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Artificial Intelligence: Prospective and Challenges for Library Services

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ABSTRACT

Artificial intelligence (AI) has opened new paths for research in every discipline. The future is bright since AI is present in every aspect of business. Thanks to AI, libraries can now accomplish their aim more easily and effectively. Given how often AI is utilised, librarians must be creative to remain relevant. Today, information technology development significantly impacts the relationship between electronic and physical library resources.

Keywords: Artificial Intelligence, Library Prospect, Challenge, Library Services

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1. Introduction

Big data and its explosion excite modern institutions. They compete to use data processing and analysis for institutional benefit. Artificial Intelligence is a hot topic in information technology, including its potential use in libraries. Technology helps humans work better and improve quality. AI will likely be used in libraries due to their vast intellectual property and user data. Libraries handle a lot of digital content with users and social media, generating extensive data. Transaction data in libraries is increasing, requiring special applications for processing, analysis, decision-making, and service improvement.

Libraries are becoming more complex as they handle content from many sources and formats quickly. Content creation is too fast for manual methods to keep up. Information technology is crucial for completing tasks and making decisions in libraries. Recently, AI has become a popular topic in libraries, especially in national, college, special, and public libraries. College Libraries have been the most proactive in adopting AI to support research and learning. However, the use of AI in libraries is still in its infancy. AI can improve the services provided by libraries. It is uncertain whether AI can effectively replace lawyers in conducting legal research in law libraries. The benefits and drawbacks of implementing AI in educational institutions are still being discussed.

AI is said to be able to replace human labour. However, AI cannot replace human originality and inventiveness. AI can assist in research by facilitating the exploration of several data sources, knowledge mapping connecting ideas, data analysis, and the generation of predictive suggestions based on findings. AI, however, is a substitute for human intelligence or inventiveness in the development of research findings.

2. What is Artificial Intelligence

The Industrial Revolution has seen a greater role in technological developments as most machinery has been improved thanks to cutting-edge technological advancements and innovations. These creative results have a more significant impact across several industries. The capacity of an individual to use their knowledge, understanding, and insight to do tasks efficiently is known as intelligence. John McCarthy of Stanford University says that artificial intelligence is the science and engineering of creating intelligent devices and brilliant software. Artificial Intelligence often refers to a machine with some degree of human intelligence. AI is also used to learn complicated real-world problems and develop new answers via experience. AI researchers are always helpful in formulating solutions to extremely complicated situations beyond humans.

2.1 Machine Learning

One significant area of artificial intelligence is machine learning, which was among the first people to use artificial intelligence. The study area known as Machine learning provides computers the capacity to learn without explicit programming.

2.2 Deep Learning

Deep Learning's autonomic feature extraction makes it popular. With conventional processing, features are automatically extracted through design; however, with deep learning, features are automatically extracted. At each layer, the deep learning process produces a higher input abstraction.

2.3 Natural Language Processing

Natural Language Processing (NLP) enables computers to understand the main linguistic ideas in a query or response. NLP can be key in establishing a digital library in several areas, including subject indexing design, information retrieval systems, development, and bibliometrics.

2.4 Pattern Recognition

To produce observations and interpretations, any intelligence system is often trained to use cameras to detect related patterns. Recognise a human face; for instance, an intelligence vision programme would compare the face to facial features like lips, nose, and eyes.

2.5 Robotics

Library activities involve a lot of manual work. Robots can help do this work partially or fully. Technology has improved libraries in many ways. Robots now do various tasks instead of humans, hazardous and time-consuming ones.

2.6 Chatbots

Chatbots are computer programs capable of intelligent speech text or even physical expression in conversation.

3. Artificial Intelligence and Ranganathan's Principle of Librarianship

The five Ranganathan principles are the foundation of librarianship. These five guiding principles characterize the provision of library information resources and services. We see the following alignments between AI and each of Ranganathan's five laws.

3.1 Books are for use

Artificial Intelligence systems make it easier for users to access books and other information materials. Most books are now available digitally, and AIT helps users find and use these digital books more easily. As a result, people are using these materials more than ever before.

3.2 Every reader's book

Libraries serve many people with different needs. They collect various information sources to meet these needs. Each reader has a specific book or resource that fits needs at a certain time. Library users need to find these books. Intelligent systems, like recommender systems, help with this. They suggest which resources the library should get and recommend the best materials to users based on their needs.

3.3 Every Book its Reader

Every book shouldbe in the library, even if only a few people might read it. To follow this law, we need to ensure all books are accessible and find their audience. AL helps by suggesting books to users based on their interests, improving search functions, and promoting less popular books to the right readers.

3.4 Save the Time of User

AI speeds up the search process, helping readers find what they need as early as possible and efficiently. For example, AI search engines can deliver more accurate and relevant results by understanding natural language queries and user intent. Chatbots and automated reference services can reduce wait time by instantly responding to frequently asked inquiries. AI can also help with digital archive management and organisation.

3.5 Library is a growing organism

AIcan potentially be vital to libraries' ongoing development and expansion. By analyzing data on usage patrons, AI can support libraries in making well-informed decisions about new material acquisitions and service development. Moreover, AI tools can support ongoing training and professional development for library staff, ensuring they stay updated with the latest technologies and best practices.

4. Library Processes and the Application of Artificial Intelligence

4.1 AI for Cataloguing

AI is used in cataloguing because it follows specific rules (AACR2). There is two ways AI can assist with cataloguing. First, a person and an AI system can work together through a computer interface. Second, AI can fully automate cataloguing by processing digital text with little or no human help.

4.2 AI for Circulation (OPAC)

The circulation section in the OPAC can facilitate the effortless retrieval of library materials with the aid of artificial intelligence. NLP can help break down linguistic barriers, and aid in retrieving pertinent information from databases, indexes, and catalogues. When requesting information, users can express their needs in their native tongue, which facilitates and improves the effectiveness of the search and retrieval process.

4.3 AI for Reference Services

Smart systems help library users find the information they need. These systems focus on answering questions and providing resources. More work is done on these systems than on other library services. They help users get answers in real time using digital tools and services.

4.4 AI for Collection Development

AI resources can be useful in choosing vendors for library materials. An intelligent system can pick a vendor based on past successful deals. These are handy tools for buying rare items, including conference proceedings, foreign language publications, and technical reports.

4.5 AI for Indexing

Artificial Intelligence tools are being created to index library materials, particularly magazines. Indexing is important for finding documents. The goal of indexing is to improve accuracy**.**

5. Benefits of Artificial Intelligence Application in Libraries

To benefit from AI in libraries, staff should view AI not as a threat to jobs and traditional practices but as a helpful tool. Other Professions use AI to solve real-world problems. Libraries can do the same.

5.1 AI Improves Operational Effectiveness and Efficiency

Libraries can enhance their services with AI. AI helps provide better information resources and improves service quality. It also lowers costs through automation and digital asset management optimized research data governance is another benefit.

5.2 Opportunity to Engage Larger Audiences

By using chatbots and location-based services to improve search engine results, the library can offer information services to a broader audience.

5.3 Helps Library Staff Achieve their new Goals

AI can reduce manual tasks like daily searches and referencing, minimizing human errors and inefficiencies. These smart systems let library staff focus on more valuable tasks. They can help users make reading lists, teach better research skills, build library resources, and more.

5.4 Establish Libraries at the Centre of the New Scholarly Information Landscape

Libraries can help share data and research across many fields. They can link to open publishing institutions.

They create research tools that work with other institutions. Their collections become easier to search and explore.

This helps build a large, high-quality resources network**.**

6. Challenges of Artificial Intelligence Application in Libraries

Artificial Intelligence faces challenges in technology, society, and economics. Despite librarians and Library staff recognising the value of new technologies, concerns like these AI are being widely used in information management.

These challenges are the following:

- Financial Uncertainty
- Openness to Change
- Technical Knowhow and Slow Learning Curves among Library Staff
- Users' Privacy
- Linguistic Capabilities
- Understanding of Users' Emotions

7 . Conclusion

Artificial Intelligence is a growing technology in libraries. AI can improve how information is provided, processed, used, and secured in libraries. Library and information science (LIS) researchers should work with AI experts to solve problems in teaching and research. This will create new opportunities in librarianship. It will also make providing information resources and services more effective and efficient. Although AI is used in many library tasks, most applications are still theoretical and not fully implemented. Librarians should not fear losing their jobs to AI. Instead, they should learn to use these systems to improve their productivity.

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