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THE ROLE OF ARTIFICIAL INTELLIGENCE IN TRANSFORMING ACADEMIC LIBRARY SERVICES

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ABSTRACT

In the context of the evolving digital landscape, academic libraries are experiencing a significant paradigm shift from their traditional role as repositories of printed materials to multifaceted, interactive information centers that actively support learning, instruction, and scholarly research. A notable advancement in this transformation is the integration of Artificial Intelligence (AI) technologies into library operations. AI-encompassing machine learning, natural language processing, robotics, and data analytics-provides a comprehensive suite of tools capable of enhancing the efficiency, accessibility, and personalization of library services. Given their central role in supporting higher education, academic libraries are increasingly leveraging AI to better address the complex and diverse needs of 21st century students, educators, and researchers. This study aims to examine the empowering role of AI in academic library services through a review of current literature, an analysis of contemporary implementations, and a discussion on prospective developments, culminating in recommendations for key stakeholders.

KEYWORDS: Artificial Intelligence, Emerging Technologies, Academic Libraries, Digital Libraries

INTRODUCTION

The rapid growth of artificial intelligence (AI) is causing substantial changes in a variety of sectors, including academic libraries. Libraries have long been thought of as physical book and journal archives that are essential for research, education, and knowledge exchange. However, libraries are becoming more sophisticated, technology-driven spaces that must change to meet the needs of staff, researchers, and students in the twenty-first century due to the growing complexity of academic demands and the growing reliance on digital resources. A paradigm change that is altering how information is accessible, managed, and shared is represented by the incorporation of AI into library services.

Artificial Intelligence (AI) comprises a broad variety of technologies, including

automation, data analytics, machine learning, and natural language processing, all of which have enormous potential to enhance library operations and services. AI is helping libraries run more smoothly and offer users individualised, on-demand services by improving user search experiences and optimising cataloguing systems. Automating routine tasks frees up library employees to concentrate on more intricate, valuable services, which promotes innovation in fields like user engagement, learning support, and resource discovery.

AI plays an increasingly important role in supporting the provision of excellent, effective, and easily accessible library services as academic libraries continue to embrace digital transformation.

LITERATURE REVIEW

In recent decades, there has been a notable increase in the scholarly discussion surrounding the relationship between AI and library services. The revolutionary potential of AI in improving library operations and user experiences has been emphasised by both scholars and practitioners.

According to Cox, Pinfield, and Rutter (2018), AI has the potential to revolutionize academic libraries by automating routine tasks, improving information retrieval, and supporting personalized learning experiences. Their study emphasizes that while the adoption of AI in libraries is still in its nascent stage, the trajectory points toward widespread implementation in the near future. Cox et.al. examined expert perspectives on the impact of AI in academic libraries, highlighting its potential to transform resource discovery, publishing, and learning. While concerns about ethics, data quality, and job security were noted, libraries are seen as key players in data curation, AI infrastructure, and user support. The concept of the “intelligent library” is proposed to capture these emerging roles and transformations.

Ajani, Y. A. et.al.(2022) explored the awareness and readiness of academic libraries in Nigeria to integrate Artificial Intelligence (AI) into their operations, based on responses from librarians across six geopolitical zones. Using an open-ended questionnaire and thematic analysis, the findings reveal that while Nigerian librarians are aware of AI's global adoption in libraries, its implementation in Nigeria remains limited. Librarians expressed mixed feelings about their institutions' readiness, recognizing AI's potential to improve efficiency but also voicing concerns about job displacement. Key challenges identified include inadequate funding, lack of skilled personnel, unreliable power supply, and insufficient resources for training and system maintenance. The study recommends increased investment in ICT infrastructure and the recruitment of librarians with the necessary technical expertise to support AI integration.

de Leon et.al. (2024) examine the perceptions, challenges, and opportunities related to the integration of Artificial Intelligence (AI) among

Filipino academic librarians. Through a survey of 178 librarians in the National Capital Region of the Philippines, the research assesses their understanding, expectations, and concerns about AI. Their findings indicate that most librarians see AI as a beneficial tool and are open to receiving training for its implementation. The study highlights their readiness to adopt AI, identifies key areas for skill development, and offers insights to guide future AI integration in academic libraries across the Philippines.

Filson, C. K., & Atuase, D. (2024) investigate the role of academic librarians in upholding academic integrity amid the growing use of AI writing tools by students. Using a qualitative, phenomenological approach, interviews with twelve librarians from six Ghanaian universities revealed that librarians primarily focus on promoting research integrity and educating students on the ethical use of information. The study recommends enhancing librarians' skills in AI technologies and revising institutional academic integrity policies to address challenges posed by AI-assisted writing.

Mohamed, S et.al. (2024) investigate the integration of Artificial Intelligence (AI) in Indian libraries, focusing on its impact on efficiency, user experience, and data-driven decision-making. Using a mixed-methods approach involving 300 library staff and patrons, the research found that 70% of the libraries have adopted AI, with most reporting improvements in operational efficiency (80%) and patron services (75%). However, significant concerns were raised regarding data quality (60%), privacy (55%), and ethical issues (50%). The study concludes that while AI offers substantial benefits, these challenges must be addressed to ensure responsible and effective implementation. It recommends future research on long-term impacts and the development of ethical guidelines for AI use in libraries.

Li, L. and Coates, K. (2025) explore the potential of ChatGPT as an AI-powered tool for online reference services in academic libraries, using qualitative content analysis and direct interaction by academic librarians. By comparing ChatGPT's performance with LibChat—a widely used reference chat tool—researchers found that ChatGPT offers 24/7 support and effective general guidance, though its responses

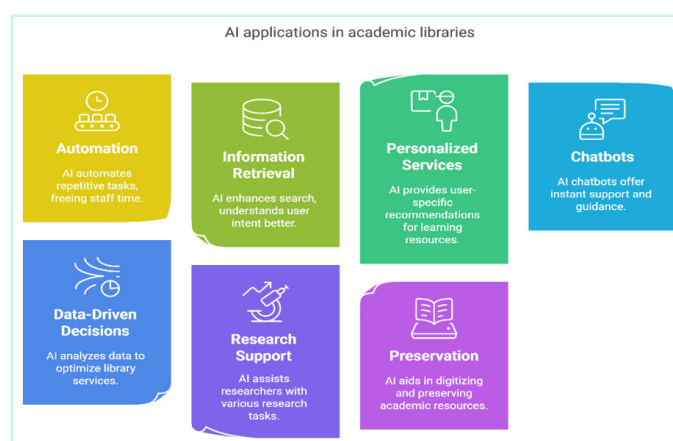
may lack accuracy at times. In contrast, LibChat is limited to librarians' working hours, which restricts continuous access for users. The study highlights ChatGPT's potential to transform library services by meeting the evolving needs of students and faculty. It also notes the current limitations of ChatGPT 3.5 and recommends further research into newer versions and expanded capabilities. This comparative analysis contributes to understanding the role of generative AI in enhancing academic library services and calls for continued innovation and policy development.

Nogueira, L. A.(2025) highlight the growing interest of private companies in developing AI-based tools for research and higher education, presenting both opportunities and challenges for academic libraries. As frequent targets of such technologies, libraries play a crucial role in evaluating these tools on behalf of stakeholders who may lack the time or expertise to do so. The article provides practical guidance for libraries on how to assess AI tools, focusing on three key areas: their purpose, design, and technical features; their impact on information literacy and academic integrity; and broader ethical and political-economic considerations.

Collectively, these studies underscore that while Artificial Intelligence holds immense potential to enhance academic library services - improving efficiency, user engagement, and decision-making - it also presents significant challenges related to ethics, data privacy, staff readiness, and infrastructure. A balanced, strategic approach is essential to harness AI's benefits while addressing its risks, positioning academic libraries as dynamic, intelligent hubs of learning in the digital age.

APPLICATION OF ARTIFICIAL INTELLIGENCE IN ACADEMIC LIBRARIES

AI applications in academic libraries can be categorized into several key domains: automation of routine tasks, enhanced information retrieval, personalized services, and data-driven decision-making.



1. Automation of Routine Tasks The automation of time-consuming and repetitive tasks is one of AI's most obvious advantages for academic libraries. For instance, machine learning algorithms that examine book content and metadata can simplify cataloguing, classification, and indexing. Additionally, AI tools can help with acquisitions, overdue notifications, and inventory management, freeing up library staff time for strategic planning and user engagement.

2. Enhanced Information Retrieval Academic libraries' search features are being improved by AI technology, especially natural language processing (NLP). Intelligent search engines that comprehend user intent and context are replacing conventional keyword-based search systems. The user experience can be enhanced overall by these technologies' ability to deliver more precise and pertinent results. Researchers are also finding hidden patterns and connections in big datasets thanks to AI-based discovery platforms and semantic search tools.

3. Personalized Services Academic libraries may now provide user-specific learning routes and recommendations thanks to AI. Libraries can utilise artificial intelligence (AI) to propose books, articles, databases, and even courses, much like streaming services do based on user behaviour. These recommendations can be based on borrowing history, research interests, and academic goals, promoting more engagement with library resources.

4. AI-Powered Chatbots and Virtual Assistants AI-powered chatbots are being implemented by numerous academic libraries on their digital platforms and websites. These virtual assistants help

customers navigate library resources, offer prompt answers to frequently asked questions, and even help with reference services. Chatbots are available 24 hours a day, seven days a week, and increase the accessibility of library services.

5. Data-Driven Decision-Making AI is capable of analysing vast amounts of user data to find patterns, preferences, and service delivery gaps. Predictive analytics can be used by academic libraries to plan future services, optimise collection development, and forecast resource demand. Libraries can adapt their services to the changing demands of their academic communities by using data-driven insights to better understand user behaviour.

6. AI in Research Support Academic libraries play a crucial role in supporting research, and AI can amplify this support in various ways. Tools powered by AI can assist researchers in literature reviews, plagiarism detection, data visualization, and citation management. Some advanced AI platforms can even generate summaries of research papers and suggest relevant literature based on a given topic or abstract.

7. Preservation and Digitization Artificial intelligence is also helping to preserve knowledge through digitisation projects. Image recognition and optical character recognition (OCR) technologies are used to transform physical archives into searchable digital formats. AI ensures the longevity and accessibility of important academic resources by improving the quality of scanned documents, identifying damaged texts, and even reconstructing missing pieces.

CONCLUSION

Artificial intelligence has the potential to make academic libraries more intelligent, responsive, and user-focused. AI significantly improves the effectiveness and applicability of library services by automating repetitive processes, enhancing information retrieval, providing personalised services, and facilitating data-driven decision-making. Adoption of AI, however, needs to be handled responsibly and cautiously. To make sure AI benefits all users equally, ethical issues like data privacy, algorithmic transparency, and equitable access must be taken into account.

Academic libraries must make investments in infrastructure, train people, and work together with technology vendors if they are to fully utilise AI. In order to adjust to the quickly changing world of AI technology, librarians must likewise adopt an attitude of constant learning and creativity.

In conclusion, artificial intelligence (AI) is a potent instrument that may enhance human librarians' skills and improve the calibre of academic library services, not a substitute for them. AI can enable academic libraries to fulfil the needs of the digital age and carry out their goal of promoting education, research, and lifelong learning if it is implemented carefully and with ethical forethought.

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