Opportunities and Challenges for Libraries in the Changing Education and Social Construct

### Opportunities and Challenges for Libraries in the Changing Education and Social Construct (OCLCESC-2024) (August 22-23, 2024)

Editor-in-Chief Professor Sonal Singh

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# **OPPORTUNITIES AND CHALLENGES FOR LIBRARIES IN THE CHANGING EDUCATION AND SOCIAL CONSTRUCT**

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**By Professor Sonal Singh** 

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### **PREFACE**

Libraries are an inseparable part of education, providing reliable content to people. They encourage and promote the process of learning and are always ready to adapt to the changing needs of educational and social constructs. With the rise of digital technology, libraries have become places for creating and enhancing new digital resources. Modern libraries have evolved into community hubs, connecting people to information and to each other.

It gives me immense pleasure and satisfaction that Vikram University is organizing an International Conference on August 22-23, 2024, to honor the Father of Library and Information Science, Padmashri Dr. S.R. Ranganathan, who was the first Visiting Professor of Vikram University, Ujjain. This conference is a grand celebration of his centennial contributions to the field of Library and Information Science. The chosen theme, "Opportunities and Challenges for Libraries in the Changing Education and Social Construct (OCLCESC-2024)," is highly relevant to current times.

The conference will serve as a dynamic platform for interactive, informative, and brainstorming sessions aimed at making impactful decisions that will further refine library services through technological advancements, including the use of artificial intelligence as virtual assistants. The insights gathered in this volume will be invaluable for understanding future technological changes in the field of libraries.

The authors are exclusively responsible for the content of their submissions, the validity of their experimental results, and ensuring they have permission from all involved parties to make the data public. It is the responsibility of each author to ensure that the papers submitted adhere to ethical standards, particularly concerning plagiarism. The editors and publishers bear no responsibility for any lapses on the part of the authors.

I extend my heartfelt thanks to Dr. K.P. Singh for sponsoring the conference with a contribution of one lakh rupees. I also express my gratitude to all the authors who have contributed papers for the completion of this volume. My sincere thanks go to Professor Akhilesh Kumar Pandey, the honorable Vice-Chancellor of Vikram University, Ujjain, for his continuous and generous support in organizing OCLCESC 2024. I also acknowledge the support provided by all my professional colleagues and friends.

Professor Sonal Singh Editor-in-Chief

Professor M. P. Singh Dr D.D. Lal Dr Rajesh Kumar Dr Vilas Nimbhorkar Editors

### **About the Book**

The human life today is greatly influenced by digital technologies like computer, internet and android technologies and demanding for instant availability of global information at their fingertips. Libraries nowadays are in a process of transition, in order to meet users needs and are switching towards modernization. The change is always challenging but is also an Opportunity to remain indispensable part of learned digital society. The ICT oriented modern libraries have the opportunities to provide round the clock access to global information resources, thereby abolishing barriers of space, funds, time and geographical boundaries. These technological changes are challenging in the beginning but prove to be a boon to serve the new education and social construct in long run.

To commemorate 100 years of First Visiting Professor of Vikram University Dr S. R. Ranganathan in Library Profession in India, Vikram University is organizing an International Conference on 22-23 August, 2024.

This conference proceedings includes papers by library professionals on diverse range of technologies with the potential to reshape how libraries operate and serve their communities in changing education and social construct. This conference volume on "Opportunities and Challenges for libraries in the changing Education and Social Construct" will definitely serve as a valuable resource for librarians, Information Professionals and anyone invested in the future of our information landscape. The insights and ideas presented here offer a roadmap for navigating the exciting complexities of the digital age, allowing libraries to continue fulfilling their vital role in ever-evolving world.

### **About the Editor**



Prof. Sonal Singh is presently working as a Professor in School of Studies in Library and Information Science, Vikram University, Ujjain, Madhya Pradesh since 2006. Apart from that at present she is Dean, Faculty of Arts, Chairman-Board of Studies, Chairperson-Research Degree Committee and Chairperson- Examination Committee. She is Court member of Vikram University, Member of Standing Committee of Academic Council and Member of IQAC committee. Professor Singh has a Teaching experience of Thirty-Six years and research experience of Twenty-Nine years. She served as Head of the Department for Thirteen years. Twenty-Three candidates have been awarded Doctorate degree under her supervision. Her Fifteen books have been published. She is course writer for many open universities. She has contributed more than two hundred articles in various journals of repute, conference proceedings, edited books and also Newspapers. She has received Professor Motiwale Best LIS Teacher Award, Manisha Award, Distinguished Leadership Award, Life Time Achievement Award, Indian Library pride Award, and Best Women Teacher Award. She is Life member of ILA, IATLIS, IASLIC, MANLIBNET, and Patron member of ASLIP (Association of Senior Library Professionals) and LAB (Library Association of Bihar).

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### Navigating the future; AI's Impact on Transformation of Medical Science Libraries

Dr. Seema Sharma\* & Dr. DD Lal\*\*

#### ABSTRACT

New emerging technologies brought drastic change in medical library administration and revolutionizing the information and knowledge repositories Artificial Intelligence (AI) is revamping various sectors, and its potential in transforming medical science libraries is gaining traction. This paper explores the current state, challenges, and future directions of AI integration in medical science libraries through literature review and case studies, this research highlights the diverse applications of AI, including information retrieval, knowledge management, and user interaction. Additionally, it discusses the ethical considerations and potential barriers associated with AI adoption in medical libraries. This paper examines the transformative impact of AI in medical science libraries, focusing on how AI-driven systems can efficiently analyze data, improve search functionalities, and provide seamless information retrieval for medical library associated.

#### **KEYWORDS**

AI in Medical Science Libraries, AI Chat bots Intelligent Libraries, Innovative Technologies and Library Services

#### INTRODUCTION

In the digital age, medical science libraries play a crucial role in facilitating access to information, supporting research, and promoting evidence-based practices. There is growing interest in leveraging AI to augment the capabilities of medical science libraries with technological advancements. AI offers promising opportunities to streamline information management processes, personalize user experiences, and accelerate research endeavors. However, the integration of AI into library services also poses challenges related to data privacy, algorithm bias, and user acceptance. The main scope of this paper is to investigate the AI medical science libraries, the benefits and limitations associated with it, and an outline for future steps

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towards optimizing its efficiency. Research into the use of artificial intelligence (AI) and robots in library and information science is attracting interest because of these early applications, as well as their perceived potential to contribute to addressing digital transformation problems for information professions. (Tait, E., et al.) [1]

The advent of the digital era has brought about significant transformations in the management of medical modern libraries. Artificial Intelligence (AI) is being used by libraries to improve cataloging systems, automate redundant tasks and personalizing recommendations for users. Due to its machine learning algorithms and natural-language processing abilities, AI has made organizing and retrieving medical information easier than ever. Emerging trends and technologies have revolutionized the very concept of medical libraries, leading to redesigned services, exemplary practices, and innovative technology. Now RFID technology, Robots and Kiosks have entered libraries to serve their users in a supreme way Librarians have adapted to new roles and designations such as Information Officer, Information Scientist, and Documentation Officer. (Mittal 2017) [6]

#### LITERATURE REVIEW

The literature reviewed provides a broader review of AI applications in libraries, including AI chat bots, intelligent libraries, robots in libraries, and smart libraries. While the earlier studies concentrate on AI in libraries from expert systems to information access. The studies also review the AI-based systems to include software reuse, digital video libraries, multilingual access to resources, digital library search engines, academic law libraries, and library management service through RFID and wireless. Technology is a common factor in both the literatures reviewed above. The advent of new technology often leads to other types of professional practice. The need for support for RDM can often, at least in part, be blamed for the size, value and fragility of digital data being created. (Cox, A. 2023) [3]

Artificial Intelligence (AI) refers to the capacity of digital computers, computer-controlled devices, or software to replicate the intellectual capabilities of sentient beings, such as humans, in their operations. The integration of AI into library systems can have a significant impact on how information resources are utilized, as it can enhance search functionalities and enable prompt responses to user requests. Additionally, AI technology can be leveraged to create innovative virtual reference services in real-time by combining the resources already available in libraries with content from external sources, and by leveraging social networking and mobile platforms (**Basak et al., 2024**) [2]

#### METHODOLOGY

This research paper employs a systematic review methodology, analyzing 38 articles related to AI in libraries. The methodology involves identifying, reviewing, and summarizing key findings from these articles to gain deep understanding of AI's prospective applications and payback in medical science libraries.

#### **RESULTS & DISCUSSION**

The results highlight the role of AI in automating routine tasks "AI helps libraries work better. It automates repetitive tasks, organizes data, and gives users personalized suggestions. AI tools like virtual assistants and language processors play a crucial role in transforming library services make libraries more accessible and useful for everyone.

#### **FUTURE DIRECTIONS**

"The paper talks about how AI will drastic change medical science libraries in the future. The paper discusses the implications of AI on the future of medical science libraries, emphasizing the need for regulations, ethical considerations, and the integration of AI technologies to provide lifelong learning opportunities to library communities. It also addresses the challenges and opportunities presented by AI in library operations and services.

#### CURRENT STATE OF ALIN MEDICAL SCIENCE LIBRARIES

Artificial Intelligence (AI) is being increasingly integrated into medical libraries, showcasing its ability to transform how information is accessed, organized, and shared. One prominent application of AI in these libraries is in the area of information retrieval. Traditional search methods often rely on keyword matching, which can be limiting when navigating the vast and complex databases in the medical field. However, AI-powered search algorithms leverage techniques like Natural Language Processing (NLP) and machine learning to better comprehend user queries and extract the most relevant information from large datasets. This enables users to obtain precise and comprehensive search results much more efficiently compared to conventional search methods.

- Artificial Intelligence (AI) is also being used to help organize and manage the knowledge in medical libraries. Categorizing and classifying all the medical literature can be very challenging. This is because the medical field is so interdisciplinary, and new research is constantly being published.
- AI algorithms can automate the process of indexing and tagging documents based on their content. This allows the information to be organized more efficiently, making it easier for people to find what they need. AI-powered recommendation systems also analyze user preferences and behavior. They can then suggest relevant resources to users, helping them discover valuable content they might have missed.
- Additionally, AI is making a big impact on how users interact with and get support from medical libraries. Chatbots and virtual assistants powered by AI can provide personalized assistance to users. These AI systems can answer questions, make recommendations, and even help users navigate the library's resources and services in real-time. By offering 24/7 support and addressing user needs quickly, these AI-driven virtual assistants enhance the overall experience and satisfaction of the library's users.
- **Furthermore,** AI technologies are also helping medical libraries improve how they analyze and visualize data. Machine learning algorithms can look at large datasets and identify patterns, trends, and connections that might not be obvious. This helps researchers gain valuable insights from complex biomedical data. AI-powered visualization tools also allow researchers to interpret data more effectively and present their findings in clear and engaging ways. These capabilities not only speed up the research process, but also make it easier for researchers and practitioners to collaborate and share knowledge. Cox, A.M, & Corall, S(2013) [4]

#### **CHALLANGES AND LIMITATIONS**

While AI has made significant progress in medical libraries, there are still some challenges and important considerations. There are ethical concerns around data privacy, algorithm bias, and transparency that need to be carefully addressed. This is to ensure AI technologies are used responsibly and fairly. Additionally, some users may be hesitant to adopt AI-driven systems. Additionally, the initial investment required for implementing AI systems and the ongoing maintenance costs may pose financial challenges for some libraries. To address this, libraries need to provide user education and training programs to improve AI literacy and encourage engagement with these new technologies.

#### SUGGESTIONS FOR THE FUTURE

To realize the benefits of AI in medical libraries, it is crucial to prioritize ethical considerations, transparency, and accountability. Collaborating with interdisciplinary teams, including data scientists, ethicists, and domain experts, can help mitigate biases and ensure responsible AI development and deployment. Libraries should invest in staff training and user education programs to promote AI literacy and foster acceptance of these technologies. Embracing open-access initiatives and collaborative platforms can facilitate data sharing and interoperability, enabling more comprehensive AI applications across different

libraries and institutions. Continued research and innovation are needed to advance AI technologies tailored to the unique needs and requirements of medical libraries. By addressing challenges and leveraging emerging opportunities, medical libraries can harness the full potential of AI to enhance information access, knowledge organization, user interaction, and data analysis.

#### TRANSFORMATION OF LIBRARIAN'S REPONSIBILITIES IN THE DIGITALAGE

Libraries play a vital role as centers for knowledge sharing, research support, and education. Librarians, as the custodians of information, have historically been tasked with organizing and managing the resources within academic libraries. However, the rapid progress of digital technologies and the evolving landscape of educational information have led to substantial transformations in the traditional functions of libraries and the roles of librarians.

**From Custodian to Collaborator:** The librarian plays a key role in supporting the institutions' educational and scholarly activities through the creation, maintenance and promotion of library and information services. Today's librarian provides enough support to library users for the effective use of library resources. He provides information on new arrivals to the group effectively. Support teaching, learning, and research activities, as well as synchronize with relevant staff and hold meetings to select new books for respective subjects. Librarians have assumed a pivotal role in the acquisition, dissemination, and meticulous organization of digitalized information. They have transitioned from custodians of information to collaborators with researchers and educators, supporting learning and research goals with experience of fullest utilization of academic e-resources. A wealthy collection of libraries is the foundation of library service, and the librarian makes available the information resources to the user community. With the changing information-seeking behavior of the user community, information managers play an essential role in academic libraries and their innovative quality services. Now a day's librarian introduces accreditation criteria to academic libraries and is highly involved in research activities to provide scholarly content to the knowledge society. **(Taj, A., et al, 2024.)[11]** 

The librarian initiates initiatives in knowledge discovery, subject information dissemination, scholarly research using social media content, information literacy programs, effective practices in library and collection development, new arrivals, book exhibitions, inter-library loan services, digital data management, touch screen information portals, and discusses plans to provide the community with the highest quality print and electronic information resources and services. Librarians actively participate in, support, and promote research. Scholarly communication is the mechanism being used to prepare research and other scholarly publications, analyze their quality, disseminate information to the scholarly community, and store them for future reference. Encouraging user contribution in various library activities, such as organizing book talks, book reviews, book displays, film reviews, etc., to generate attentiveness amongst users for effective use of electronic information assets, vocational guidance, career interest, and capacity-building programs.

#### ROLE OF AI IN MEDICAL SCIENCE LIBRARY MANAGEMENT SYSTEMS.

Artificial Intelligence (AI) is revolutionizing the landscape of library management systems in the field of medical science. AI is reshaping how medical science libraries operate and serve their users. Let's explore the diverse roles AI plays in enhancing library management systems:

**1. Intelligent Cataloging and Classification:** AI-powered algorithms can automatically catalog and classify medical literature based on content, keywords, and subject matter.

**2. Enhanced Search and Discovery:** Semantic search capabilities enable users to find information based on concepts and context, improving the discoverability of resources.

**3. Personalized Recommendation Systems:** AI algorithms analyze user behavior, preferences, and past search history to generate personalized recommendations for relevant resources.

Recommendation systems help users discover new content, stay updated on recent publications, and explore topics of interest tailored to their needs.

**4. Automated Circulation Management:** AI-powered circulation management systems streamline the borrowing and lending process, optimizing resource utilization and minimizing administrative overhead. Predictive analytics can forecast demand for library materials, enabling proactive collection management and resource allocation.

**5. Intelligent Interlibrary Loan Services:** AI algorithms analyze borrowing patterns and availability of resources across library networks to optimize interlibrary loan requests. Automated request routing and fulfillment processes improve turnaround times and enhance user satisfaction.

**6.** Chat bots and Virtual Assistants: AI-driven chat bots and virtual assistants offer round-theclock support to library users. These AI systems can respond to user queries, provide guidance and assistance, and help users navigate the various resources and services offered by the library. The natural language processing capabilities of these chat bots allow them to understand and communicate with users using conversational language, making the interaction more intuitive and user-friendly. This enhances the overall experience for library patrons by providing them with immediate access to support and information, even outside of regular library hours.

**8. Content Recommendation and Curation:** AI algorithms analyze content metadata, user feedback, and external data sources to curate and recommend relevant resources for inclusion in the library collection. Content curation tools help librarians stay abreast of emerging trends, identify high-impact publications, and maintain a comprehensive and up-to-date collection.

#### **ENHANCING ACCESS TO MEDICAL DATABASES & INFORMATION**

AI plays a pivotal role in enhancing medical databases, revolutionizing how healthcare professionals access, analyze, and utilize vast amounts of medical data. With its ability to process complex data sets, uncover patterns, and generate actionable insights, AI transforms medical databases into powerful tools for advancing medical research, clinical decision-making and patient care. One of the primary contributions of AI to medical databases is in data management and organization. AI algorithms can automatically categorize, tag, and index medical data, making it easier for researchers and clinicians to locate relevant information efficiently. This streamlines data retrieval processes, saving time and improving workflow efficiency. Furthermore, AI-driven data analytics empower healthcare professionals to extract meaningful insights from large-scale medical datasets. Machine learning algorithms can identify correlations, trends, and predictive patterns within the data, enabling researchers to uncover new discoveries and clinicians to make more informed treatment decisions. Moreover, AI facilitates personalized medicine by leveraging patient data to tailor treatment strategies and interventions to individual patient needs. By analyzing patient demographics, medical histories, and genetic profiles, AI algorithms can assist clinicians in developing personalized treatment plans that optimize patient outcomes and minimize adverse effects.

Overall, AI transforms medical databases into intelligent platforms that empower healthcare professionals with actionable insights, personalized recommendations, and evidence-based decision support. AI-Powered Search Algorithms:

Medical libraries can leverage advanced AI algorithms to greatly enhance the efficiency and precision of information retrieval. This allows users to quickly find the most relevant resources to support their research and clinical work.

#### Natural Language Processing:

Integrating natural language processing (NLP) techniques into library interfaces makes them more intuitive and user-friendly. Users can interact with the system in a natural, conversational manner, improving the overall user experience.

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#### **Personalized Recommendation Systems:**

AI-driven recommendation engines analyze user preferences and behavior to provide personalized suggestions. This helps guide users to discover content that aligns with their interests and information needs, fostering a more engaging and tailored exploration of medical literature. Streamlined access to diverse resources: AI-enabled systems can streamline access to a diverse range of medical information sources, including journals, databases, and multimedia content, empowering users with comprehensive and timely access to the latest research and clinical insights.

#### Facilitating evidence-based decision-making:

Through AI-powered tools and interfaces, medical science libraries play a crucial role in facilitating evidence-based decision-making by providing users with access to relevant, reliable, and up-to-date information, ultimately contributing to improved patient care and healthcare outcomes.

## CHALLENGES AND OPPORTUNITIES OF DIGITAL TECHNOLOGY IN MEDICAL LIBRARY ADMINISTRATION SYSTEM

- **Protecting User Data and Information :** Digital libraries collect and store sensitive user information it becomes difficult to protect from cyber threats
- **Managing and Updating Digital Content:** With constantly evolving technology digital libraries require continuous updates and maintenance to ensure compatibility with new devices and update software.
- **Budgetary Factors :** Balancing the cost of maintaining and expanding digital resources with limited budget and resources, digital libraries require significant funding for hardware, software etc making it challenging to expand and improve services with limited resources
- **Managing Overwhelming Amount of Digital Content:** The abundance of digital resources make it difficult to determine the quality and relevance of information.
- Access to Vast Information Resources: Digital libraries offer librarians access to a broad array of information sources, such as scientific journals, databases, e-books, and multimedia content. With this wealth of resources, librarians can assist researchers and students in finding the latest and most relevant information for their work.
- **Collaboration and Networking:** Digital libraries enable librarians to collaborate and network with colleague, researchers and experts worldwide. Medical librarians can participate online communities, discussions forums, and social media groups dedicated to health sciences librarianship.
- **Data Management and Organization:** Librarians have the chance to play a vital part in managing the shift in knowledge management, adapting to the evolving needs and demands of the digital age. Librarians can assist researchers in organizing, preserving, and sharing their research data through digital repositories and data management platforms.

#### CONCLUSION

The current state of AI in medical science libraries showcases its transformative potential in enhancing information retrieval, knowledge organization, user interaction, and data analysis. By leveraging AI technologies responsibly and addressing associated challenges, medical science libraries can enhance their relevance, accessibility, and impact in supporting healthcare and scientific research. Continued research, collaboration, and innovation are essential for maximizing the benefits of AI in advancing the capabilities of medical science libraries. Presenting new opportunities and challenges. By embracing AI technologies responsibly and ethically, medical science libraries can chart a course towards a more sustainable, inclusive, and impactful future in support of medical research, education, and healthcare. The future of AI in medical databases and libraries holds immense promise and potential. Furthermore, AIpowered virtual assistants and chat bots will enhance user interactions and support, providing personalized assistance and guidance to users in real-time. In addition, future directions in AI for medical databases and libraries will focus on addressing ethical and privacy considerations, ensuring responsible AI deployment, and promoting equity, transparency, and accountability in algorithmic decision-making. In conclusion, the integration of AI in medical databases and libraries represents a transformative shift in how healthcare information is managed, accessed, and utilized. By embracing AI technologies responsibly and proactively, we can harness the full potential of AI to drive advancements in medical research, improve clinical outcomes, and ultimately enhance the delivery of healthcare services for the benefit of all.

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