so that the application of AI technology can be done efficiently (Arumuru, 2020). The steps in training librarians in AI tools and investing in cloud-based platforms to make them more dependent on technology will be very important for the integration to be realized. By implementing AI technology with a gradual approach and formation of partnerships with IT companies, libraries in Nigeria will not only increase operational efficiency but also lessen the manual work involved and hence able to serve the public which is in line with the global trend towards modernization of libraries (Bakare, 2023). The objectives of the Study is to: analyze how far the Artificial Intelligence technology has penetrated the operations of Kenneth Dike Library, University of Ibadan; explore the possible chances and gains AI will provide in the area of enhancing academic library services; pinpoint the main obstacles that Kenneth Dike Library faces with AI adoption and deployment and perceive the degree of preparedness among users and staff for the acceptance of AI in the library services.

Methodology

The use of descriptive survey research was adopted. The researcher decided that this design was most fitting for this study as it allows for data to be collected directly from respondents via a structured questionnaire in order to gain insights into their views, experiences, and readiness regarding the use of AI in library functions. This

method also supports the investigation of trends, patterns, and relationships amongst variables that are associated with the study.

Population of the Study

The population is the set of individuals or entities that were relevant to the research focus. In this case, the population consists of all professional and non-professional staff of the Kenneth Dike Library (KDL), University of Ibadan. This category includes librarians, library officers, and other technical staff who are directly or indirectly involved in library services. The total number of 74 library staff members is currently working there.

Sample Size and Sampling Technique

The population (74 staff members) was chosen to be the sample size using the total enumeration (census) sampling method. The reason for this was that the population is small enough to manage and that all professional and non-professional staff's input is crucial for a proper understanding of the AI. Every staff member had the same chance to participate, which will help to reduce bias and increase the trustworthiness of the findings.

Results and Discussion of Findings

This presents the discoveries and function of Artificial Intelligence (AI) in the enhancement of

library operations and service delivery at the Kenneth Dike Library (KDL), University of Ibadan. The discussion was based on the answers received from a total of seventy-four (74) library staffers, which aimed to understand the current situation in AI integration, the benefits perceived, the challenges faced, and the level of readiness for AI-driven services within the library. The outcomes are compared with existing literature and Nigerian academic library characteristics and realities.

Extent of AI Integration in Library Operation

Results show that AI integration at the Kenneth Dike Library is still in the developing stage. Although most AI-related tools and digital systems are utilized, in particular, online catalogs, electronic databases, and minor annuals, the total adoption of advanced AI applications is almost nil. Main library functions like cataloging, circulation, reference services, and administration rely heavily on conventional or semiautomatic systems. This indicates that AI employment at KDL is still more exploratory than widespread. This level of integration is in agreement with earlier studies that have depicted AI adoption in Nigerian academic institutions as slow and sporadic, mainly due to infrastructure and institutional constraints (Bakare, 2023).

Table 1: The extent to which Artificial Intelligence has been integrated into the operation of Kenneth Dike Library, University of Ibadan

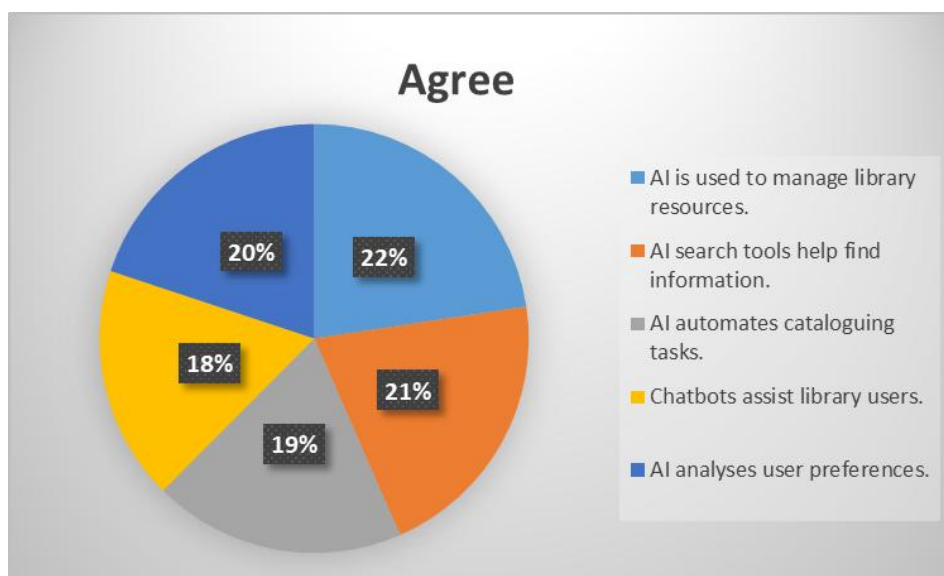
Questions	Agree	Disagree
AI is used to manage library resources.	50	24
AI search tools help find information.	46	28
AI automates cataloguing tasks.	42	32
Chatbots assist library users.	39	35
AI analyses user preferences.	44	30

The results show that staff, in large part, had recognized the application of AI in the

management of library resources (50) and enhancement of search functions (46). This implies

that AI integration has already taken root in the areas through which library operations are basically performed, i.e., resource organization and information retrieval. On the other hand, the lack of consensus on AI for cataloguing (42) and virtual

assistant (39) suggests that such technologies might still be at the initial stages of development or not evenly distributed in their usage in different departments.



The replies equally indicated the use of AI for user preference analysis with a moderate agreement of 44, which indicates a gradual but just not full application of AI-driven analytics. The rather considerable amount of disagreements on some items implies differences in or lack of knowledge

among the personnel regarding AI. This is a sign that investing more, training the staff, and supporting through policies are necessary to incorporate AI entirely into every operational area of the Kenneth Dike Library.

Table 2: Potential opportunities and benefits AI presents in enhancing academic library services

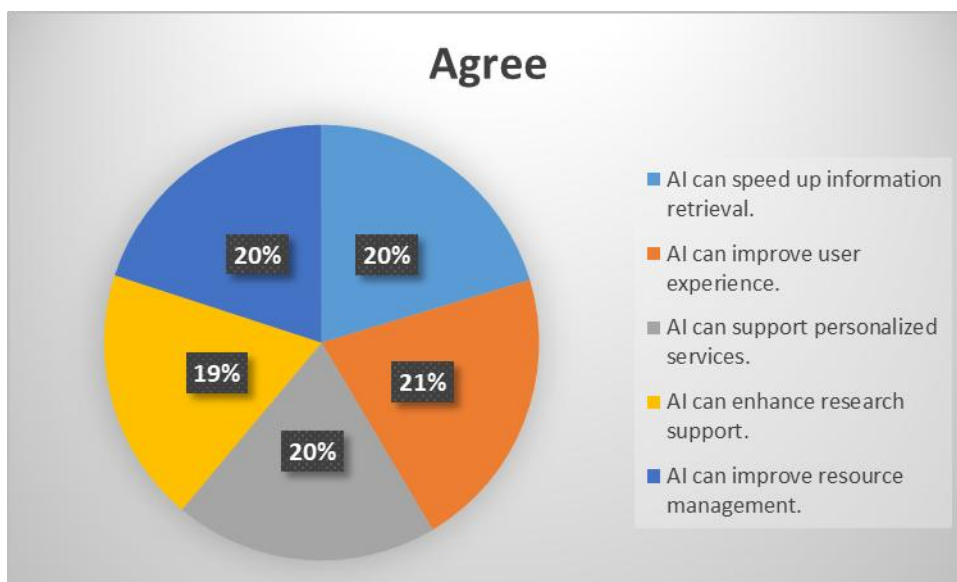
Questions	Agree	Disagree
AI can speed up information retrieval.	56	18
AI can improve user experience.	58	16
AI can support personalized services.	54	20
AI can enhance research support.	52	22
AI can improve resource management.	55	19

The findings reveal that the library staff are very much in agreement regarding the advantages that AI might offer in the enhancement of library services. The top point of consensus (58) was under

the heading of the user experience improvement, which points to the fact that the staff regard AI as a tool that would make the library interactions smoother and more efficient. Likewise, the use of

AI for speeding up information retrieval (56) and for improving resource management (55) received considerable support, which is an indication that AI is perceived to be advantageous both for the users and for the internal operations. Personal services

(54) and improved research support (52) also gained considerable agreement, which indicates the awareness of the role of AI in customizing services to individual needs and in facilitating academic work.



The lower number of disagreements indicates that the majority of the staff, however, are positive regarding AI's ability, still, they perceive it to be a limited implementation in the present times. Discrepancy in agreement levels might be due to differences in understanding how AI could be used

in certain fields, like, research support. This shows that training and awareness campaigns are needed for the staff to realize and reap the benefits of AI fully, so, the future AI adoption will be strategic, user-centered, and in line with the library's academic mission.

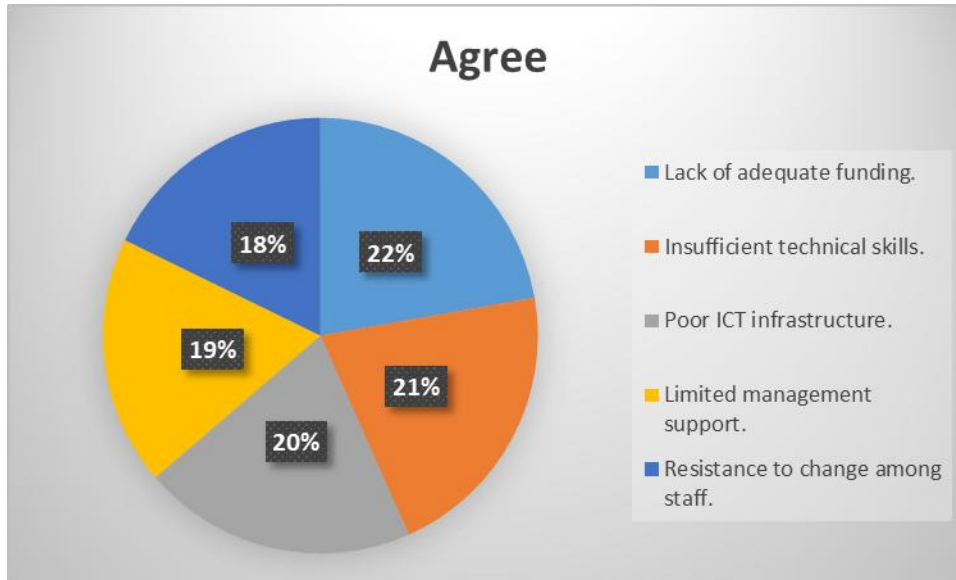
Table 3: The key challenges facing Kenneth Dike Library in adopting and implementing AI technologies

Questions	Agree	Disagree
Lack of adequate funding.	60	14
Insufficient technical skills.	57	17
Poor ICT infrastructure.	55	19
Limited management support.	50	24
Resistance to change among staff.	48	26

The data disclose that insufficient funding (60) is the major challenge with cost as the main reason why AI is not adopted. Next in line are insufficient skills (57) and poor technology (55) signifying

human and hardware resources as the main constraints. Thereafter comes lack of management support (50) and organizational resistance (48) which implies that the company's culture and the

leadership's commitment are also factors that slow down the adoption of AI technology.



The results indicate a challenge with many aspects: although the technology is available, its complete implementation needs a mix of factors such as money, training of workers, and changing the way

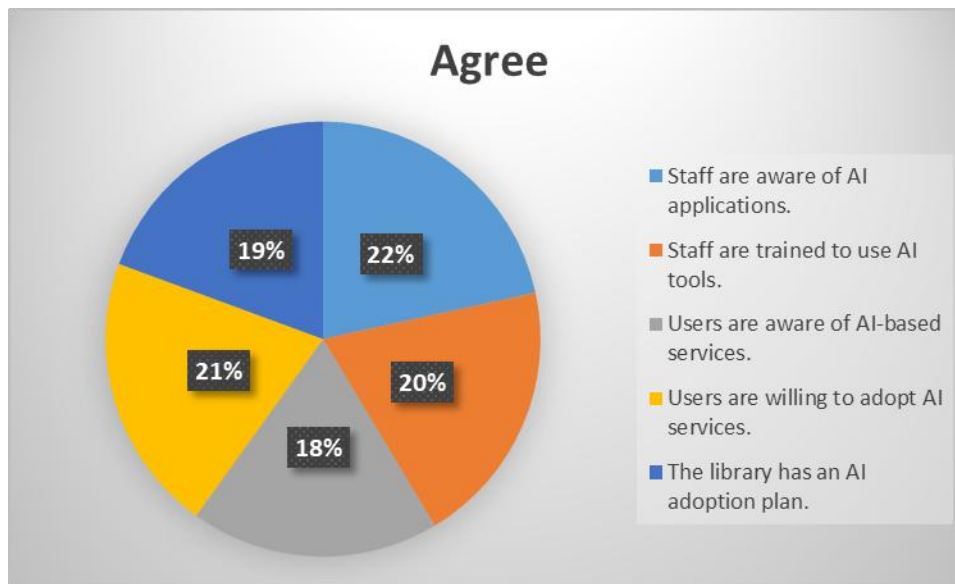
the organization thinks. If these interconnected difficulties are not solved, the incorporation of AI in Kenneth Dike Library will probably remain to be a gradual and fragmented process.

Table 4: The level of staff and user preparedness for the adoption of AI in library services

Questions	Agree	Disagree
Staff are aware of AI applications.	49	25
Staff are trained to use AI tools.	45	29
Users are aware of AI-based services.	42	32
Users are willing to adopt AI services.	47	27
The library has an AI adoption plan.	44	30

The study concludes that both staff and users are moderately prepared. Staff's knowledge of AI tools (49) is quite high, but still, fewer of them have been trained to operate these tools (45), implying that there is a significant difference between being aware of something and being able to use it. On the

user side, the level of awareness (42) and the openness to use AI services (47) indicate that there is interest, but this interest might not be the case of effective use unless a proper orientation is provided.



The fragmentation of opinion regarding a formal AI adoption plan (44) that is revealed by the relatively low agreement points to a strategic weakness. The absence of a definite roadmap may result in the AI integration efforts being directionless, inconsistent, and lacking in measurable outputs. The reinforcement of preparedness would necessitate training, awareness, and implementation strategies on a large scale.

Conclusion

The study's results indicate that the University of Ibadan's Kenneth Dike Library has adopted Artificial Intelligence (AI) in a limited but moderate way. Even though the adoption is considerable in the areas of resources management, search tools, cataloguing automation, and user assistance through chatbots, the AI potential was not fully realized and there is still some room for improvement. The data reveal that the library acknowledges AI's contribution to the improvement of its m=efficiency, but the latter is not yet to the fullest extent.

One interesting aspect of the research is the fact that people have a very positive opinion regarding AI. Moreover, they especially believe that speeding information, retrieval, improving user experience, and supporting services are among the main advantages of AI. Opportunities explored could

even revolutionize library service delivery and put the library at the forefront of modern academic demands. However, the presence of some challenges like funding, unqualified staff, poor ICT infrastructure, limited management support, and resistance to change among staff poses significant barriers to AI adoption

Also, findings show that there is a positive attitude of both staff and users towards AI integration, but achieving sustainable implementation will require slow and steady investment in staff training, infrastructure improvement, and strategic planning. If these targeted interventions are not made, the library will have a hard time realizing the full potential of AI, and that is the delivery of academic services that are of high quality.

Recommendations

- i. The management of Kenneth Dike Library should make it a point to put staff training and capacity building at the top of their investment list so that both technical and non-technical employees will be able to operate AI tools with efficiency. This can be done by having regular workshops, organizing hands-on training sessions, and working together with AI technology providers.

- ii. The university administration should allocate more funds and upgrade the ICT infrastructure in order to adequately support the services that are AI-driven. This encompasses not just improving internet access but also procuring state-of-the-art hardware and software, and coming up with an all-inclusive AI adoption plan that has clear implementation steps and measurable outcomes.

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