International Journal of Research in Library Science (IJRLS)

ISSN: 2455-104X

DOI: 10.26761/IJRLS.11.2.2025.1909

Volume 11, Issue 2 (April-June) 2025, Page: 319-323, Paper ID: IJRLS-1909

The Future of Libraries with Artificial Intelligence

Dr. Konduru Jamuna

Librarian, Government First Grade College, Devanahalli, Bengaluru Rural, Karnataka, India

jamunakraju@gmail.com

ABSTRACT

Over the last few decades, libraries around the world have evolved from being a physical repository of books to dynamic, digital hubs of learning and information. The rise in the use of computers, the internet, and the upcoming and most recent advancement, Artificial Intelligence (AI), has significantly transformed how libraries operate. This paper explores how AI technologies across the world are reshaping the experience in libraries by automating tasks, enhancing the user experience, personalising learning, creative interactive experience and preserving historical data. Through a few global examples of how AI is used in libraries, this paper highlights current innovations in this space, talks about future potential, while also addressing ethical concerns to create an inclusive, knowledge-filled learning space for communities.

.

KEYWORDS: Artificial Intelligence, Libraries, Technology, Personalised Learning.

INTRODUCTION

Libraries have undergone significant transformations over the past few decades. What started as a physical space filled with books has been transformed tremendously. It all began with the rise of computers and then the internet, which allowed common people like you and me to access information at the tip of our fingers. Moreover, the digitization of books, magazines, news and other informational resources made it all the easier. This shift turned libraries from a mere repository of books into digital hubs of information & learning.

The Advent of Artificial Intelligence

In recent years, artificial intelligence has taken the world by storm. Nearly every other sector is leveraging AI and libraries are not far from it either. AI is enabling libraries to be smarter and more efficient. These AI-powered algorithms help libraries in filtering large amounts of data within a fraction of a second, making search results more and more accurate. With AI, we can also analyse user behaviours and patterns, which leads to providing recommendations tailored to their interests, which ultimately enriches a reader's experience.

How can we truly leverage AI in libraries?

AI has multiple applications in libraries including automating book classification, improving discovery of books and search functionality, offering translations, explanations, summaries, and chatbot assistance to name a few. It makes the libraries more accessible, efficient and reader-friendly.

Here are some of the ways in which AI can benefit libraries:

1. Automation and Optimizing Library Efficiency

AI can help streamline library tasks and operations by automating manual and repetitive tasks such as cataloguing, shelf-reading, inventory management, etc. This allows librarians to focus more on meaningful and engaging work. For instance, AI powered library management systems can handle check-in and check-out of books using Radio-Frequency Identification (RFID), facial recognition or Student ID code scanning, making the whole process a lot faster, accurate and efficient.

2. Enhanced Reader Experience

AI can help in making libraries and information more accessible to people of different backgrounds, language and abilities. With the help of text-to-speech, language translation, voice searches, and virtual chatbots, AI can ensure that all users can utilize library resources.

3. Personalised Learning

AI can analyze reading patterns, trends and search history of a reader to tailor recommendations that will fit their unique needs. Just like how movie streaming services like Netflix increase user engagement by providing movie recommendations based on their previous watch history, AI can recommend books and information similarly, increasing reader's engagement.

4. Preservation & Retrieval of Historical Information

AI plays a key role in enabling digital archiving of historical documents, rare books and fragile documents. Machine learning algorithms help in analyzing, restoring and interpreting any missing information in these documents ensuring that the future generations have access to historical pieces of documents.

5. Gamifying and Creating an Interactive Experience

AI can enable creation of fun, interactive quizzes based on the books that users are reading, to reinforce learning and make it a more engaging experience. It can also help in creating an immersive experience by providing AI generated images, videos and virtual tours, that make learning more interesting.

There are a few noteworthy examples of AI implementations in libraries across the world such as:

1. Automated Subject Indexing – Annif at the Finnish National Library

The Finnish National Library uses an AI powered tool called Annif, to automate subject indexing and classification. It eliminates repetitive manual cataloguing and allows librarians to dedicate more time to strategic work and reader engagement.

How To Use ANNIF
Choose subject vocabulary
Prepare a corpus from training data
Load the vocabulary and train the model
Suggest subjects for new documents

2. AI-Powered Virtual Assistants – Oodi Library, Helsinki

The Oodi Library in Helsinki has introduced AI-driven virtual assistants that enable readers to find resources, navigate the library, perform language translations and get instant virtual support. These virtual assistants improve accessibility and ensure that users receive the help that they need in real-time.

3. AI-Driven Search Engines – Iris.AI and Yewno

For readers, traditional keyword-based searches can be frustrating which is why AI-powered search engines like Iris. AI and Yewno use natural language processing (NLP) to make searches more intuitive. This enables users to enter queries in natural, conversational language and receive more relevant and contextualized results.

4. AI in Institutional Repositories – Hamlet (Hierarchical Agent-based Machine Learning Platform)

Managing academic research and thesis collections is a huge and a complex task. Hamlet system automates metadata extraction and indexing, making research work more discoverable. It also ensures that scholarly content is well-organized and easily accessible to those who need it.

5. AI-Based Logistics – Helsinki City Library

It is difficult to keep track of thousands of books and materials, and order new books on time without smart inventory and logistics. The Helsinki City Library has implemented an AI-driven material management system that predicts demand and optimizes inventory levels, ensuring that resources are always available where and when they're needed.

6. AI for Community Engagement – Toronto Public Library's AI Awareness Programs

Librarians and people working in the educational industry across the world need to keep themselves updated with newer technologies and their proper usage. Toronto Public Library has proposed AI awareness programs, and policies including webinars and workshops, to educate their staff and public about artificial intelligence, its applications, and ethical considerations.

THE FUTURE OF AI IN LIBRARIES

With AI and its applications advancing rapidly, libraries are set to become smarter, more automated and intuitive. By integrating AI with other emerging technologies like Internet of Things (IoT), Augmented Reality (AR), and Virtual Reality (VR), libraries can create unique immersive and interactive experiences for users. In the future, we could see various other applications of AI in the form of virtual librarians, AI powered educational tools and advanced data analytics that can help libraries understand user needs in a better way and curate their collections accordingly.

Some of the examples of what the future holds for AI in libraries are as follows:

1. Virtual and Augmented Reality for Learning

Imagine stepping into a library and experiencing Augmented Reality (AR) to explore and learn more about the history and its artefacts, or imagine walking through a Virtual Reality (VR) simulation of a famous scene from English literature and drama. Such personalized experiences, and visual indulgence keeps the user intrigued and engaged to learn and explore more. An author's narrative style, and the true meaning of their writing can be captured beautifully through this technology.

2. Predictive Analytics for Smarter Collections

AI-driven analytics can assist libraries in anticipating and predicting what kind of books the users might be interested in, before they can even ask for it. It has the potential to analyze each user's book borrowing trends and preferences, which becomes a pattern for the AI to predict and prepare the library with the right materials. This ensures that the collections always remain relevant and diverse to different user's needs.

3. AI-Powered Virtual Librarians

In the future, libraries can have virtual librarians available 24/7, who are capable of answering questions, assisting with locating books, recommending books, helping in research and guiding them through various other resources. These intelligent virtual assistants make library services accessible at anytime and anywhere, bridging the gap of the physical absence of librarians 24/7.

CHALLENGES AND ETHICAL CONSIDERATIONS

While AI brings promising opportunities for libraries and librarians, it also comes with its own challenges. Privacy concerns, biases of algorithms, and the risk of losing the human-touch in library services are a few of the issues that need to be dealt with. We must also ensure that we use AI responsibly, while ensuring inclusivity and accessibility are always at the forefront. We need to enable a balance between the traditional role of librarians and leverage AI and other newer technologies in order to maintain the true essence of a library as a community driven space for knowledge and learning.

CONCLUSION

The integration of AI marks a new era in the evolution of libraries, transforming them into more vibrant, Inclusive and immersive spaces for learning. By embracing it and acknowledging the responsibilities we need to carry while using it, we can leverage AI to transform libraries ethically and enhance efficiency, accessibility and the overall user experience for future generations.

REFERENCES

[1] Barsha, Munshi, Duggal, Green, B. P., Panda, Chakravarty, New York Public Library, Subaveerapandiyan, Gürsen, & Ogwo. (2023). Artificial intelligence-enabled virtual assistants: a systematic review on redefining user engagement in libraries. In *AI In Libraries* [Journal-article]. https://conferences.klisc.or.ke/event/5/contributions/27/attachments/11/16/%5BPresentation%5D%20KIC2024%20-%20Rutere.pdf

[2] *Iris.ai RSpaceTM - AI powered search engine for your researcher workspace*. (n.d.). Iris.ai. https://iris.ai/

[3] Esmaeili, A., Gallagher, J. C., Springer, J. A., & Matson, E. T. (2021). HAMLET: a hierarchical agent-based machine learning platform. *ACM Transactions on Autonomous and Adaptive Systems*, *16*(3–4), 1–46. https://doi.org/10.1145/3530191

[4] SaidotAdmin. (2022, December 13). *Intelligent Material-Management System | City of Helsinki AI Register*. Helsingin Kaupungin Tekoälyrekisteri. https://ai.hel.fi/en/intelligent-material-management-system/

[5] Toronto Public Library. (2025, January 27). *Artificial Intelligence Policy.* *https://torontopubliclibrary.typepad.com/board-meetings/2025-01-27/21-artificial-intelligence-policy-combined.pdf*

[6] *Libraries eye multiple uses for artificial intelligence - Research Information. (2025, April 1). Research Information.* *https://www.researchinformation.info/analysis-opinion/libraries-eye-multiple-uses-artificial-intelligence/*

[7] Annif - tool for automated subject indexing. *(n.d.). https://annif.org/*