

The Role of Artificial Intelligence in Library and Information Science: Innovations, Challenges, and Future Prospects

YUSRI S. ALJAZI

AI HUSSEIN BIN TALAL UNIVERSITY

Yusri.a.jazi@ahu.edu.jo

Abstract

The way libraries handle and make information accessible has changed significantly due to the incorporation of Artificial Intelligence (AI) into Library and Information Science (LIS) services. This article examines how AI technologies affect cataloging, information retrieval, user services, and data analysis, among other LIS-related topics. AI-driven technologies like chatbots, recommendation systems, and natural language processing have improved user experiences by facilitating individualized recommendations and effective information retrieval. Additionally, by automating repetitive operations, AI frees librarians to concentrate on more intricate responsibilities like community participation and research support. Notwithstanding these developments, issues like algorithmic biases and privacy concerns still need to be resolved to guarantee ethical AI use in LIS. This article highlights AI's potential to improve library operations and information access for various user communities by discussing its significant advancements, advantages, difficulties, and future implications in LIS services.

Keywords: Artificial Intelligence, Library and Information Science, Information Retrieval, Digital Preservation, Ethical AI.

DOI: 10.7176/IKM/15-2-09

Publication date: November 30th 2025

Introduction

AI is rapidly and significantly transforming the library and information domain by introducing technically advanced solutions for efficient information management, improved user experiences, and effective running of any library or information center (Mupaikwa, 2025). AI emulates human intelligence to process information, learn, reason, make informed decisions, and understand the natural language. Libraries are employing AI technologies to address some of the traditional problems that were created and, at the same time, utilize the same to extend more personalized, efficient, and supportive services to their clientele. In a time of rapid digital evolution, AI's trajectory perfectly coincides with the accelerated transformation of how information is delivered, accessed, and managed in libraries.

AI Applications in LIS

One central area where AI makes a difference in LIS is information retrieval. AI-powered search engines use machine learning algorithms to improve the accuracy and relevance of search results. Such systems can identify user intent, recognize patterns in search behavior, and continuously adjust to precise and personalized experiences for information retrieval (Bawden & Robinson, 2012). By enabling artificial intelligence searching, this version can guarantee that users get more relevant and contextual information, improving the effectiveness and efficiency of research and seeking information (Almaghrabi & Chetty, 2020).

It is also changing the face of cataloging and metadata management by taking over processes that would have required the involvement of a vast human workforce. AI-driven systems will automatically provide metadata tags, classifications, and keywords for digital resources, thus ensuring that metadata standards will be implemented consistently. However, perhaps more importantly, they will reduce human labor in the cataloging process significantly and effectively (Jothimani et al., 2024). This will also effectively streamline the visibility process among users, enabling them to reach their needed materials and leveraging AI to maintain high-quality bibliographic records and optimal resource management (Vidhate et al., 2019).

It has also brightened support services in the library via chatbots and virtual assistants, coupled with improved user engagement. They answer reference questions, help readers with circulation services, and recommend appropriate reading based on the user's search history and preferences. This feature allows the virtual assistant to emulate humans in interactions due to the use of machine learning and natural language processing, which will enhance the responsiveness and availability of the services offered by the library. Advancements in technology have allowed libraries to extend their hours to hours when regular businesses are closed, giving people continuous access to information and support (Kumar & Jyoti, 2024).

Overall, better IS/LIS user support, faster catalog and metadata management, and enhanced information retrieval can often be cited as how AI has revolutionized LIS (Litsey & Mauldin, 2018). To develop more efficient and user-friendly library services and thereby influence information management in the digital age, it is expected that the further development of AI technologies will find its integration into LIS.

AI technologies are required to assess user data to understand user behavior and preferences. The improvements that libraries may bear for user happiness hold grounds based on the same, i.e., using data to recommend relevant resources, service personalization, etc. With AI-based reading analytics, libraries can take charge of promoting sustained patronage as well as facilitating a very personalized information-gathering experience. Such developments by libraries towards more dynamic and flexible services will shift the balance of the information access scenario further toward the user.

AI improves user experiences and automates mundane tasks in libraries. Automation driven by AI could also fast-track repetitive assignments related to collection maintenance, interlibrary loans, and inventory management. The human workforce at the library can utilize its time better if the manual burden of such operational duties is lightened. It will then be possible to free up the staff for increasingly strategic activities—backing research, promoting digital literacy, and working with users (Huang et al., 2023). This increment raises the quality of services offered by libraries and increases their operation's efficiency.

AI also plays a supporting role in digital preservation efforts to maintain the authenticity and perpetual access to digital materials. AI makes keeping academic and historical documents easy by automating tasks of restoring content and carrying out optical character recognition (OCR) and content identification (Schellnack-Kelly & Modiba, 2024). By protecting invaluable digital artifacts from deterioration over time, this technology increases their accessibility for researchers and future generations. Integrating AI into digital preservation initiatives can simplify the procedures required to preserve digital repositories, thereby increasing the sustainability of scientific and cultural assets.

AI in libraries has many benefits, including strategic decision-making, improved user experience, and operational efficiency. AI improves library efficiency by simplifying processes, reducing manual labor, and optimizing resource allocation. By automating repetitive tasks and improving search capabilities, AI reduces administrative burdens and frees up librarians' time for meaningful human interactions. Furthermore, AI enhances the personalized user experience by making information searches more relevant and easier, providing immediate assistance, and personalized recommendations (Mascari et al., 2024).

AI-powered data analytics provides valuable insights into user needs and behavior that can also be useful for libraries. By studying trends in user interactions, AI can help libraries make informed decisions about resource acquisition, service improvements, and collection development. This data-driven approach ensures that library services are relevant and adaptable to changing customer needs (Zhang & Zhang, 2023). Furthermore, AI drives innovation in library and information science by facilitating the adoption of new technologies and enabling libraries to adapt to the changing information environment (Aliwy et al., 2021).

AI-Powered Information Retrieval

Artificial intelligence (AI)-based information retrieval systems are transforming the efficiency, relevance, and accessibility of research methods in library and information science (LIS). These advanced systems use AI techniques to interpret users' search queries in a broader context, considering user preferences, search history, and intent variables. By leveraging contextual information and considering the unique needs of each user, AI engines can deliver more accurate and personalized search results. This feature ensures that users receive relevant recommendations and information that complement their search habits and information-seeking behavior (Manning et al., 2008). The addition of semantic search allows search engines to understand the meaning and relationships between words rather than simply matching keywords, which is a significant advance in AI search. AI improves search accuracy by identifying synonyms, related terms, and contextual meaning, enabling users to return comprehensive and meaningful results. This enhancement is particularly useful in

academic and research environments where experts must interpret complex queries before accessing relevant resources. Furthermore, AI continuously improves relevance rankings by studying user interactions and comments, ensuring that the most reliable and valuable sources appear first in search results (Baeza-Yates & Ribeiro-Neto, 2011).

Information seeking can now be more predictive thanks to AI systems' ability to infer user intent from external cues and historical data. With this predictive capability, libraries can provide proactive support by providing relevant resources before users request them. Artificial intelligence uses this predictive power to simplify information retrieval and reduce the number of search queries, transforming the search process from a passive process to an intuitive and fluid interaction (Jansen et al., 2008).

These advances in information retrieval are based on various AI techniques, such as deep learning, natural language processing (NLP), and machine learning models. Supervised and unsupervised machine learning can improve the classification and categorization of information, thereby increasing the accuracy of search engine optimization and recommendation systems. Search engines can process natural language queries using natural language processing (NLP), which underpins voice search operations and conversational interfaces. Deep learning, primarily through neural networks, has further expanded the scope of AI systems by simplifying complex tasks such as image analysis and processing of unstructured data (Goodfellow et al., 2016).

AI-powered information discovery through voice search, visual search, and personalized recommendations has significantly improved the user experience in practical applications. AI can make learning more engaging and effective by recommending books, articles, and other resources based on user behavior and preferences. Voice search integration is a simple and convenient way to find information, allowing users to interact with the library system in natural language. In addition, visual search tools improve accessibility to non-text content by allowing users to upload images to search for related items in library collections (Russell, 2019).

The benefits of AI-powered information discovery are not limited to increased search accuracy but include increased efficiency in resource discovery. AI reduces the time users spend searching for large amounts of information, reduces information overload, improves search accuracy, and ultimately increases search efficiency. Over time, information retrieval methods will become more responsive and flexible to user needs due to the ability of AI systems to learn continuously (Croft et al., 2011).

AI is also important for digital preservation because it solves the problem of preserving digital content and ensuring its long-term accessibility. Since digital preservation involves methods and tools to protect digital assets such as documents, multimedia files, databases, and software, it is of great importance to libraries, information systems, and cultural heritage institutions. Artificial intelligence (AI) supports these initiatives by automating content analysis, optical character recognition (OCR), and content search. By preventing obsolescence and digital degradation, this technology helps ensure that invaluable content remains accessible to future generations. By integrating artificial intelligence into digital information discovery and preservation processes, libraries and archives can fulfill their responsibilities regarding information dissemination while adapting to the changing demands of the digital age (Conway, 2010).

AI in Digital Preservation

The advent of artificial intelligence (AI) has revolutionized digital preservation, enabling libraries and other cultural heritage institutions to manage, protect, and ensure long-term access to digital materials. The sheer volume of digital assets and threats from legacy formats, data corruption, and technological change require advanced preservation technologies. Machine learning and computer vision are two examples of AI technologies that help identify and classify digital documents based on format, type, and metadata. AI enables efficient organization and retrieval by automatically classifying and tagging digital assets, allowing organizations to maintain organized and accessible digital repositories (Yackel & Torres, 2003). OCR technology converts scanned documents and photographs into machine-readable text and is one of the most important AI technologies in digital preservation. This technology enables full-text search, which significantly increases the usability of digital resources. AI-powered OCR technology ensures that scientific and historical text is preserved in a searchable and usable format over time, improving the speed and accuracy of text analysis. As AI advances, OCR applications become more sophisticated and can more accurately handle handwritten text, complex scripts, and damaged documents (Duranti, 2016).

AI improves data quality management by verifying and assessing the integrity of digital data sets rather than identifying and modifying content. AI systems can detect errors, inconsistencies, or signs of corruption, thereby ensuring the authenticity and reliability of digital resources. In addition, AI content recognition technology

provides valuable assistance in preserving historical audio, video, and graphic information. Cultural heritage institutions can display objects in improved condition without sacrificing their historical significance thanks to restoration algorithms that recover damaged or distorted information while preserving its authenticity.

AI also helps enrich metadata by automatically extracting and generating descriptive metadata from digital objects. This capability makes it easier for researchers, scholars, and the public to find and understand digital content, improving document discovery and contextual understanding. In addition to improving the search and retrieval capabilities of digital documents, the development of AI metadata has also reduced the tedious process of manual metadata creation, thereby ensuring accuracy and consistency (Fan, 2018).

AI's predictive capabilities can also assist in risk assessment and prevention planning. AI models can identify potential risks to digital assets, including degraded data quality, hardware or software dependencies, and outdated formats. AI helps organizations take a proactive approach to data preservation by predicting vulnerabilities and mitigating risks before they lead to data loss or unavailability (van der Hoeven et al., 2005). This proactive approach ensures that digital collections remain viable and accessible despite technological advances.

Increased flexibility, efficiency, and ease of use are benefits of using AI to store digital data. By automating labor-intensive tasks, AI enables organizations to manage large volumes of digital content without relying on excessive human resources. Future generations can access and use stored content with enhanced viewing, searching, and retrieval capabilities (Duranti, 2016). The integrity of digital assets is further enhanced by maintaining high standards of accuracy and reliability through AI-powered quality assurance processes. However, most importantly, AI can help forward-thinking institutions mitigate the risks associated with technological change and ensure the long-term viability of digital collections.

The use of AI for digital preservation has many advantages and disadvantages that need to be properly assessed. Data privacy, algorithmic bias, and digital asset ownership are ethical issues that need to be carefully monitored and addressed. Furthermore, preserving the logic and insights behind AI decisions underscores the need for openness and human participation in decision-making. If institutions hope to implement AI in digital preservation processes successfully, they must invest in AI infrastructure, train staff, and develop guidelines for the proper use of AI.

Artificial intelligence (AI) has enormous potential to transform digital preservation by streamlining processes, improving content quality, and facilitating proactive risk management. Libraries and other cultural institutions can protect their digital collections and ensure long-term accessibility by applying AI methods to the preservation process (Fan, 2018). However, as AI evolves, institutions must also address the ethical and practical issues surrounding its use and ensure that these tools are used wisely to preserve knowledge and cultural heritage for future generations.

Challenges and Future Outlook of AI in LIS Services

Artificial intelligence (AI) has the potential to revolutionize library and information services by introducing new approaches to information management, user interaction, and increased efficiency. As AI increasingly integrates into library systems, libraries will benefit from enhanced search capabilities, personalized services, and automated processes. However, the implementation of AI is not without challenges. These issues need to be addressed to ensure that the benefits of AI in libraries and information systems are appropriately utilized and cost-effective. Furthermore, research on the potential of AI in libraries and information technology has identified new developments and trends that will impact the next wave of library services (Hodonu-Wusu, 2024). Issues related to bias and data quality are the main barriers to implementing AI in libraries and information technology. Since AI models rely primarily on training data, biased data can affect the system's output and generate unfair or misleading information. High-quality, diverse, and representative datasets are essential to ensure the reliability and fairness of AI-powered library services. Ethical and privacy issues complicate AI adoption, as libraries must address concerns about algorithmic vulnerabilities, user data protection, and the ethical implications of automated decision-making. Libraries must prioritize responsible AI to maintain user trust and ensure secure and open data governance (Tijani et al., 2024).

Another major obstacle is the lack of AI capabilities. Effective implementation of AI systems in libraries requires data science, machine learning, and AI development expertise. Libraries' inability to hire and train staff with the necessary technical skills can hinder the widespread use of AI. Furthermore, the capital costs of implementing AI (e.g., costs associated with software, infrastructure, and ongoing training) can be prohibitive for libraries with limited budgets. Funding for AI projects can be difficult, especially for small businesses, which can limit their

ability to use the technology effectively (Shatri et al., 2024). Another issue with choosing AI is its transparency. Because many AI models operate as complex black-box systems, their output can be challenging to understand. The lack of transparency raises concerns about trust and accountability, significantly when AI impacts critical decision-making processes. To address this issue, libraries must make human oversight an integral part of AI applications. This allows for responsible monitoring, interpretation, and intervention when necessary (Steyvers & Kumar, 2023).

Despite these obstacles, the future of AI in library information systems looks bright, with many exciting developments that will continue to impact library operations and customer interactions. One of the most revolutionary features of AI is its ability to provide highly personalized services. To improve the user experience, AI systems can learn from users' behavior and preferences and provide personalized recommendations, adaptive learning, and contextual assistance. As AI advances, libraries can offer more intuitive and user-friendly services, helping people access information more quickly and efficiently (Almaghrabi & Chetty, 2020). The future of AI in library information systems also relies heavily on collaboration. To support resource sharing, large-scale data analysis, and collaborative projects, libraries can increasingly collaborate to create shared AI platforms and tools (Ahmed et al., 2024). By working together, institutions can maximize the potential of AI and create a culture of innovation and knowledge sharing. Furthermore, AI technologies are further improving access to information through natural language processing, semantic analysis, and more advanced search algorithms, making it easier for users to find and interact with relevant resources.

Another area with significant growth potential is the integration of AI with advanced technologies such as blockchain, augmented reality, and virtual reality. These advances create new opportunities for secure digital data storage, interactive learning, and information sharing. AI assistants and chatbots are likely to continue to evolve, providing more natural and interactive interactions and intuitively bridging the gap between users and digital resources (Soliman et al., 2024).

As AI becomes increasingly integrated into library information services, the ethical governance of AI will become an important issue. Libraries should develop clear guidelines emphasizing accountability, transparency, and fairness in implementing AI. To ensure AI's ethical and sustainable use, bias, data privacy, and algorithmic decision-making must be addressed. Institutions should strive to develop policies that protect user rights and privacy while promoting equitable and inclusive access to AI services (Zaidan & Ibrahim, 2024). Ongoing research and innovation are also essential for the further development of AI in library and information services. At the forefront of the development of AI in libraries are initiatives that reduce bias, increase AI transparency, and improve user-centered design (Kalisdha, 2024). AI continues to evolve as researchers and practitioners explore new uses and enhance existing technologies to improve library services, streamline operations, and create more meaningful user experiences.

While many barriers exist to integrating AI into library information systems (LIS), the prospects are no less promising. Libraries can use AI to revolutionize their services and meet the changing needs of their customers by addressing ethical issues, investing in talent development, and facilitating collaboration. AI can strengthen libraries' position as essential centers of learning, information, and digital access for future generations when appropriately implemented and developed over time. While many barriers exist to integrating AI into LIS, the prospects are no less promising. Libraries can use AI to revolutionize their services and meet the changing needs of their customers by addressing ethical issues, investing in talent development, and facilitating collaboration. AI can strengthen libraries' position as essential centers of learning, information, and digital access for future generations when appropriately implemented and developed over time.

Conclusion

As artificial intelligence (AI) is introduced into library and information science (LIS), the way libraries process information, interact with users, and streamline their operations is evolving. AI solutions can simplify digital cataloging, automate repetitive tasks, personalize the user experience, and improve information retrieval. Libraries can use AI to provide more efficient, user-centered, and accessible services and to keep resources organized, secure, and accessible to a diverse audience. AI in library information science has the potential to revolutionize the field, but several hurdles must be overcome before it can be used responsibly and successfully. Issues such as algorithms, privacy, openness, and data quality need to be carefully considered. Other barriers to using AI in libraries include a lack of expertise, budget constraints, and the need for human oversight. To maximize the benefits of AI and mitigate its risks, these issues must be addressed through ethical AI governance, investment in staff training, and cross-institutional collaboration.

In the future, AI will drive innovation in library information systems, enabling libraries to create collaborative AI platforms, provide highly personalized services, and interact with advanced technologies such as blockchain and augmented reality (AR). As research into AI in library information systems continues, ongoing initiatives to increase transparency, reduce bias, and ensure equitable access to AI resources will remain critical to the development of library services.

Although there are still some hurdles to overcome, the future of AI in library information systems looks promising. If libraries use AI wisely, ethically, and with human oversight, they have the potential to enhance their role as information hubs in the digital age. Innovative and intelligent use of artificial intelligence can make library information systems more dynamic, adaptable, and user-centric, ensuring long-term sustainability and access to information for future generations.

Declaration statement: This manuscript includes content generated with the assistance of generative artificial intelligence (AI). ChatGPT was used for language refinement and summarization of the text. The authors reviewed, edited, and take full responsibility for the final content of the manuscript in accordance with the journal's guidelines.

References

- Ahmed, R., Rafiq, M., & Ammar, A. (2024). The role of artificial intelligence in transforming public libraries: Enhancing user experience and operational efficiency. *International Journal of Multidisciplinary Education and Research*, 9(4), 24–33.
- Aliwy, A., Abbas, A., & Alkhayyat, A. (2021). NERWS: Towards Improving Information Retrieval of Digital Library Management System Using Named Entity Recognition and Word Sense. *Big Data and Cognitive Computing*, 5(4), 59. <https://doi.org/10.3390/bdcc5040059>
- Almaghrabi, M., & Chetty, G. (December 16, 2020). Deep Machine Learning Digital library recommendation system based on Metadata for Arabic and English Languages. *2020 IEEE Asia-Pacific Conference on Computer Science and Data Engineering (CSDE)*. <https://doi.org/10.1109/csde50874.2020.9411525>
- Asim, M., Arif, M., Rafiq, M., & Ahmad, R. (2023). Investigating applications of Artificial Intelligence in university libraries of Pakistan: An empirical study. *The Journal of Academic Librarianship*, 49(6), 102803. <https://doi.org/10.1016/j.acalib.2023.102803>
- Baeza-Yates, R., & Ribeiro-Neto, B. (2011). *Modern information retrieval: the concepts and technology behind search*. Addison Wesley.
- Bawden, D., & Robinson, L. (2012). *Introduction to information science*. Facet.
- Conway, P. (2010). Preservation in the Age of Google: Digitization, Digital Preservation, and Dilemmas. *The Library Quarterly*, 80(1), 61–79. <https://doi.org/10.1086/648463>
- Croft, B., Metzler, D., & Strohman, T. (2011). *Search Engines*. Pearson Higher Ed.
- Duranti, L. (2016). *The InterPARES 2 project (2002-2007)*.
- Fan, G. (2018). *Making Better out of Technologies: Responses of Inter pares to Digital Records Management Challenges*. Scitepress.org. <https://www.scitepress.org/Papers/2018/72308/pdf/index.html>
- Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning*. The MIT Press. <https://www.deeplearningbook.org/>
- Hodonu-Wusu, J. O. (2024). The rise of artificial intelligence in libraries: the ethical and equitable methodologies, and prospects for empowering library users. *AI and Ethics*. <https://doi.org/10.1007/s43681-024-00432-7>
- Huang, Y., Cox, A. M., & Cox, J. (2023). Artificial Intelligence in academic library strategy in the United Kingdom and the Mainland of China. *The Journal of Academic Librarianship*, 49(6), 102772. <https://doi.org/10.1016/j.acalib.2023.102772>
- Jansen, B. J., Booth, D. L., & Spink, A. (2008). Determining the informational, navigational, and transactional intent of Web queries. *Information Processing & Management*, 44(3), 1251–1266. <https://doi.org/10.1016/j.ipm.2007.07.015>

- Jothimani, B., Anandraj, K., & Aravind, S. (2024). Artificial Intelligence in Collection Development and Management in Libraries: a Research Overview. *Artificial Intelligence & Green Revolution: Transforming Library Management for Sustainable Future, 1*.
- Kalisdha, A. (2024). The Impact of Artificial Intelligence and Machine Learning in Library and Information Science. *International Journal of Research in Library Science*, 10(1), 39–58. <https://doi.org/10.26761/ijrls.10.1.2024.1733>
- Kumar, P., & Jyoti, N. (2024). Reshaping the library landscape: Exploring the integration of artificial intelligence in libraries. *IP Indian Journal of Library Science and Information Technology*, 9(1), 29–36. <https://doi.org/10.18231/j.ijlsit.2024.005>
- Litsey, R., & Mauldin, W. (2018). Knowing What the Patron Wants: Using Predictive Analytics to Transform Library Decision Making. *The Journal of Academic Librarianship*, 44(1), 140–144. <https://doi.org/10.1016/j.acalib.2017.09.004>
- Manning, C. D., Raghavan, P., & Schütze, H. (2008). *Introduction to Information Retrieval*. Cambridge University Press.
- Masciari, E., Umair, A., & Ullah, M. H. (2024). A Systematic Literature Review on AI-Based Recommendation Systems and Their Ethical Considerations. *IEEE Access*, 12, 121223–121241. <https://doi.org/10.1109/access.2024.3451054>
- Mupaikwa, E. (2024). The Application of Artificial Intelligence for Reference Purposes in Academic Libraries. *Advances in Library and Information Science*, 166–192. <https://doi.org/10.4018/979-8-3693-1573-6.ch007>
- Russell, S. J. (2019). *Human compatible : artificial intelligence and the problem of control*. Viking.
- Schellnack-Kelly, I., & Modiba, M. (2024). Developing smart archives in society 5.0: Leveraging artificial intelligence for managing audiovisual archives in Africa. *Information Development*. <https://doi.org/10.1177/02666669241286224>
- Shatri, E., Raymond, D., & Fazekas, G. (2024). *Low-Data Classification of Historical Music Manuscripts: A Few-Shot Learning Approach*. ArXiv.org. <https://arxiv.org/abs/2411.16408>
- Soliman, M. M., Ahmed, E., Darwish, A., & Hassanien, A. E. (2024). Artificial intelligence powered Metaverse: analysis, challenges and future perspectives. *Artificial Intelligence Review*, 57(2). <https://doi.org/10.1007/s10462-023-10641-x>
- Steyvers, M., & Kumar, A. (2023). Three Challenges for AI-Assisted Decision-Making. *Perspectives on Psychological Science*, 19(5). <https://doi.org/10.1177/17456916231181102>
- Tawalbeh, A. K. (2024). The Role of AI in Improving Digital Archiving in University Libraries. *Journal of System and Management Sciences*, 14(6). <https://doi.org/10.33168/jsms.2024.0628>
- Teel, Z. A. (2024). Artificial Intelligence’s Role in Digitally Preserving Historic Archives. *Preservation, Digital Technology & Culture*, 53(1), 29–33. <https://doi.org/10.1515/pdte-2023-0050>
- Tijani, L. T., Kingsley-Omoyibo, A. Q. S., Nkapia, S. S., Frieda, L. N. H., Esievo, L. O., Obande, B. O., & Ado, M. B. (2024). Artificial Intelligence in Academic Libraries and Its Impact on Library Services and Operation. *Omanarp International Journal of Library and Information Science*, 1, 53–61.
- van der Hoeven, J. R., van Diessen, R. J., & van der Meer, K. (2005). Development of a Universal Virtual Computer (UVC) for long-term preservation of digital objects. *Journal of Information Science*, 31(3), 196–208. <https://doi.org/10.1177/0165551505052347>
- Vidhate, P. S., Badgujar, A., Patil, N., & Pawar, R. (2019). A Review on Library Automation Using Artificial Intelligence A Review on Library Automation Using Artificial Intelligence. *SSRN Electronic Journal*, 6(1), 301–303.
- Yakel, E., & Torres, D. A. (2003). AI: Archival Intelligence and User Expertise. *The American Archivist*, 66(1), 51–78. JSTOR. <https://doi.org/10.2307/40294217>

- Zaidan, E., & Ibrahim, I. A. (2024). AI Governance in a Complex and Rapidly Changing Regulatory Landscape: A Global Perspective. *Humanities and Social Sciences Communications*, 11(1), 1–18. <https://doi.org/10.1057/s41599-024-03560-x>
- Zhang, X., & Zhang, J. (2023). Analysis and research on library user behavior based on apriori algorithm. *Measurement: Sensors*, 27, 100802. <https://doi.org/10.1016/j.measen.2023.100802>