USE OF AI TOOLS IN LIBRARY OPERATION AND SERVICES

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Abstract

The ultimate goal of "Artificial Intelligence" in libraries is to create computer systems. That is capable of deduction, acting, and even outwitting human intelligence. This has significant consequences for the profession of librarianship. In recent years, library technology has seen an explosion in the use of artificial intelligence. Virtual Reality for immersive learning, book reading and shelf-reading machines, and expert systems for reference services are a few examples. While the integration of artificial intelligence may appear to estrange librarians from their users, it is more likely to enable libraries to accomplish more rather than supplant librarians. The field of artificial intelligence (AI) has opened up new opportunities for advancing research across all fields. The future looks bright because artificial intelligence technologies are present in every aspect of business. The usage of AI has greatly aided in the provision and utilization of library information resources as well as in achieving the aims and objectives of the library. AI has many uses in libraries, from book publishing to book distribution, therefore librarians must think creatively to remain relevant in their roles. Its use opened up a number of new options for the library, including the ability to link electronic and physical resources and to link tangible items and artifacts with video assistance. The article explored a number of artificial intelligence (AI) components, and the services that libraries can use it for their operational and services.

Keywords: AI Tools, AI in Library Operation, Principle of Librarianship, AI in Library Services.

INTRODUCTION

Artificial intelligence (AI) refers to a digital computer or computer-controlled robot that can accomplish tasks usually carried out by intelligent beings **(B.J. Copeland, 2023).** Artificial intelligence (AI) has entered the mainstream in 2022 thanks to a widespread familiarity with the Generative Pre-Training Transformer. It's being applied with the goal of improving learning, logic, and perception. Currently it being used in a number of industries, from the financial sector to the healthcare industry, as well as education sector. **According to Frankenfield, J. (2023)** The American Library Association (ALA) asserts that artificial intelligence (AI) is crucial to libraries because it may be used to organize and make vast knowledge collections accessible. Artificial intelligence is the name given to the modern technology used to manage the digital library. The creation of computer systems or computers with the capacity to reason, act, and even surpass human intelligence is the ultimate goal of artificial intelligence. It is evident that accomplishing this goal might have a major effect on the field of librarianship. Artificial intelligence and other forms of technology enable intelligent library automation systems to provide knowledge-based services to staff and users. According to **Li, Huang, Kurniawan, and Ho (2015)**, this invention won't replace librarians. Rather than that, the system would give priority to getting rid of time-consuming and ineffective jobs in libraries, such shelf reading, so that librarians spend more time to interacting with users. Artificial Intelligence systems are able to imitate human behaviour and, as a result, take the place of a human in the library.

Artificial Intelligence is increasingly expanded, and it should be adopted and implemented in libraries. Academic libraries are the primary locations where these intelligent technologies are used, often through the implementation of different library procedures. The real importance of artificial intelligence (AI) on our society is demonstrated by its main applications, not by its technological uses. The aim of artificial intelligence applications is to automate human tasks. Artificial intelligence and libraries together have the potential to be a major advancement for the field of libraries. AI offers more efficient methods to enhance services like recovery, investigation, and exploration. Human abilities can be enhanced and improved by intelligent information systems. Artificial intelligence can be applied by library staff to all facets of providing information resources and services to library users. AI will be able to offer insights on content collections, as well as speedy content transmission across a range of services. The cooperation systems will eventually develop as a result of the improved ties between information technology users and library professionals **(Ajakaye, 2022).**

METHODOLOGY

This study has passed a systematic review process. A well-defined and organized procedure that evaluates and compiles the finest research that is available on a certain subject. The subject contain are collect from reputed journals and analyses in a systematic manner. The content analysis consist of theoretical induction and literature review.

Objective of the study

- Find out the benefit of AI in library operation and user services.

- Benefits and Challenges associated for adoption of AI in libraries.

- Involvement of AI in digital age librarianship.

- How AI fulfill the library principles.

Components of Artificial Intelligence

- **Chatbox:** A chatbox serves as the graphical user interface for a certain chat application. Chatboxes are often employed as a pop-up window on a company's website, allowing users to involve with either a human agent or an artificial intelligence bot **(Fannema, 2022)**. Integrating a chatbot in the library might significantly augment user involvement and assistance. It offers round-the-clock user support, providing prompt responses and supplying users with essential information. Additionally, it offers personalized recommendations for books, journals, and resources. An adept and intuitive chatbot has the prospective to improve the user experience as a whole and broaden the accessibility of library resources to a larger demographic.

- **Robotics:** The incorporation of artificial intelligence and robotics in libraries has the potential to introduce ground breaking advancements across all facets of library services. Robots equipped with computer vision and machine learning algorithms can sort and arrange books. AI-driven robots can do routine inventory audits, guaranteeing the library's

catalogue remains current. This facilitates the prompt identification of missing or misplaced objects more efficiently than manual techniques. Can facilitate users in finding books inside of the library by exploring the shelves and directing them to the appropriate aisle or area. Smart surveillance systems can be used to improve library security.

- **Natural Language Processor:** Natural Language Processing (NLP), an area of Artificial Intelligence (AI), seeks to comprehend the semantics and also connotations of human languages in their natural form. The primary objective is to extract significant information with text and develop data models using the obtained insights. Some of the main functions of NLP are, text classification, text mining, sentiment analysis, analysis of text, words sequencing, speech recognition and creation, translation by machines, and dialog systems. Integrating Natural Language Processing (NLP) into libraries can greatly improve productivity and user experience. It can improve the library's search functions, enabling patrons to submit more authentic and sophisticated inquiries. Additionally, NLP can aid in providing translation services for languages within the library, thereby enhancing the accessibility of resources to a wider audience.

- **Big Data:** The objective of big data is to enhance current technologies by gathering, storing, maintaining, managing, and analysing an extensive volume of data. In the era of abundant data, the efficient utilization of data has expedited technological progress, leading to increased inquiry in the fields of science and technology through the transformation of traditional learning methods. Libraries can utilise the big data analytics to examine user behaviour, choices, and trends in order to enhance their services.

- **Text Data Mining:** Text mining is a methodical approach to discovering, retrieving, and extracting valuable and meaningful information from a vast amount of unstructured as well as unclassified textual data. Text mining is widely used in library services for many purposes such as classification, keywords extraction, and recognition of named entities, topic modelling, and clustering. These applications help libraries improve their efficiency in information management, information retrieval, and decision making **(Arshad, M, 2020).**

- **Pattern Recognition:** Pattern recognition is a data analysis approach that uses artificial intelligence algorithms to automatically find regularities as well as trends in the data. The data can take many forms, including but not limited to text, images, sounds, and other detectable aspects. Pattern recognition algorithms can quickly and accurately detect identified structure. The integration of artificial intelligence (AI) in libraries has the potential to significantly improve numerous aspects of library functionality and the overall user experience. The constituents of pattern recognition include data collecting, preliminary processing, extracting features, selecting models and training, and evaluation.

AI in librarianship principles

The foundation of librarianship is the five Ranganathan's principles. The delivery of library information resources and services in the library is characterized by these five core values **(Ajakaye, 2022).** The brief is describe below how AI aligning with each principles.

1. **Books are for use:** The utilization of the library's information resources is encouraged by all procedures and activities. Artificial intelligence technologies facilitate the usage of books and other information resources by increasing their accessibility. Now that most books are available digitally, people can use them more than ever before because of their increased accessibility.

2. **Every reader his or her book:** Libraries reflect to a diverse range of users, despite the specific type of library. Hence, the library procures information resources to cater to a diverse range of need. Each person possesses a certain book or informational resource that fulfills their current information requirements. It is crucial that library patrons get the book. The existence of intelligent systems, such as the recommendation system, enables this capability. In addition to suggesting resources to the collection development librarian for acquisition, it can also suggest to the user the best available information that fulfills their information needs.

3. **Every book its reader:** Every book possesses its own specific target reader. It is inappropriate to utilize or leave books or other information resources on the shelf. These resources need to have a designated in the library. AI facilitates the interaction between users and books by establishing a mechanism that not only attracts people to the book but also delivers the book to users.

4. **Save the time of readers:** The primary objective of implementing AI in libraries is to attain the highest point of success. Users become increasingly occupied and become less patient of delays. An intelligent system efficiently interprets the requirements of a library user and promptly provides responses to their queries. Additionally, a sophisticated algorithm enables the identification of the most efficient path from the user's present position to the location of an information resource within the library. This intelligent technology is capable of detecting the locations of users and books, and provides directions to facilitate their interaction.

5. **Library is a growing organism:** Libraries have changed during the past ten years. This is because a library is an adaptable institution and should never have a rigid perspective. There was a certain amount of development in the theory and practice of librarianship. Implementing AI in library and information centers leads to expansion and improved service for library users.

Application of AI for delivering library services

Academic libraries need to reinvent their roles in the digital age to better capitalize on the possibilities of artificial intelligence by improving the quality of services they provide **(Tella, 2020).** Artificial intelligence provides a highly beneficial and efficient approach to use this information and attain superior outcomes. Libraries are positioning themselves to utilize advanced technologies, including AI, to assess the quality of their services.

The areas of library which shows the importance of AI includes:

- **Reference Services:** A library's primary function is to provide reference services, and an expert system can take the role of a reference librarian in this regard. Expert systems can ask the user what kind of information is required and then present resources that might include it.

- **Research**: It is a system designed to give users with standard sources that they may use to search for specific topics. This is a system that teach reference skills or provides automated assistance for reference librarians as well as information professionals who are practicing their skills.

- **Pointer:** Knowledge-based systems are another name for this type of system, but it functions more like a computer-supported reference program. As a result, users are directed to reference materials.

- **Online Reference Assistance (ORA):** This system aims to enhance the support services provided by an institution's reference librarian for low and medium level inquiries by utilizing a diverse variety of technologies.

- **Answer-man:** The system is a platform that assists users in handling reference questions related to agriculture, based on their skills. It is equipped with a series of choices that eliminate unnecessary queries and narrow down the type of tool that is required. It can serve as either an aid system or a user interface for various databases and CD-ROM reference tools, effectively fulfilling both of these roles.

- **PLEXUS:** A benchmarking tool is a resource commonly employed in public libraries. This encompasses understanding the reference methodology, gathering data on certain subject areas, identifying the sources of references, and serving library users.

Application of AI in library operation

- **Cataloguing:** As the earliest library craft, cataloguing is a well-known method. Since descriptive cataloguing is regarded to be rule-based (AACR2), the current efforts for automating cataloguing through the use of expert systems have focused on this particular method. The incorporation of artificial intelligence processes into cataloguing can be accomplished in two different ways.

  - ➢ An interface that divides the intellectual effort between the intermediary and the support system, facilitating communication between humans and machines.

  - ➢ A strong Expert System with extensive cataloguing functionalities, seamlessly compatible with an electronic publishing system. This allows for automatic processing of texts as they are created online, eliminating the need for any intellectual intervention from an intermediary throughout the skill-based system and cataloguing processes.

- **Classification:** Another challenging area for an expert system is classification. The relationship between objects and classes is frequently confusing, and while there are recommendations available to determine classification numbers and subject headings, without any hard and fast rules. Research on creating mechanisms for allocating class numbers and subject headings is moving forward.

- **Indexing:** Expert systems have been created specifically to index publications. Selecting and allocating restricted vocabulary terms that share the same conceptual meaning as the verbal descriptions entails defining concepts and translating them into verbal descriptions for indexing periodical articles. Improving the consistency and quality of indexing is the goal of automating the cerebral parts of the process. The algorithms are able to assign proper subdivisions on their own by using the data that the indexer provides to determine relevant favoured terms. The system is capable of drawing inferences and then carrying out appropriate actions. 'Med Index' is a model indexing system that is applied to library indexing tasks. Only a small percentage of library users have access to knowledge-based systems. Customers usually don't use these technologies very often because they aren't good enough for regular library users.

- **Acquisition:** The process of selecting and acquiring materials for a collection section is a crucial component of the library. The librarian as well as information officer plays an important role in this endeavour. Library users play a vital part in the development of e-collections, and it is necessary to seek their assistance and suggestions during this process. Multiple systems have been incorporated. Monograph Selection Advisor is an innovative application of this rapidly growing technology in the profession of library science, namely in the development of library collections. The task being modelled is the systematic process by which a subject bibliographer selects specific details about a monograph. The knowledge repository must possess a comprehensive scope, while the interface should be user-friendly, enabling the library to effortlessly access the essential information from the device **(Banerjee, M, S, 2022).**

- **Circulation (OPAC):** The OPAC's circulation area can make it easier to retrieve library materials with the aid of Artificial Intelligence (AI). The NLP can help break down linguistic barriers and aid retrieve pertinent information from databases, indexes, and catalogs. When searching for information, users can express their needs in their native tongue, which facilitates and improves the effectiveness of the search and retrieval process. Users can now specify intricate retrieval languages thanks to this. The employment of AI assistive technology in search tools can help library users. Libraries are increasingly offering digital resources and services, but still rely heavily on printed materials. Academic and research libraries in particular are facing severe space and skill constraints as a result of the combined push to provide both print and electronic information resources and services. The use of AI technologies can assist in resolving these issues **(Ajakaye, 2022)**.

- **Collection Development:** An AI system can be developed to identify a vendor by analyzing their past successful transactions in supplying publications. These technologies would be especially valuable in acquiring non-standard information materials, such as conference proceedings, journal publications in foreign languages or nations, and specific technical reports. Furthermore, research has shown that Artificial Intelligence (AI) systems have been created in the field of librarianship to aid in the selecting process.

Impact of AI in library

The use of AI in libraries must change the way library employees see it in order for them to gain from it. Librarians and management can benefit from, how AI falling impact on library task. Some of ways are discuss below how AI impact on library.

- **E-Resource Management:** Artificial Intelligence (AI) simplifies the operation of digital collections by computerizing operations like content management, classification, and metadata harvesting. Identifying and categorizing content according to its format. The topic matter, or relevance is made simpler by machine learning algorithms, which facilitate the cataloging and retrieval of digital resources.

- **Virtual assistant:** The virtual assistants are using by libraries to offer 24/7 customer support. These AI-powered tools assist users in navigating library resources and services, offering research guidance, reference services, and answers to frequently asked questions.

- **Archiving Digital Materials:** AI facilitates in the preservation and conservation of library collections using improved visualization, digitalization, and restoration technologies. Artificial intelligence algorithms can improve image quality, eliminate distortion and artifacts, and repair damaged or deteriorating materials, assuring the long-term preservation of cultural possession.

- **Security and Privacy**: AI solutions assist libraries in safeguarding sensitive user information as well as ensuring compliance with privacy rules. AI-powered security systems can detect and mitigate cyber security threats, identify aberrant behavior, and protect against breaches of information, ensuring user security and confidentiality.

- **Improve Accessibility:** AI technologies improve accessibility services by offering capabilities like picture identification, speech detection, and automated speech conversion for users with disabilities. By allowing users to interact with library resources in alternate formats, these solutions increase information availability and accessibility for all.

CONCLUSION

The utilization of "Artificial Intelligence" is an emerging technological advancement within the domain of librarianship. The enactment of Artificial Intelligence in libraries holds great promise in terms of facilitating and enhancing the provision, processing, utilization, and security of information materials. Experts in AI and LIS researchers should work together to resolve instruction and research issues associated with the implement of AI in libraries. It is crucial for libraries because it enhances user experiences, boosts productivity, and enables them

to adapt to the always shifting information environment. The issue that, in the not-too-distant future, artificial intelligence will be able to resolve in every discipline, owing to the creation of competent models that integrate AI techniques. To improve technical services, namely in the fields of information processing and administration, a sophisticated expert system will be developed. The fields of information science and library science will profit immensely from this arrangement.

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