REVOLUTIONIZING THE INFORMATION RETRIEVAL: EMPOWERING LIBRARIANS THROUGH AI TOOLS IN THE RECENT AGE

Mateen Shahid[1], Muhammad Naushad Sabzwari[2], Fauzdar Khan[3] and Lareb Inam[4]

Abstract

Purpose: This paper examines the revolutionary impact of artificial intelligence (AI) technologies in recent age. Furthermore, it analyses how AI tools enable library professionals to transform information sharing and access, how much library experts utilize AI tools, and what obstacles LIS professionals must overcome to incorporate artificial intelligence devices into their daily operations.
Research Methodology: Quantitative research design was used to justify the objectives of this study. An online survey was used as a research instrument. The targeted population was LIS professionals working in the university libraries of Lahore.
Results: The results indicate that most respondents discovered that using AI tools improved information retrieval, improved processes, and reduced the manual labour they had to do at work. The use of AI technologies in libraries was not without some challenges though, including budget constraints, reluctance toward change, and training difficulties. However, the participants' remarks on how AI-based technologies impact knowledge retrieval were favourable. Artificial intelligence (AI)-powered solutions have been recognized for their capacity to help individuals, improve information dissemination efficiency, increase flexibility to changing needs, expedite procedures while maintaining accuracy, and improve user experience by making the work easier. Although AI can greatly improve information retrieval productivity and performance, it still faces several obstacles, such as a shortage of funds, organization support, and field expertise. To overcome these obstacles and optimize AI's potential to enable librarians to provide better services to their audiences in the digital era.
Practical implementation: Librarians may benefit from the research by gaining insights into the evolving landscape of their profession. The study could highlight areas where professional development opportunities related to AI literacy and skills training may be necessary for librarians to adapt to the changing technological landscape.

Keywords: Artificial Intelligence, Information Retrieval, Library technologies, AI-based tools, AI in Libraries, Revolutionizing Information Retrieval, Empowering Librarians

Introduction

AI is transforming many industries by automating cognitive tasks that were historically assumed to be the realm of intellect and reason (Rashid and Kausik, 2024). Libraries have adopted AI technologies to redefine their traditional functions, improve service quality, and make the service delivery delightful. The use of machine learning and deep learning methodologies makes it possible for smart tools to perform tasks such as cataloguing, indexing, and information searches, by which librarians can dedicate more time to value-added services (Barman, 2025).

AI is not limited to library operations; it also affects how users engage with a library. Conversational interfaces through artificial intelligence, such as chatbots and virtual assistants, assist patrons in real time, directing them to resources and answering questions (Rane et al., 2024). Such tools disintermediate services and enhance access to library resources making them easily accessible and easily retrievable. Moreover, they form user preferences and recommend resources which makes libraries adaptive and pro-client, as argued in Sa'ari (Sahak et al. 2023).

[1] Dept. of Lib. and Info., Minhaj University Lahore. Email: mateenshahid505@gmail.com
[2] Associate Professor, Dept. of Lib. and Info., Minhaj University Lahore
[3] Lecturer, Dept. of Lib. and Info., Minhaj University Lahore
[4] PhD Student, Dept. of Lib. and Info., Minhaj University Lahore

Also, it helps in digitising and facilitating the preservation of significant documents for future generations (Jain et al., 2024). This integration of AI in libraries is continuing to revolutionise the profession and is changing the scope of librarianship from only the management of typed documents to the provision of digital information resources. Given how rapidly AI is shaping up, its impact on libraries will become even more profound over time, as AI enables new levels of potential in terms of resource organisation, preservation, and of engagement with users. This shift to the incorporation of advanced technologies such as AI in the annals of library science serves to reinstate its relevance in the ever-technologizing society.

Purpose of the study

The research topic "Revolutionizing the Information Retrieval: Empowering Librarians through AI Tools in the Modern Age" is to investigate and propose innovative solutions that leverage artificial intelligence (AI) to transform how librarians manage and retrieve information in contemporary library settings. This research addresses the evolving challenges librarians face in an era of rapidly advancing technology, where the volume and complexity of information resources demand more efficient and effective retrieval methods.

Objectives

The objectives of the study were to:

1. assess the effectiveness of AI tools in empowering librarians to revolutionize information retrieval and dissemination
2. evaluate the level of utilization of AI-based information retrieval tools by librarians and its impact on their performance
3. identify the challenges faced by LIS professionals in the integration of AI tools

Research Questions

1. What type of AI-based tools are used by librarians in library settings?
2. What is the level of utilization of AI-based information retrieval tools by librarians?
3. What is the impact of the use of AI tools on workflow and professional performance?
4. What are the challenges faced by LIS professionals in the integration of AI tools?

Review of Literature

In light of the existing literature, this study aims to assess the effectiveness of AI tools, their level of utilization, their impact on their performance, and the challenges faced by LIS professionals in the integration of AI tools to contribute to the current understanding of revolutionizing the information retrieval of AI tools to empower the LIS experts of this era. The resources from which the existing literature has been cited are Emerald Insight, JSTOR, and Google Scholar.

Revolutionizing Information Retrieval through AI-based tools

The use of artificial intelligence (AI) is transforming the way we live by influencing our communication, shopping, and research methods. In other words, artificial intelligence is expected to be "essential for everything" (Franke, 2019). Since the initial applications and their ability to help the technological advancement of information-based professions, the usage of AI and robotics in the fields of library and information science has gained interest (Tait & Pierson, 2022). Therefore, our working style is constantly changing due to the advancement of artificial intelligence (AI). AI greatly impacts technological and academic study. The field of academic study is always changing, and artificial intelligence (AI) is having a big impact on how it looks. AI-powered solutions are improving the efficiency and accuracy of the research process at every stage, from locating sources to data

analysis. Research academics and scientists can improve data analysis, expedite learning, and optimize their research methods by utilizing AI tools (Rathinasabapathy, Swetha, & Veeranjaneyulu, 2023).

Similarly, Affum and Dwomoh (2023) examined that artificial intelligence (AI) could affect the library profession. The application of AI technology improves information retrieval, cataloging, user products and services, and technological breakthroughs in the field. Researchers, library professionals, and other partners may make well-informed decisions on integrating AI technologies to fulfill the changing demands of users and enhance library services with a thorough grasp of the possible influence of AI in the library profession. Meanwhile, Hassani and Silva (2023) explored that the talk of the town these days is ChatGPT, an interactive AI platform that makes use of machine learning and speech recognition technologies. The researcher provided a glimpse of ChatGPT's benefits, offered a review of the possibilities as well as the obstacles related to employing it within the domain of data science, and sparked enthusiasm for utilizing it for data science initiatives given the framework's probable effect on the field. ChatGPT may help researchers automate several tasks related to their efficiency of operation, such as filtering and purifying information, developing models, and interpreting results. Moreover, there are various artificial intelligence components, including robotics, processing of natural languages, pattern identification, and expert systems, all of which can be used in colleges and universities in Nigeria. They could be used, for instance, in cataloguing, indexing, categorization, and acquisition of library resources (Idemudia & Makinde, 2022).

Utilization of AI-based Information Retrieval Tools

OpenAI's smart interactive agent, ChatGPT, is a paradigm-shifting development in the domain. ChatGPT has quickly become well-known due to its cutting-edge capabilities, which continue to challenge the limits of what today's avatars are capable of. Its capacity for learning and communication closely resembles human contact, allowing it to blur the line between reliability and synthetic components (Hosseini & Horbach, 2023). Information Professionals understand AI-related technology. The use of NLP-driven assistance, such as Google Assistant, Vocal Browsing, and Google Translator is frequently utilized in library services. Digital and institutional search strategies also employ recognized pattern techniques like textual data extraction. Tools like cloud-based computing, Dropbox, and One Drive, are used for accessing massive amounts of information (Ali, Naeem, & Bhatti, 2020).

Challenges in the integration of AI tools

Artificial intelligence (AI) represents a dynamic innovation that might be applied to public facilities; nevertheless, AI is effectively employed in the functioning of libraries, including a lack of funding, professionals' attitudes, and expertise in the relevant field (Jha, 2023). Similarly, it was found that the expenditures and financing associated with adopting the application of artificial intelligence were important considerations (Kelly, Kaye and Oviedo-Trespalacios, 2022). Several of the obstacles to the adoption of artificial intelligence (AI) apps are related to technical issues (Huang, 2024).

Research Gap

Although artificial intelligence technologies are becoming more and more common in many fields, there is an apparent gap regarding how these applications particularly impact the work of library professionals. Since library professionals have great potential for improving the retrieval and dissemination of knowledge, there is a dearth of research on the implementation and effect of AI tools in libraries. Identifying this gap is essential for determining the most effective ways to integrate AI into library operations, enabling librarians to leverage these tools to improve information search and dissemination for their users.

Research Design and Methodology

This research adopted a quantitative research method to evaluate the use of AI technologies and the difficulties experienced by Library and Information Science (LIS) practitioners (Ghoreyshi & George, 2023). The authors collected data through an online survey questionnaire targeted at LIS professionals who possess Master's, M.Phil, and Ph.D. degree working for public as well as private universities in Lahore Pakistan. In this study, census sampling was used and the population of 214 LIS professionals was included as the sample which did not require the use of a sample selection process. Self-administered structured questionnaires were also used to gather data and these were sent out via email and through a WhatsApp application. The content validity of the questionnaire was reviewed by two experts while reliability analysis indicated that the instrument to be used was valid and reliable. Besides, pilot study was conducted to assess the validity and comprehensiveness of the items included in the questionnaire. Once data was collected, it was analysed using Statistical Package for Social Science software. Data quantification was done using descriptive statistics to establish the level of AI tool usage and the barriers of LIS professionals (Rajan Chattamvelli and Shanmugam, 2023). This approach provided an overall assessment of the state of AI tool use and the challenges that should be addressed in the LIS field, offering some significant insights into the discussion regarding the use of technology in managing libraries.

Delimitations and Limitations

This study will focus on the revolution of AI-based information retrieval and the related challenges faced by LIS professionals working in all the public and private universities in Lahore. Data would be collected only from LIS professionals who are Masters and M.Phil. degree holders working in the university libraries of Lahore. Data would be collected only from the main campuses of the universities. Data would not be gathered from the sub-campus of any universities in Lahore as it will take more time. Library clerks who are master's degree holders but are not working as information professionals would not be included in this research. This study has many limitations. First, the research sample is restricted to library professionals who voluntarily responded to the survey, it could not be entirely typical of all LIS professionals. Furthermore, the survey uses data volunteered by respondents, which may be biased due to societal attraction or recollection issues. Moreover, the research does not investigate certain categories of AI instruments or the environments where they are employed, thereby restricting the applicability of the results. Additionally, the study does not take into consideration the potential effects of time restrictions, holidays, and pandemic scenarios on participant reactions and views. Finally, the study did not evaluate the effects over the long run.

Data Analysis

Demographic Information: The distribution of academic qualifications indicated that 44.8% held a BS or master's degree, 41.7% had an MPhil, and 13.5% possessed a PhD. Regarding designations, 27.1% were Assistant Librarians, 43.8% held the position of Librarian, 19.8% were Senior Librarians, and 9.4% had an unspecified designation. The age groups of the participants varied, with 32.3% falling in the 21-25 range, 4.2% in the 26-30 range, 1.0% in the 31-35 range, 13.5% in the 36-40 range, and 4.2% aged 41 and above. In terms of gender, 52.1% identified as male, while 47.9% identified as female."

Table 1: Demographic Information

		Frequency	Percentage%
Academic Qualification	BS and Master	43	44.8
	MPhil	40	41.7
	PhD	13	13.5
Designation	Assistant Librarian	26	27.1
	Librarian	42	43.8
	Senior Librarian	19	19.8
	Unspecified designation	9	9.4
Age groups	16-20	43	44.8
	21-25	31	32.3
	26-30	4	4.2
	31 -35	1	1.0
	36-40.	13	13.5
	41 and above.	4	4.2
Gender	50	52.1	52.1
	46	47.9	47.9
		96	100

Revolutionizing Information Retrieval through AI-based tools

The survey aimed to determine the effect of AI tools on the information retrieval systems based on self-rendered views of 96 individuals. The findings are presented using descriptives so that the following conclusions can be made based on the results obtained from the current study and the data analysis. On the statement of AI tools empower people to improve information searching the mean score was 3.91 (SD = 0.525) which also showed a very high agreement among the participants. Also, "AI tools enhance dissemination of information by individuals" had a mean of 3.83 SD = 0.536 showing that AI tools aids in enhancing dissemination practises. Specifically, the mean score was established as 3.90 (SD=0.513) regarding the statement 'AI tools allow people to cope with shifts in information search requirements. Moreover, the statement: "AI tools improve the speed and efficiency at which information is found" received a 3.68 (SD=0.657), which signals moderate support for the use of AI for efficiency improvements. Most strongly respondents agreed with the items "AI tools contribute to a more personalised and user-friendly information retrieval experience" and "AI tools revolutionised traditional methods of information retrieval in your library" with average score of 3.85 (SD = 0.542 and SD = 0.481) that indicates the effective role of AI tools in changing the ways of information search in library.

Table 2: Information Retrieval through AI-based tools

Statements	N	Mean	SD
How have AI tools revolutionized the information retrieval system? [AI tools empower LIS professionals to enhance information retrieval]?	96	3.91	.525
How AI-based have tools revolutionized the information retrieval system? [AI tools contribute to improving information dissemination by librarians]?	96	3.83	.536
How have AI-based tools revolutionized the information retrieval system? [AI tools enable LIS professionals to adapt to changing information retrieval needs.]	96	3.90	.513
How have AI tools revolutionized the information retrieval system? [AI tools enhance the speed and	96	3.68	.657

accuracy of information retrieval tasks performed by LIS professionals.]			
How have AI-based tools revolutionized the information retrieval system? [AI tools contribute to a more personalized and user-friendly information retrieval experience for library users.]	96	3.85	.542
How have AI-based tools revolutionized the information retrieval system? [AI tools revolutionized traditional methods of information retrieval in your library.]	96	3.85	.481
Valid N (listwise)	96		

Level of Utilization of AI Tools and its impact on the Performance of LIS Professionals' Workflow

The study aimed to assess the utilization of AI tools by Library and Information Science (LIS) professionals, focusing on their impact on workflow and the challenges of integrating AI into library services. Descriptive statistics were used to analyze the responses of 96 participants. The findings reveal several insights into how AI tools are perceived to enhance library services and professionals' productivity. AI tools were seen as highly beneficial in streamlining library operations, with both "AI tools streamline organizing and finding library materials for easier access" and "AI tools provide aid in finding relevant information for patrons" scoring a mean of 3.81 (SD = 0.604), indicating strong agreement among participants. Similarly, "AI tools assist in effectively managing library resources to meet users' needs" had a mean score of 3.83 (SD = 0.574), further emphasizing the utility of AI in resource management. AI's impact on accuracy and data analysis was also acknowledged, with "The utilization of AI tools has led to more accurate categorization of retrieved data" scoring 3.58 (SD = 0.749), while "AI tools analyze library data to uncover useful patterns and trends for better decision-making" scored 3.68 (SD = 0.703). These results suggest a moderate agreement on AI's ability to improve data organization and decision-making processes. The most notable impact was on productivity, with "AI tools have increased the productivity of your work" scoring the highest mean of 3.90 (SD = 0.552). Participants also reported that AI tools have reduced manual workload (Mean = 3.86, SD = 0.555), enhanced decision-making power (Mean = 3.51, SD = 0.821), and improved time management (Mean = 3.75, SD = 0.681). Furthermore, "AI tools have enhanced the performance of LIS professionals as facilitators of AI-driven services" scored 3.78 (SD = 0.668), underscoring the transformative role of AI in the profession. Overall, the results indicate that AI tools are significantly improving the efficiency, productivity, and decision-making abilities of LIS professionals, while also reducing manual workload and enhancing library services. However, the relatively lower score for decision-making power suggests there may be challenges in fully realizing AI's potential in this area.

Table 3: Level of Utilization of AI Tools and its impact on the Performance of LIS Professionals' Workflow

Statements	N	Mean	SD
What is the level of utilization of AI tools by LIS professionals? [AI tools streamline organizing and finding library materials for easier access.]	96	3.81	.604
What is the level of utilization of AI tools by LIS professionals? [AI tools provide aid in finding relevant information for patrons]	96	3.81	.604

What is the level of utilization of AI tools by LIS professionals? [AI tools assist in effectively managing library resources to meet users' needs.]	96	3.83	.574
What is the level of utilization of AI tools by LIS professionals? [The Utilization of AI tools has led to more accurate categorization of retrieved data]	96	3.58	.749
What is the level of utilization of AI tools by LIS professionals? [AI tools analyze library data to uncover useful patterns and trends for better decision-making.]	96	3.68	.703
What is the impact of AI tools on the performance of LIS professionals' workflow [AI tools have increased the productivity of your work]	96	3.90	.552
What is the impact of AI tools on the performance of LIS professionals' workflow [AI tools have enhanced the power of decision-making]	96	3.51	.821
What is the impact of AI tools on the performance of LIS professionals' workflow [AI tools have reduced the manual workload]	96	3.86	.555
What is the impact of AI tools on the performance of LIS professionals' workflow [AI tools have enhanced the performance of LIS professionals as facilitators of AI-driven services]	96	3.78	.668
What is the impact of AI tools on the performance of LIS professionals' workflow [AI tools have proved helpful in time management]	96	3.75	.681

Challenges in the Integration of AI-Based Tools

The study also establishes the barriers to information literacy LIS professional faced in implementing AI tools for library systems. Concerning the above-mentioned challenges, participants were asked to rate how frequently they faced such challenges on a scale to ensure that the implication of the study is useful in identifying the various barriers that organisations experience while implementing AI. The No. 1 ranked challenge was "difficulties in getting the patrons and the staff

members to use AI services," with the mean score of 3.22 (SD= 0.757), meaning that the challenge of adopting these services is still a major issue of concern. Third, challenges in training staff to use the AI tools were perceived to be average with a mean of 3.16 (SD = 0.812). Other challenges that also elicited moderate response included "Difficulties in implementing AI tools seamlessly with current library systems (Mean=3.01; SD= 0.827) and 'Difficulty in assessing AI tools for sustainability and growth (Mean=3.09; SD= 0.782). These findings underscore the technical and long-term issues of implementing and support AI frameworks in library systems. Two lowest rated challenges were reported as: "Dealing with some ethical issues concerning use of AI in libraries, ranking 2.85, SD = 0.808 and lack of IT knowledge with a mean of 2.98 SD = 0.725, meaning while these are some issues, they are not as prevalent. Likewise, there was moderate agreement in the response given to "Departmental permission for seminars and workshops" (Mean = 2.91, SD = 0.769), which suggests that internal resistance may hamper the overall AI integration. This table again reveals that technical, training, and user adoption issues are recorded more often than ethical issues or IT illiteracy. Bridging these gaps could potentially open the doors for a much more achievable level implementation of AI within libraries.

Table 4: Challenges in the Integration of AI-Based Tools

Statements	N	Mean	SD
What type of challenges are you facing in the integration of AI-based tools [How often do you encounter challenges in making AI tools work smoothly with existing library systems?]	96	3.01	.827
What type of challenges are you facing in the integration of AI-based tools [How often do you find it challenging to train the staff to use AI tools effectively?]	96	3.16	.812
What type of challenges are you facing in the integration of AI tools [How often do you encounter complex ethical concerns related to AI use in libraries?]	96	2.85	.808
What type of challenges are you facing in the integration of AI-based tools [How often do you struggle to ensure that AI tools can be maintained and expanded over time?]	96	3.09	.782
What type of challenges are you facing in the integration of AI-based tools [How often do you find it difficult to get patrons and staff to use AI-powered services?]	96	3.22	.757
What type of challenges are you facing in the integration of AI-based tools	96	3.04	.753

[How often does limited funding create a hindrance to the adoption of AI tools in libraries?]			
What type of challenges are you facing in the integration of AI-based tools [How often do you encounter resistance to change within the library's culture?]	96	2.99	.688
What type of challenges are you facing in the integration of AI-based tools [How often do you find it difficult to measure the effectiveness of AI tools on library services?]	96	3.03	.746
What type of challenges are you facing in the integration of AI-based tools [Lack of IT knowledge]	96	2.98	.725
What type of challenges are you facing in the integration of AI-based tools [Departmental permission for seminars and workshops]	96	2.91	.769
Valid N (listwise)	96		

Results and Discussion

The purpose of this research was to determine the extent of the use of AI tools among LIS professionals, how the tools fit into their workflow, and the difficulties experienced in implementing AI technologies in libraries. Thus, the views and experiences of the participants offer a deeper insight into how current library solutions deliver services based on or employing AI and how the creation process relates to the daily work of LIS professionals. The study also addressed the issues and difficulties encountered in the integration and usage of AI analytical tools. In this study the participants stated that AI tools improve the speed and accuracy of information finding. They were viewed as enablers that assisted the users to make their search and retrieval more efficient, effective, faster and easier while making interaction with a library more personal (Panda & Kaur, 2023). This corroborates other arguments that posited that, through the various AI tools, it is possible to transform conventional modes of obtaining information. Self-organising systems such as search engines and recommendation algorithms have been applauded for the increase in availability and convenience in locating information or materials especially in digital libraries (Meesad & Mingkhwan, 2024). The participants' experience and comments regarding the ability of AI to dynamically present relevant results based on the current information search requirements also corroborates research evidence indicating that AI can enhance search outcomes and help people locate appropriate information. They also indicate that the integration of AI tools in the LIS is beneficial for improving the practitioners' productivity. The respondents said that AI tools help in searching for the relevant literature and resources more effectively, which would benefit professionals in the management of the library resources andmeeting the users' needs. AI was also used in the paper to support the classification of retrieved data and to identify patterns and trends in library data to inform decision-making (Islam & Chang, 2021). In this study, Phayung Meesad and Anirach Mingkhwan (2024) have echoed the use of AI to automate administrative processing, increase efficiency in classification of materials and thus enable informed decision making in library environment. Furthermore, the improvement in

productivity because of integration with AI conforms to findings that suggest that the application of AI is likely to support automating such repetitive tasks delegating significant work to LIS professionals to perform higher-order tasks (Vila, 2024).

The study also established that AI instruments have increased efficiency of LIS professional as service enablers of the AI. This is in line with literature that notes that librarians are assuming more of a role of technology advocates and supporters of digital services. Librarians are no longer only the custodians of physical items but are evolving into digital mediators by developing and promoting AI-driven tools for users (Vijesh, 2024). Through this paper, the role that LIS professionals play in supporting AI-driven services is highlighted as essential in influencing new interactions between users and the various library systems. Although the respondents appreciated the benefits of AI tools for workflow and information retrieval, the study established several difficulties that Libraries have experienced while adopting AI integration. The participants also noted that they are facing some challenges concerning the integration of the AI tools with the current library systems (Maurya and Sinha, 2024). That is not specific to this research; several studies within the literature highlighted that they have encountered similar integration difficulties in libraries that have adopted or are in the process of migrating from traditional systems to AI systems. For example, Okunlaya et al., 2022 discuss that implementation of AI tools in education libraries encounters both compatibility issues with existing systems and the requirement for entirely new hardware and software systems installation.

One of the other issues highlighted by the participants was the challenge of training the employees in the right use of the AI technologies. This is in concordance with research studies that have pointed to the need for training and capacity development of LIS professionals in the context of enabling effective implementation of AI applications (Oluwatosin Daniel Akobe et al., 2025). Since AI technologies are profound, they may not be effectively utilised by some members of staff due to lack of proper training on these technologies and this becomes a source of delay when handling projects that have integrated such technologies. Other challenges mentioned included ethical issues in the use of applications and services based on artificial intelligence: participants noted this as a somewhat less pressing issue. For example, questions like the privacy of information collected, the fairness of some of the AI algorithms, and the openness of AI in decision-making have become areas of controversy in adopting the AI tools across the various organisations including libraries (Hamid Reza Saeidnia, 2023). Concerns such as data privacy, surveillance, bias in the algorithm, and impacts on employment have been noted as some of the ethical concerns in the use of AI that require attention to harness its rightful use in libraries (James Oluwaseyi Hodonu-Wusu, 2024). It also highlighted that the issue of sustaining and growing the investments made in these tools over time remains one of the most difficult cliffs for the LIS professionals. This concurs with the observation of Kulkov et al. (2023) that pay, efficiency, sustainability lies in the frequent changes, improvements, and updates of AI tools to suite the new technological trends. To address these issues, libraries must dedicate resources to maintaining AI tools and to the human beings operating them, to make sure that they work effectively in the long term.

Another problem that emerged from the interviewees' responses was the culture of resistance to change that is predominant in the library. This is in concordance with the literature indicating that culture within organisations hinders the implementation of new technologies. Another challenge that can appear is that there is often a long tradition of manual systems in many libraries, in which case, introducing AI-based tools can be met by staff resistance due to such factors as fear of possible job loss, decreased autonomy, or simply lack of understanding of the potential that AI can offer (Ivchyk, 2024).This study also revealed that participants faced another problem: a lack of adequate funds to support AI implementation. This research finding is evidence of existing literature on the financial impact of implementing AI technology in the library. Challenges may include the question of funds, which can be a prohibitive factor in the implementation of new technology in technologically deprived contexts such as public libraries or small universities (Rahman et al., 2025). The participants revealed that one of the issues they experienced or encountered was the lack of means to evaluate the efficacy of AI tools regarding library services. It is essential, as evaluating the effects of AI tools is important for future enhancements and AL investment justification. According to Adebowale Adewojo et al. (2024) libraries face essential challenges in creating evaluative perspectives that will accurately assess the effectiveness of the AI tools. There is therefore a need to develop sound

assessment criteria that will provide for the optimality and sustenance of AI tools in libraries. Lastly, lack of IT knowledge and getting permission from departments for seminars and workshops were also mentioned as limitations in host study but were not as often. This represents the litany of capacity building in libraries where the introduction of new technologies involves not only the acquisition of new knowledge but also the appropriate support and involvement from the organisations.

Conclusion

The perceived impact of AI-based tools on information retrieval demonstrated positive perceptions among participants. AI tools were acknowledged for empowering individuals, improving information dissemination, enabling adaptation to be changing needs, enhancing speed and accuracy, and providing a more personalized and user-friendly experience. The utilization of AI tools and their impact on workflow further indicated positive sentiments, with high mean scores suggesting a favorable integration into daily tasks and increased productivity. Despite the positive aspects, challenges in the integration of AI-based tools were identified. Challenges included making AI tools work smoothly with existing systems, training staff effectively, addressing ethical concerns, ensuring maintenance and expansion, encouraging user adoption, overcoming funding limitations, managing resistance to change, and measuring the effectiveness of AI tools. These challenges reflect the complex nature of integrating AI into library services.

Recommendations

1. Training and Skill Development: Provide comprehensive training programs to enhance staff skills in effectively utilizing AI tools.
2. Focus on addressing challenges related to IT knowledge and departmental permissions through targeted training initiatives.
3. Ethical Considerations: Establish clear ethical guidelines and protocols for the responsible use of AI in libraries.
4. Provide resources and support for navigating complex ethical concerns related to AI use.
5. User Adoption Strategies: Develop strategies to increase user awareness and encourage patrons and staff to embrace AI-powered services.
6. Address challenges related to resistance to change by fostering a culture of openness and adaptability within the library.
7. Measurement and Evaluation: Implement mechanisms for systematically measuring the effectiveness of AI tools on library services.
8. Develop evaluation criteria and metrics to assess the impact and outcomes of AI integration.
9. Resource Allocation: Advocate for increased funding to overcome limitations hindering the adoption of AI tools in libraries.
10. Explore collaborative opportunities and partnerships to secure additional resources for AI initiatives.
11. Community Engagement: Foster collaboration with the community to understand specific needs and preferences, ensuring AI tools align with user expectations.
12. Continuous Improvement: Establish a feedback mechanism for ongoing assessment and improvement of AI tools based on user experiences and evolving needs.

Implications of the study

The research aims to provide practical guidelines for libraries seeking to integrate AI tools into their information retrieval processes. These guidelines will offer step-by-step recommendations, best practices, and considerations for a seamless and effective adoption of AI in library settings. The findings can guide libraries in selecting and customizing AI solutions that align with their specific needs, ultimately leading to more precise and rapid retrieval of information resources. This research may reveal opportunities for optimizing resource utilization, leading to more informed decision-making regarding staffing, budgeting, and allocation of technological resources.

Librarians may benefit from the research by gaining insights into the evolving landscape of their profession. The study could highlight areas where professional development opportunities related to AI literacy and skills training may be necessary for librarians to adapt to the changing technological landscape. The research contributes to the academic discourse by advancing the understanding of how AI can be practically integrated into library science. The implications extend to the broader academic community, stimulating further research and discussion on the role of AI in information retrieval and library services.

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