

Use of Artificial Intelligence (AI) Technology Futures in Library

Suryakanth Halburagi*¹; Prashant Mukarambi²

Library Assistant, BLDE (Deemed to be University) Vijayapura.
Government First Grade Degree College Bhalki, Karnataka, India^{1,2}

Surya0142.sh@gamil.com; pmukarambi@gamil.com

ABSTRACT

AI technology is rapidly transforming the way libraries operate and serve their patrons. Artificial intelligence (AI) applications in education and research are becoming more and more significant. Products are improved, Patrons behavior is predicted, inventory is tracked, and big data is analyzing using AI. Moreover, AI agents are used to enhance the functionality of mobile devices and search engines. Data analysis, remote access to library resources, and turning the library into a hub for Big Data research are just a few of the ways AI is being examined for uses in libraries. AI is also being used to improve accessibility for users with disabilities. For example, some libraries are using AI-powered text-to-speech software to provide audio versions of books and other resources for visually impaired users. AI has the potential to carry out routine chores that currently need a human person, freeing up librarians to provide the in-depth expertise required for advanced research.

KEYWORDS: Artificial intelligence, Chatbots, remote services, mobile internet, Data Analytics, Augmented Reality.

INTRODUCTION

AI and new technology are transforming the way we think about libraries and the role they play in society. Here are a few ways in which AI and new tech are shaping the future of libraries
Improved Search Capabilities: AI-powered search engines are making it easier for patrons to find the information they need. With natural language processing and machine learning algorithms, these search engines can understand the intent behind a search query and provide more accurate results. The use of artificial intelligence (AI) technology is revolutionizing many industries, and libraries are no exception. In recent years, libraries have been incorporating AI technology into their services to enhance the user experience and improve the efficiency of their operations. One way in which libraries are using AI technology is through chatbots. Chatbots are computer programs that use natural language processing (NLP) to communicate with users and answer their questions. Libraries can use chatbots to provide 24/7 customer support and

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help users find the information they need quickly and easily. Chatbots can also provide personalized recommendations based on a user's search history and preferences (Botsandus, 2019).

Another area in which libraries are using AI technology is in cataloging and indexing. Traditional cataloging methods involve manually assigning subject headings and keywords to each item in the library's collection, which can be a time-consuming and labor-intensive process. AI technology can automate this process by analyzing the content of each item and generating relevant subject headings and keywords. This not only saves time and resources but also ensures that library materials are accurately and comprehensively indexed. AI technology can also be used to analyze user behavior and preferences to improve the library's services. By collecting and analyzing data on how users interact with the library's website, digital collections, and physical resources, libraries can gain insights into how to improve their offerings and tailor their services to better meet users' needs. In addition, AI technology can assist with digital preservation efforts. Libraries have been digitizing their collections for years, but ensuring the long-term preservation of digital materials can be a challenge. AI technology can help with tasks such as identifying and correcting corrupted files and optimizing storage to ensure that digital materials are preserved for future generations (ASIS&T. (2021, January 12)⁹. Australian Human Rights Commission. (2021)¹⁰.

OBJECTIVES

- ✓ To Improve search and discovery
- ✓ To Enhance personalized Library services
- ✓ To Digitize and preserve the library materials
- ✓ To Facilitate research activities
- ✓ To Support accessibility of library recourse

DEFINITION OF AI

Artificial Intelligence refers to the simulation of human intelligence in machines that are programmed to perform tasks that typically require human cognition, such as learning, problem-solving, decision-making, and perception. AI systems are designed to operate autonomously or with minimal human supervision, using algorithms, data, and machine learning techniques to analyze complex information, recognize patterns, and make predictions or recommendations. AI can be applied in various domains, including natural language processing, computer vision, and robotics, expert systems, and speech recognition, among others. The ultimate goal of AI research is to create machines that can think and learn like humans, but also have the ability to process and analyze vast amounts of data at a much faster rate. (*The data and Ai Landscape 2021*)¹.

LITERATURE REVIEW

The future of libraries is being shaped by advances in Artificial Intelligence (AI) technology. AI can help libraries improve their services, enhance their collections, and streamline their operations. In this literature review, we will

examine the ways in which AI is being used in libraries today and the potential impact it will have on the future of libraries.

One of the most important ways in which AI is being used in libraries is through the development of chatbots. Chatbots are computer programs that can simulate conversations with humans, providing quick and efficient assistance to library patrons. In a study by Frederick, J. K. (2020, April 2)², it was found that chatbots can help libraries improve their customer service by providing personalized assistance and answering common questions in a timely manner. The study also found that chatbots can reduce the workload of library staff, freeing them up to focus on more complex tasks.

Another way in which AI is being used in libraries is through the development of recommendation systems. Recommendation systems are computer algorithms that can analyze user data to make personalized recommendations for books, articles, and other materials. In a study by (The data and Ai Landscape 2021)³, it was found that recommendation systems can help libraries improve their collection development and provide more relevant materials to their patrons.

AI is also being used in libraries to enhance their cataloging and metadata processes. In a study by (Areportonthestateofthefield - The Library of Congress.(n.d)⁴, it was found that AI can help libraries automate the cataloging process, reducing the time and resources required to create metadata records. AI can also improve the accuracy and consistency of metadata records, ensuring that materials are more easily discoverable by patrons.

In addition to these specific applications, AI has the potential to transform the entire library experience. According to a report by the American Library Association (2019), AI can help libraries provide more personalized services, improve their outreach and engagement efforts, and create new opportunities for learning and discovery.

However, there are also concerns about the impact of AI on libraries. One concern is the potential for AI to reinforce existing biases in library collections and services. In a study by (DeNardis, L. 2020)⁵, it was found that AI algorithms can perpetuate racial and gender biases in library cataloging and classification systems. It is therefore important for libraries to be aware of these issues and take steps to mitigate them (Ayinde, L., & Kirkwood, H. (2020)¹¹.

The AI has the potential to transform the future of libraries by improving their services, enhancing their collections, and streamlining their operations. However, it is important for libraries to be aware of the potential biases and ethical considerations involved in the use of AI technology. By carefully considering these issues, libraries can ensure that AI is used in a responsible and effective manner to benefit their patrons.

AI TECHNOLOGY FOR LIBRARY SERVICES

AI technology can be used to enhance various routine services in libraries. Here are some examples.

1. **Chatbots:** AI-powered chatbots can be used to provide quick and personalized assistance to library users. Chatbots can answer frequently asked questions; help users find books, reserve study rooms, and more.

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2. **Recommender systems:** AI-powered recommender systems can help users discover new books, articles, and other library resources based on their interests and past usage patterns. Recommender systems can also suggest related materials that users might be interested in.
3. **Natural Language Processing (NLP):** NLP technology can be used to automatically tag, categorize, and summarize library resources. This can help users find relevant materials more quickly and easily.
4. **Image recognition:** Image recognition technology can be used to automatically identify and classify book covers, allowing users to browse and search for books by their covers.
5. **Digital assistants:** AI-powered digital assistants can help library staff automate routine tasks, such as scheduling appointments, managing inventory, and responding to user inquiries.
6. **Sentiment analysis:** Sentiment analysis technology can be used to analyze user feedback and reviews of library resources. This can help libraries identify areas for improvement and make data-driven decisions about which resources to acquire and promote.

Overall, AI technology has the potential to streamline library operations, improve user experiences, and enhance the value of library services.

FUTURES OF AI TECHNOLOGY IN LIBRARY

- **Virtual and Augmented Reality:** virtual and augmented reality technologies have the potential to revolutionize the way libraries engage with their patrons. With VR and AR, libraries can create immersive experiences that transport users to different places, times, and scenarios. These technologies can be used to enhance traditional library services, such as storytelling and research, as well as to create new and exciting experiences that engage and educate patrons.
- **Virtual reality:** libraries can create digital environments that simulate real-world spaces, such as historical landmarks or natural wonders. This allows patrons to explore these spaces in a way that would not be possible in real life, while also providing opportunities for learning and discovery. Additionally, libraries can use VR to create interactive educational experiences that allow patrons to learn about complex concepts in a more engaging and memorable way.
- **Data Analytics:** Libraries are using data analytics to gain insights into how their patrons are using their resources. This information can be used to improve library services and tailor resources to better meet the needs of the community.
- **Digital Collections:** With the rise of digital media, libraries are expanding their collections to include eBooks, audio books, and other digital resources. These digital collections are accessible from anywhere with an internet connection, making it easier for patrons to access the information they need.
- **Chatbots and Virtual Assistants:** Libraries are using chatbots and virtual assistants to provide patrons with quick answers to common questions. These AI-powered tools can be available 24/7, making it easier for patrons to get the help they need, when they need it.

Overall, AI and new technology are transforming libraries into more dynamic and accessible spaces, helping to ensure that they remain relevant in the digital age.

REQUIREMENTS OF AI TECHNOLOGY IN LIBRARY

Implementing AI technology in a library can improve operational efficiency and enhance the user experience. Here are some requirements to consider when implementing AI technology in a library:

- **Data Management:** AI technology requires large amounts of data to train models and make accurate predictions. A library needs to have a well-organized and easily accessible database of its collections and user data to support AI applications.
- **Robust AI Infrastructure:** An AI infrastructure should be designed to support the needs of the library, including hardware, software, and connectivity requirements.
- **Expertise in AI Development:** Libraries will need to employ or contract with experts in AI development to build and maintain the AI systems. They should have knowledge of AI programming languages, data analytics, machine learning algorithms, and related tools.
- **Training Data:** Libraries must have quality data sets to train AI models. This data must be up-to-date, relevant, and representative of the library's collections and user base.
- **Data Privacy and Security:** As libraries handle sensitive user data, it's important to have robust data privacy and security protocols in place to protect user data and comply with data protection regulations.
- **AI Applications:** Libraries need to identify specific use cases for AI in the library setting. This can include automation of library operations, personalized user experiences, recommendation engines, and other AI-driven services.
- **Integration with Existing Systems:** AI technology must integrate seamlessly with the library's existing systems to avoid disruption to operations and to make it easier for staff and users to adopt the new technology.

Overall, the successful implementation of AI technology in a library requires careful planning, significant investment, and ongoing support from experts in the field.

CONCLUSION

The future of AI technology in libraries is promising and is expected to bring about significant changes in how libraries operate and deliver services. With the advancements in AI technology, libraries can now automate various processes, enhance user experience, and improve accessibility to information. AI technology can be used in libraries to provide personalized recommendations to users, help them search for information more efficiently, and even automate mundane tasks like cataloging and indexing. AI-powered chatbots can also assist library users in answering common questions and providing support. Overall, AI technology has the potential to transform the way libraries operate and deliver services to their users. While there may be some challenges and ethical considerations to address, the benefits of AI in libraries are significant and can help libraries better serve their communities in the future.

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*Corresponding Author
