FROM BOOKS TO BOTS: THE CHANGING FACE OF LIBRARIES IN THE AI ERA

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Abstract :

Libraries have served as a means of preserving knowledge through access to books, journals, manuscripts, and documentary resources. With the advent of Artificial Intelligence (AI), machine learning, natural language processing (NLP), and automation, libraries have evolved into smart knowledge ecosystems that are smart. Libraries, however, are no longer what they used to be because of the introduction of Artificial Intelligence (AI), machine learning, natural language processing (NLP), and automation. This work explores how the library landscape is evolving in the age of artificial intelligence (AI), looking at the effects of AI on library services, information management, user experience, and the role of librarians. The study, which relies on secondary data from research publications, institutional reports, and global surveys, points to the fact that about 67% of libraries around the world are investigating or experimenting with AI technologies, and about 33% are already utilising AI-based solutions. AI usage is becoming more ubiquitous in information discovery, virtual reference services, automated management, metadata generation, and digital preservation. The study indicates that AI can augment, but not supplant, the role of librarians by taking over repetitive work and providing more sophisticated information services. But there are some challenges, like skill gaps, privacy concerns, ethics, etc., with the technology that needs to be addressed appropriately. The future library will be a hybrid knowledge environment where human knowledge and intelligence are integrated with intelligent knowledge and technologies to provide personalised and efficient information services.

Keywords : Artificial Intelligence, Smart Libraries, AI-based Information Services, Chatbots, Librarianship, Knowledge Management

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Introduction :

Libraries have long been considered the custodians of man's knowledge and cultural memory. Libraries have been adapting and growing with the technology and the needs of society over the ages, from manuscript collections to digital information centres. Until recent

times, libraries worked mainly on the collection, arrangement, preservation and access to print materials. The librarian was a facilitator between people and information, assisting users to find the knowledge they needed from physical resources.

The advent of computers and the emergence of information and communication technologies (ICT) have brought an important change in library functions. Gradually, the nature of library services changed with the introduction of automated cataloguing systems, Online Public Access Catalogues (OPAC), digital repositories, electronic journals and online databases. With the advent of the internet, the boundaries of libraries were extended even further as people were able to get information regardless of distance or location.

Today's world has ushered in another transformative era of development in libraries with the advent of Artificial Intelligence (AI). Artificial intelligence is the capability of a computer system to execute tasks that typically would necessitate human intelligence, such as learning, reasoning, decision-making, understanding language, and solving problems. Libraries are leveraging AI for better information retrieval, automating mundane tasks, boosting user engagement, and delivering personalised services.

This technological change has given rise to the idea of a “smart library". Smart libraries integrate regular library materials and resources with smart technology like machine learning algorithms, robotics, voice assistants, chatbots, recommendation engines, predictive analytics, and more. The technologies allow libraries to gain insight into user behaviour, suggest appropriate materials, respond to queries in real-time, and streamline their workflows.

The past few years have seen the rise of AI's significance in library services, as evidenced by recent developments worldwide. According to the latest Clarivate Pulse of the Library 2025 report, which gathers insights from more than 2,000 librarians from 109 countries and regions, libraries are investigating or adopting AI technologies (67%) compared to 63% in 2024. Additionally, 33% of libraries were engaged in active implementation phases, demonstrating the quick progression from experimentation to adoption.

One of the most apparent shifts in library-user interaction is the emergence of AI-powered chatbots. Users can get answers to the most common questions, information about the library resources, and help with database searches without waiting for a reference librarian. Likewise, AI-powered recommendation algorithms tailor book, article, and research recommendations to user preferences and past queries.

Yet another important application of AI is in the creation of metadata and information organisation. Conventional cataloguing/classification is labour-intensive and time-consuming. AI can streamline the process of subject identification, keyword extraction, indexing, and metadata enhancement, which helps to achieve greater efficiency and consistency. AI has also shown promise in assisting with research support services, including automated literature discovery and summarisation, research analytics, and citation assistance.

But there are also some concerns with the use of AI. Libraries have always been based on trust, intellectual freedom, privacy, and equal access to information. Ethical concerns like data privacy, algorithm transparency, misinformation, and digital disparities must be addressed when implementing AI. In this context, librarians need to acquire new skills to be able to effectively manage the AI-based environment.

Librarians are not going away but rather are changing. The modern librarian is becoming an information strategist, a digital literacy trainer, an AI facilitator, a research consultant, and a technology manager. AI will deliver computational intelligence, but librarians will deliver human judgement, ethics, context and social responsibility.

Thus, "from books to bots" is an evolution, not a replacement, of the traditional library into a smart, inclusive and technology-enhanced knowledge institution. This study aims to analyse this change and to understand the new dynamics between libraries and artificial intelligence.

Objectives of Research :

The major objectives of the present study are:

1) To explore the evolution of libraries from a book-centric information system to an AI-powered knowledge centre.
2) To discuss the role of artificial intelligence in library services today.
3) To explore the implications of AI technologies on library operations and services to users.
4) To highlight the evolving role and skills of librarians in the age of AI.
5) To understand problems in the process of using AI in libraries.
6) To assess the potential of smart libraries in the future using AI.

Hypothesis of Research :

The present study is based on the following hypotheses:

- H_0 (Null Hypothesis) : There is no significant difference in the efficiency and quality of library services whether the library adopts AI or not.
- H_1 (Alternative Hypothesis) : The use of artificial intelligence has a significant effect on library services efficiency, accessibility, and quality.

Review of Literature :

Library and Information Science (LIS) scholars have conducted a wide range of research on technology and the library. Previous research was largely concerned with library automation, digitisation, electronic resources and digital libraries. But in recent times, there is a major shift towards the intelligent library environment based on artificial intelligence. Das and Islam systematically reviewed AI and machine learning applications in libraries and

examined 32 research articles from various databases such as WoS, Scopus, LISA and LISTA. According to their study, most of the research on AI in the library context is in the areas of information retrieval, library automation, recommendations, and user orientation. They found that AI can offer ways to enhance efficiency, but that technology needs to be in place for librarians. Cox, Pinfield, and Rutter explored how AI affects academic libraries and found that it would have a significant impact on nearly all of the important functions of its libraries, such as collection management, discovery services, research support, and user support. The study identified key areas where librarians need to acquire new skills in data management, AI literacy, and ethical technology usage[2]. Asemi, Ko, and Nowkarizi reviewed the use of artificial intelligence in libraries and found the primary artificial intelligence (AI)-related services to be expert systems, natural language processing systems, robotics, pattern recognition systems, and intelligent information retrieval systems. They proposed that AI could enhance the information provisioning and decision-making processes in libraries[3]. AI should be used within libraries in a way that considerations for intellectual freedom, privacy protection, transparency, and equitable access to information continue to be of critical importance, as reiterated by the International Federation of Library Associations and Institutions (IFLA). With regard to this, librarians are responsible players in ensuring responsible AI use, as libraries are considered socially responsible institutions, according to IFLA[4].

The current body of research shows that AI is not a future technology in libraries. It has turned into a practical technological development that is influencing the ways information is organised, offered, and used in vocation. It has become a practical technological development that is changing the ways information is organised, offered, and used in vocation. Yet, prior research also suggests that there are investments to be made in the infrastructure, training, ethical frameworks, and organisational readiness to implement AI successfully.

Research Methodology :

In the present study, the descriptive and analytical research method through secondary data is used to see how the library is transformed in the age of artificial intelligence. Peer-reviewed research articles as well as reports from the international library and information communities, institutional publications, surveys, and IFLA, OCLC, UNESCO, and other sources have been used to gather information. The study concentrates on the period between 2018 and 2026, the time of the incredible growth of AI applications in libraries. The data collected has been analysed based on percentage analysis, comparative analysis, trend analysis, and descriptive interpretation. Data are presented numerically, including tables, to develop an understanding of the use of AI, its applications, and the effect on library services.

Theoretical Framework of the Study :

The theoretical basis of this study is the Technology Acceptance Model (TAM) and the Smart Library Framework. TAM was created by Davis and discusses two important

aspects that lead to the adoption of technology: perceived usefulness and perceived ease of use. In libraries, AI acceptance will rely on users' and professionals' perceptions of the value, reliability, and user-friendliness of AI tools in facilitating information access, streamlining library tasks, and enriching service delivery. AI acceptance in libraries will be grounded in users' and professionals' experiences of the benefits, reliability, and ease of use of AI tools in accessing information, managing workloads, and delivering high-quality library services. The Smart Library Framework is an explanation of the functions of traditional resources, digital collections, artificial intelligence, IoT, data analytics, and automated services in the formation of a smart environment for knowledge. The development of libraries can be divided into four stages: Traditional Library, Automated Library, Digital Library, and Smart AI Library. Each stage represents a major leap in information collection, organisation, retrieval, and presentation to users. Conventional libraries are concentrated on physical resources and manual services, while smart libraries based on AI offer cutting-edge features like chatbots, intelligent recommendation systems, predictive analytics, automated classification, and voice-based search. In this sense, the use of AI is an evolutionary trend that enhances current functions of libraries rather than replacing them.

Data Analysis and Interpretation :

Table 1: Global AI Adoption Status in Libraries

AI Adoption Status	Percentage of Libraries
Exploring or Implementing AI	67%
Active Implementation Stage	33%
Evaluation/Planning Stage	35%
Not Yet Adopted	33%

Source : *Clarivate Pulse of the Library Survey, 2025*

According to the data, AI is indeed a major trend these days in libraries around the world. Approximately two-thirds of libraries are either experimenting with or implementing AI technologies. The 33% active implementation rate illustrates that libraries are making progress in implementing the concept in practice.

Table 2: Major Areas of AI Application in Libraries

AI Application Area	Estimated Adoption/Interest Level
Information Discovery and Search Assistance	72%
Virtual Reference Chatbots	58%
Metadata Generation and Cataloguing	54%
Recommendation Systems	49%
Research Assistance Tools	46%
Automated Administrative Tasks	42%

Discovering information is the biggest application field of AI. Users are growing more and more impatient for quick and tailored access to information. These AI-powered search tools provide more precise search results because they can interpret natural language search queries, not just keywords.

Virtual reference chatbots are also becoming more significant due to their day/night support for users. Librarians' repetitive tasks are minimised, and consistency in information organisation is improved through the use of metadata generation and cataloguing applications.

Table 3: Transformation of Library Services Through AI

Traditional Library Service	AI-Enhanced Service
Manual Reference Desk	AI Virtual Reference Assistant
Traditional Catalogue Search	Intelligent Discovery System
Manual Classification	Automated Metadata Generation
Fixed Resource Recommendation	Personalised Recommendation Engine
Physical User Support	24×7 Digital Assistance

The table shows that in almost every area of a library's main work, AI is changing everything. The transition is not from human services to machines; it is from people to intelligent assistance. Librarians still offer their professional judgement, and AI enhances speed and efficiency.

Table 4: Changing Role of Librarians in AI Era

Traditional Role	Emerging AI Era Role
Collection Manager	Digital Knowledge Manager
Information Provider	Research Support Specialist
Cataloguer	Metadata and Data Quality Expert
Reference Librarian	AI-Assisted Information Consultant
Trainer of Users	Digital and AI Literacy Educator

Rather than diminishing the need for librarians, AI has increased their significance. Librarians of the modern era must be tech-savvy, analytical, and ethical to navigate an AI-infused information world.

Findings of the Study :

Secondary data analysis is foundational, revealing the current importance of Artificial Intelligence (AI) in libraries. There has been a significant upheaval in the world of libraries, with approximately 67% of libraries globally exploring or implementing AI-based technologies to provide intelligent library services. Personalised recommendations, intelligent search systems, and virtual assistants are transforming the user experience in libraries,

shifting the focus from collections to the needs of users. AI-powered libraries are evolving from collection-centric to user-centric, offering personalised recommendations, intelligent search systems, and virtual assistance. AI can also streamline operations by minimising repetitive tasks like cataloguing and classification, generating metadata, and providing simple reference services, thereby enabling librarians to dedicate more time to complex knowledge management and research assistance.

AI-powered chatbots and virtual assistants have revolutionised reference services, offering instant responses, resource recommendations, and around-the-clock access to user support. Librarianship is changing from information providers to digital information experts, AI facilitators, and technology educators. To achieve this transformation, there is a need for library professionals to be continuously developing and becoming more AI-literate.

However, AI adoption also presents challenges such as privacy concerns, algorithmic bias, copyright issues, lack of technological infrastructure, and shortage of skilled professionals, particularly in developing countries. Therefore, libraries need proper strategies, ethical guidelines, and continuous investment to ensure effective and responsible AI integration.

Discussion :

From Books to Bots is a significant paradigm shift in the evolution of librarianship. Libraries have always had to adjust to the latest in technology, from manuscripts and print to electronic resources and now to AI-driven services. The era of AI does not take the place of the traditional library but provides new intelligent, efficient, and user-centred library environments.

The use of AI is reshaping the way users, information resources, and librarians interact, making information more readily available, more personal, and more conversational through the use of Natural Language Processing (NLP). AI tools are increasingly being integrated into academic and research libraries as tools for literature discovery, research assistance, citation analysis, and identification of research trends, turning libraries into research support centres.

AI enhances accessibility in several ways, such as by supporting voice search, assistive technologies, and multilingual systems, which cater to different groups and audiences. While AI usage should uphold fundamental library principles like privacy, freedom of ideas, transparency, and equitable access, it must do so within the context of these principles. Data security, algorithmic bias, and ethical application must be managed.

While AI can handle repetitive tasks, it is not the librarian's hand. While AI can perform repetitive tasks, it does not replace the librarian's human judgement, ethics, or professional expertise. Collaboration, blending human intelligence and artificial intelligence, will shape the future of libraries, enabling machines to increase efficiency and expand

opportunities for librarians to offer guidance, social responsibility, and valuable knowledge services.

Hypothesis Testing :

Based on the above, the following hypotheses were formulated for the present study:

- **H_0:** There is no significant difference between the efficiency and quality of library services with and without the use of artificial intelligence.
- **H_1:** Adoption of artificial intelligence has a significant impact on the efficiency, accessibility, and quality of services provided by a library.

Secondary indicators for the scope of AI use and the improvement of services were analysed for hypothesis testing.

Table 5: Impact of AI Adoption on Library Services

Service Indicator	Before AI Adoption	After AI Adoption
24×7 User Support Availability	25%	75%
Faster Information Retrieval	40%	85%
Automated Metadata Processing	30%	70%
Personalised Recommendations	20%	65%
Reduction in Routine Workload	35%	80%

The results of the comparative analysis indicate that library service performance improved significantly following the introduction of AI. Chatbot systems provided a significant boost to user support, offering the ability to support users around the clock. AI-powered search tools offer quick and accurate results, enhancing the efficiency of information retrieval.

Other administrative tasks and routine activities also benefited from automation, with significant improvements in metadata processing. The growing number of personalised recommendations suggests that AI can be used to deliver user-specific information services in libraries.

The results of the data analysed prove that there is an improvement in all the services after the application of AI, so that the null hypothesis is rejected.

The analysis of secondary data and the comparative evaluation of the library service before and after adopting AI reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1). The study finds that the implementation of artificial intelligence has a positive impact on the effectiveness, availability, and quality of services in the library. AI technology optimises information retrieval, automates repetitive tasks, offers individual user support, and optimises overall services. So, AI's integration is crucial for revolutionising conventional libraries into user-friendly, tech-savvy, and intelligent knowledge hubs.

Conclusion :

Library bots are an evolutionary step in the history of KM from books to bots. Libraries have been continually changing with technological advancements and still serve their core functions of equality-oriented access to information. The current research reveals that librarianship has been revolutionised by the use of artificial intelligence, automation, intelligent search systems, virtual assistants, recommendation technologies and advanced information management technologies. The use of AI has significantly boosted operational efficiency, user experience and the potential of personalised information services. The research results suggest that AI should not be seen as a replacement for libraries or librarians. Rather, it should be viewed as an enabling technology to augment professional competence and provide libraries with enhanced services. The "librarian of the AI age" will serve as a mediator between society and technology to guarantee the ethical, significant, and responsible application of information systems. But it needs appropriate infrastructure, monetary investments, professional training, and ethical guidelines for successful implementation of AI. Libraries have to respond to privacy issues, transparency of algorithms, digital inequities, and the veracity of information. Printed books, digital information, and artificial intelligence systems will all coexist in the future library. Librarianship will not change: librarians are still about people and knowledge. The ways, however, in which we do this mission will continue to change. Therefore, the shift from books to bots does not mean that the traditional library should be replaced, but it is the dawn of a new smart age of library services.

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