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ARTIFICIAL INTELLIGENCE USING LIBRARY INFORMATION SCIENCE PROFESSIONALS

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ABSTRACT

Artificial intelligence (AI) is a growing trend in libraries, enabling computers to perform tasks that would require human intelligence. The ultimate goal is to develop machines that rival human intelligence, impacting librarianship. AI applications using LIS professionals and managers of organizations in libraries include expert systems for reference services, book reading robots, and virtual reality and the professional skills and necessary technological skills needed for library science professionals and managers for immersive learning. Although it may seem alienating to librarians, AI will likely enhance library operations and services, making them more relevant in an ever-changing digital society. It will also enhance service delivery and improve library operations, making them more accessible to users.

Keywords: Artificial Intelligence, AI in Libraries, AI in Application, AI in Library Services, AI Chatbots, Robots in Libraries, Intelligent Libraries, Smart Libraries

1. INTRODUCTION

The rapid advancements in Artificial Intelligence (AI) have revolutionised various sectors and libraries are no exception. This article aims to provide a comprehensive review of the application of AI in libraries and its impact on library operations. By analysing a collection of relevant articles from the Scopus database, this study offers researchers valuable insights into integrating AI technologies within the library context. The methodology employed for this review involved identifying and analysing 65 articles related to AI in libraries. These articles were carefully reviewed, and their key findings and summaries are presented.

This review provides an in-depth understanding of AI's potential applications and benefits in library operations by exploring diverse topics such as AI chatbots, intelligent libraries, robots in libraries, and smart libraries. The literature review begins with examining early research on AI in libraries, including studies on expert systems and their impact on information access. It then explores the use of AI-based library systems for software reuse, digital video libraries, and multilingual access to library resources. The review also covers AI applications in digital library search engines, academic law libraries, and library service management using RFID and wireless techniques. Furthermore, this article discusses the implications of AI on the future of libraries and the potential challenges and opportunities it presents. It delves into the impact on library services, employment, and the need for regulations and ethical considerations.

The review also highlights the role of libraries in embracing AI technologies and providing lifelong learning opportunities to their communities. By presenting a comprehensive summary of the literature on AI in libraries, this article serves as a valuable resource for researchers interested in exploring the potential of AI in enhancing library operations. The insights gathered from these studies contribute to the growing body of knowledge on AI in libraries and provide a foundation for further research and implementation of AI technologies in the library field.

Intelligence is the ability to think and learn facts and skills and also apply them when necessary. The prospect of developing computers or machines that perceive, learn, reason and behave like human beings has fascinated many people. Humans are born with an innate ability to perceive, reason/think and act, which develops and improves over time as a result of so many factors. Intelligence in humans is measured by the Intelligence Quotient (IQ) obtained through series of aptitude test focusing on different aspects of intellectual functioning. Similarly, developing intelligent computers that perceive, think and behave like humans is the crux of Artificial Intelligence. Intelligence in computers or machines depicts their ability to accomplish specific task in the presence of variability and monitor its environment and appropriately adjust its actions based on what it has sensed as prerequisites for intelligence.

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2. LITERATURE SURVEY

Balleste, R, et.al [5] "The Future of Artificial Intelligence in Your Virtual Libraries" provides a primer on artificial intelligence (AI) in library service. The author explains what AI is and what it can do for libraries, giving examples and listing vendors to contact for further information. The author, who has experience implementing AI, aims to dispel the misconception that AI is only found in science fiction and presents AI as a relevant and valuable technology for libraries in the 21st century. Balleste, R.et.al [6] explores the potential of artificial intelligence (AI) in law libraries. The author emphasises the role of libraries in designing and programming AI systems to enhance public services. While acknowledging the challenges of implementing AI technology in complex transactions like legal reference interviews, Balleste highlights the possibilities offered by intelligent systems to supplement and expand library services. The article discusses the conceptualisation of AI systems, their programming through algorithms, and the use of avatars or graphical displays to facilitate interaction with library patrons. Balleste envisions AI assistants as valuable tools that can assist librarians in performing menial tasks and improve patrons' experience at library websites. The author also speculates on the future potential of AI in law libraries, suggesting its application in areas such as reference services, circulation operations, and cataloguing. Balleste's article provides a thought-provoking glimpse into the evolving role of AI in law library settings. Alberico, R. et.al [7] predicts the impact of expert systems and artificial intelligence on libraries over the next ten years by considering five areas: knowledge media, knowledge industries, knowledge institutions, modes of discourse, and implications. The predictions are based on existing technology, but the author acknowledges that technological advances may occur in the future. The author references

the publication "Libraries of the Future" as a relevant and on-target prediction for the future of libraries and artificial intelligence. The author also mentions Project Intrex, an early experiment by MIT to develop an electronic library, incorporating many technological solutions to the problems faced by libraries. R-Moreno, M. D., Castaño, B., Barrero, D. F., & Hellín, A. M. et al. [8] discussed using RFID and wireless techniques for efficient library service management. The review highlights the application of RFID in libraries to determine the physical location of books and assist users in navigating the library. The prototype system, named SIGUEME, combines RFID sensors, AI-based planning and monitoring, and screen-based information display. The integration of RFID and wireless sensor networks (WSNs) is explored, emphasising the expanded functionality and reduced costs. The review also examines the application of RFID and WSNs in healthcare, logistics, and libraries, discussing the benefits and challenges in each domain. Experimental results from the implementation of SIGUEME in Meco's Public Library are presented, showcasing the system's capabilities in tracking users, generating statistics, and providing guidance. Wu, J., Williams, K. M., Chen, H.-H., Khabsa, M., Caragea, C., Tuarob, S., Ororbia, A. G., Jordan, D., Mitra, P., & Giles, C. L et al. [9] presented an application of artificial intelligence (AI) technologies in CiteSeerX, a digital library search engine. The review highlights key AI techniques for document classification, de-duplication, metadata extraction, and author disambiguation. It emphasises the unique features of CiteSeerX, such as open access to full-text scholarly documents, automatic extraction of metadata and citation context, and indexing of paper entities like tables and figures. The review discusses the challenges and performance of these AI technologies and their transferability to other digital libraries. It also describes the architecture of CiteSeerX and the use of open-source software in its development. The review highlights the cost and scalability challenges of rebuilding a system like CiteSeerX from scratch. Talley, N. B , et.al [10] "Imagining the use of intelligent agents and artificial intelligence in academic law libraries" discusses the potential benefits of incorporating artificial intelligence (AI) and intelligent agents into academic law libraries. The author distinguishes between the two technologies and provides examples of how they can be used in academic law libraries, such as conversational agents for reference and circulation and information literacy modules. The article also highlights the benefits of using AI and intelligent agents, such as improving services provided to the law school community and library patrons. The author encourages academic law librarians to embrace AI and champion its use to benefit the law school community. Oyelude, A. A. et.al [11] "What's Trending in Libraries from the Internet Cybersphere - Artificial Intelligence and other Emerging Technologies" presents a report on the latest technology trends in libraries, including the increasing use of artificial intelligence. The article is based on information from blogs and wikis and highlights the increasing demand for AI-related skills in the workforce. The report also discusses the potential implications of AI for the crew and the need for regulations to govern the use and creation of AI, including creating an "electronic personhood" status. The article also covers Google's effort to incorporate machine learning into all its products, such as wearables, using Android Wear 2.0 as an example.

3. METHODOLOGY

Virtual libraries are electronic libraries that provides access to distributed information resources in electronic format to users in remote locations. It is a term used to denote libraries without walls, an organised collection of links to various information resources on the network or Internet. It is a collection of electronic information resources in form of e-books, journals, online databases, media and other forms of data. Typically, virtual libraries provide remote access via an online portal or gateway, of information resources in varieties of contents/formats, including online databases, e-books, e-journals, e-magazines, e newspapers etc, and provides other services traditionally offered by libraries. The virtual library environment means virtual communication between the library and the patrons, virtual services delivery, virtual information access etc. Users are able to view and request or access the library's information resources from their various offices or homes over the Internet. All forms of communications to the library is through e-mails, phone, fax or the video/audio/text communication system offered via the library's portal. Such libraries organises tele-training for their users, webinars, online video conferences etc. to keep their users abreast with their services and development. An interchangeable or closely related term is the digital library. Digital and virtual libraries have their services fully automated. Moreover, automation is the process of using machineries to facilitate human activities and saving the human power and time. Library automation refers to the use of computers to automate the routine procedures in libraries such as cataloging, user registration, charging and discharging of books, shelf-reading etc., it the technology concerned with the design and development of the process and system that minimizes the necessity of human intervention in library operations. The main purpose of library automation is to free the librarians and library staff and to allow them to contribute more meaningfully to spread of knowledge and information. Artificial intelligence play a vital role in library automation especially in digital and virtual libraries where their resources and services are fully computerised. In fact, most automated library systems incorporates one or more areas of artificial intelligence in the design and implementation of the system such as:

1. Automatic keyword indexing and abstracting of electronic resources via the use of Expert Systems.

2. Internationalisation/translation of electronic resources (text, audio) through the use of Natural Language Processing and Optical Character Recognition.

3. Digitisation of printed materials. This deals with the conversion of traditional library materials into electronic format through scanning or Optical Character Recognition to facilitate searching and retrieval.

4. Automatic textual analysis through the use of Decision Support System (DSS).

5. Information retrieval through the use of speech recognition and Natural Language Processing.

6. Automatic analysis and retrieval of audiovisual resources via the use of Expert Systems/ Optical Character Recognition.

7. The application of data processing systems to support clerical and repetitive functions found in technical processing of books (cataloguing), circulation control (charging and discharging of books) and serial management (tracking magazines, journals and newspaper holdings).

8. Multiple access to information resources and round the clock services delivery via the use of intelligent/ advanced automated systems.Other digital and virtual library systems built based on intelligence system approach/algorithm include the online public access catalogue and online database gateways. These systems use meta-control and memory management to map knowledge in their various storage locations and control various processes involving data structure, characteristics and description in an intelligent manner.

4. CONCLUSION

To thrive in the new knowledge economy, libraries must innovate their services and re-examine practices. Artificial intelligence can be applied to enhance technical, reference, circulation, resource management, and information retrieval/dissemination services. Despite potential job loss, AI will enhance library operations and services delivery, making them more relevant in a digital society. This technology will also improve library operations and services delivery. AI applications uses LIS professionals and managers of organizations in libraries include expert systems for reference services, book reading robots, and virtual reality and the professional skills and technological skills for library science professionals and managers for immersive learning is needed. Artificial intelligence is seen as a vital link between librarians and the human touch in libraries. The eventual integration of AI into library services will reveal its potential in librarianship, as it will not diminish the human touch or erode the connection with patrons.

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