

The AI-Augmented Librarian: A Qualitative Exploration of Human–AI Collaboration in Library Services

Dr. Ashok Kolambikar

Associate Professor, Dept. of Library & Information science S.S. Suryabhanji Pawar College Purna
(Jn.) Dist. Parbhani

DOI: <https://doi.org/10.51584/IJRIAS.2026.11070064>

Received: 19 July 2026; Accepted: 24 July 2026; Published: 31 July 2026

ABSTRACT

Artificial Intelligence (AI) is transforming library and information services by supporting librarians in delivering smarter, faster, and more efficient services. Technologies such as generative AI, natural language processing, and machine learning assist with reference services, information retrieval, metadata creation, and user support. Rather than replacing librarians, AI complements professional expertise and improves decision-making.

This qualitative study explores human–AI collaboration in library services through semi-structured interviews with library professionals. The findings indicate that AI reduces routine workloads, enhances service efficiency, and enables librarians to focus on user-centered and knowledge-based activities. However, concerns related to information accuracy, privacy, algorithmic bias, and the need for AI literacy remain significant. The study proposes the concept of the AI-Augmented Librarian, emphasizing that effective library services are achieved through collaboration between human expertise and AI. The findings provide valuable guidance for libraries, educators, and policymakers in promoting responsible AI adoption.

Keywords: Artificial Intelligence, AI-Augmented Librarian, Human–AI Collaboration, Library Services, Qualitative Research, AI Literacy, Digital Transformation

INTRODUCTION

Artificial Intelligence (AI) is rapidly transforming the way information is created, organized, accessed, and used across various sectors, including libraries. As libraries continue to evolve from traditional information repositories to digital knowledge centres, AI has emerged as an important technology for enhancing library operations and user services. AI-powered tools are increasingly being used to support information retrieval, reference services, research assistance, content organization, and routine administrative tasks, enabling libraries to deliver faster, more efficient, and user-centred services. The integration of AI is also reshaping the professional role of librarians. Rather than replacing human expertise, AI serves as a collaborative tool that assists librarians in managing information, improving service delivery, and supporting users more effectively. This changing environment requires librarians to develop competencies such as AI literacy, digital skills, critical evaluation of AI-generated information, and an understanding of ethical issues related to privacy, bias, copyright, and transparency.

Against this background, the present study explores how librarians are adopting and using AI in library services and how AI is influencing their professional roles and responsibilities. It examines the opportunities, challenges, and competencies associated with human–AI collaboration while introducing the concept of the AI-Augmented Librarian, which emphasizes the complementary relationship between artificial intelligence and professional expertise. The findings are expected to contribute to the growing body of knowledge on AI in libraries and provide useful insights for library professionals, educators, administrators, and researchers interested in the responsible integration of AI into library services.

LITERATURE REVIEW

Evolution of Artificial Intelligence in Libraries

Artificial Intelligence (AI) has gradually evolved in library services from expert systems to machine learning and generative AI. Initially, AI supported cataloguing, indexing, and reference work. With the growth of digital libraries, its applications expanded to information retrieval, resource organization, and knowledge management [4]. Recent studies indicate that AI is increasingly applied in document classification, recommendation systems, and intelligent search, reflecting its growing role in library operations [3]. Contemporary research also highlights the practical use of AI and its influence on library services and professional practice [12].

AI Applications in Library Services

AI is widely applied in library services to improve the efficiency and quality of information services. Major applications include virtual reference services, chatbots, metadata generation, intelligent information retrieval, and collection management [9]. Machine learning techniques assist in automated metadata creation and improve access to digital resources [11]. AI-based retrieval systems enhance search accuracy by interpreting user queries more effectively than traditional keyword searching [6]. However, the literature emphasizes that librarians continue to play an important role in evaluating and delivering quality information services.

Human–AI Collaboration in Library Services

The literature recognizes AI as a supportive technology that complements librarians' professional work rather than replacing it. AI assists in processing large volumes of information, whereas librarians contribute critical thinking, ethical judgement, and subject expertise [2]. Human-centred AI and augmented intelligence encourage collaboration between librarians and AI systems [7]. Studies also recommend human-in-the-loop approaches to ensure that professional decisions remain under librarian supervision [8].

Changing Role of Librarians in the Age of Artificial Intelligence

The integration of AI has broadened the professional responsibilities of librarians. In addition to managing digital resources, librarians are increasingly involved in research support, data management, information literacy, and AI-assisted services [10]. AI-enabled librarians use intelligent technologies to support information retrieval, metadata creation, and user services while maintaining professional judgement [12]. Research also indicates that AI literacy, critical evaluation, and continuous learning have become essential competencies for modern librarians [1].

Ethical Issues in the Use of Artificial Intelligence in Library Services

The use of AI in libraries has raised important ethical issues related to privacy, copyright, transparency, and fairness. Studies emphasize the need to protect user data and ensure the responsible use of AI technologies. Transparency in AI systems is essential for verifying AI-generated information and maintaining user trust [8]. The literature therefore suggests that ethical principles should guide the implementation of AI in library services.

Research Gap

The review of literature indicates that existing studies mainly focus on AI technologies and their applications in libraries. Limited attention has been given to librarians' experiences of working with AI and the nature of human–AI collaboration in professional practice. Empirical studies examining AI literacy, ethical decision-making, and the changing role of librarians remain insufficient. Therefore, the present study seeks to address these gaps by exploring librarians' experiences and the role of human–AI collaboration in library services.

Research Objectives

The study is guided by the following research objectives:

1. To explore librarians' experiences of using Artificial Intelligence (AI) technologies in library services.
2. To examine the nature and patterns of human–AI collaboration in the delivery of library services.
3. To identify the opportunities, challenges, and ethical issues associated with AI-assisted librarianship.
4. To investigate the competencies and professional skills required for librarians to work effectively with AI technologies.
5. To develop a conceptual understanding of the "AI-Augmented Librarian" based on librarians' experiences and perceptions.

Conceptual Framework of the Study

The conceptual framework of the present study illustrates how Artificial Intelligence (AI) supports librarians in delivering effective and user-centred library services. It assumes that AI functions as an enabling technology rather than a substitute for librarians. The framework emphasizes that meaningful collaboration between librarians and AI systems depends on human expertise, organizational readiness, and ethical implementation.

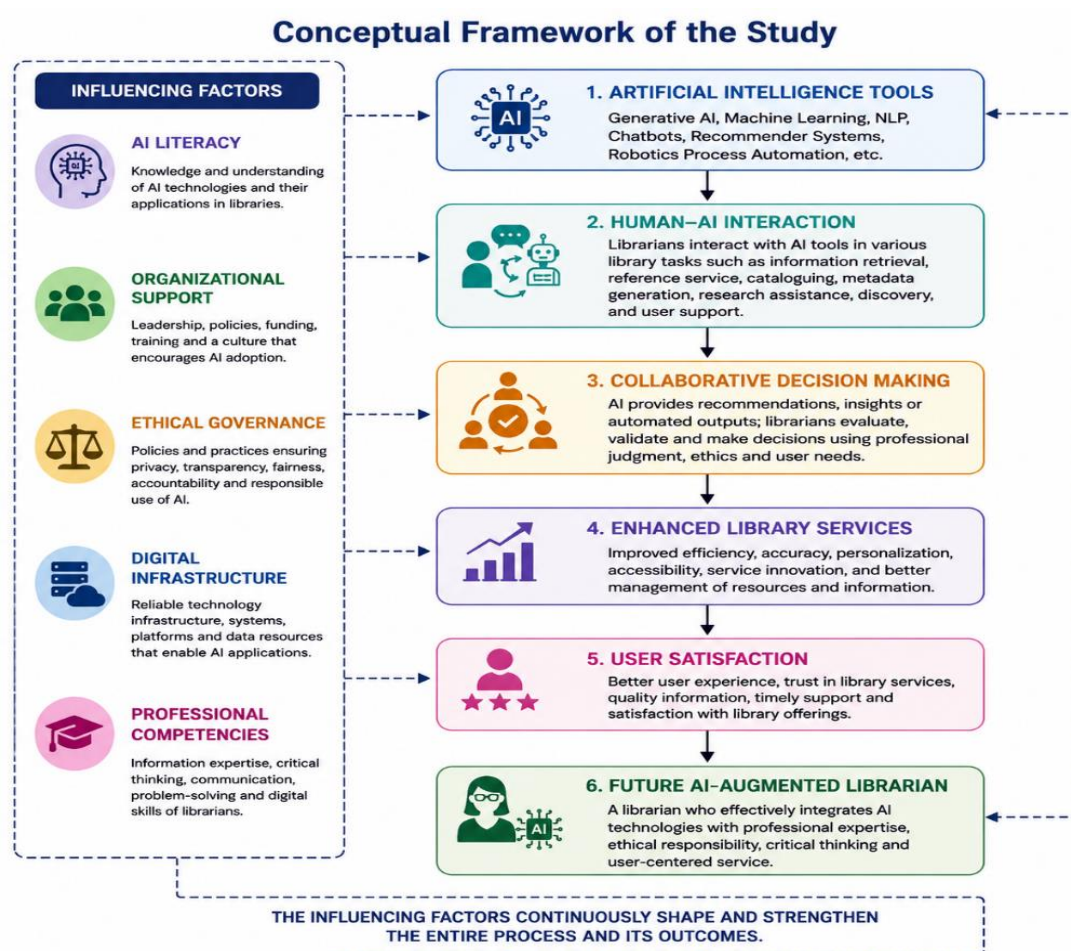


Fig.6.1: Conceptual Framework of the Study

Explanation: The conceptual framework illustrates how Artificial Intelligence (AI) supports librarians in delivering effective library services. The process begins with AI tools, such as chatbots, generative AI, machine learning, and intelligent search systems, which assist librarians in various library activities. These tools enable Human–AI Interaction, where librarians use AI to support tasks such as information retrieval, cataloguing, metadata creation, and research assistance. AI provides suggestions and automates routine work, while librarians apply their professional knowledge and experience. This collaboration leads to Collaborative Decision-Making, where librarians evaluate AI-generated outputs and make the final decisions. As a result, libraries provide

Enhanced Library Services, including faster, more accurate, and user-focused services, which ultimately improve User Satisfaction. The final outcome is the AI-Augmented Librarian—a library professional who combines AI technologies with professional expertise, ethical judgement, and user-centred service to improve library performance. The effectiveness of this process is influenced by AI literacy, professional competencies, organizational support, digital infrastructure, and ethical governance, which together ensure the responsible and effective use of AI in library services.

RESEARCH METHODOLOGY

Research Design

The study employed a qualitative exploratory research design to examine librarians' experiences of using Artificial Intelligence (AI) in library services. An interpretivist approach was adopted to understand participants' views and professional experiences. Data were collected through semi-structured interviews with librarians who had practical experience in using AI tools. The interview data were analysed using thematic analysis by coding and grouping similar responses into themes. Ethical considerations such as informed consent, voluntary participation, confidentiality, and anonymity were observed throughout the study.

Sampling Technique

The study employed purposive sampling to select participants with practical experience in AI-supported library services. A total of 30 professional librarians from different types of libraries were included. Their diverse professional backgrounds and experience with AI provided rich qualitative data relevant to the study objectives.

Data Collection Method

Data were collected through semi-structured interviews using an interview guide developed from the research objectives, literature review, and conceptual framework. A total of 30 professional librarians participated in interviews lasting 30–45 minutes, conducted either face-to-face or online. With participants' consent, the interviews were audio-recorded, transcribed, and analysed. Confidentiality and anonymity were maintained throughout the study.

Data Analysis

The collected interview data were analysed using thematic analysis, which is widely used in qualitative research to identify and interpret patterns in participants' responses. After completing the interviews, the audio recordings were transcribed and reviewed carefully. The transcripts were read several times to gain familiarity with the data. Meaningful statements were assigned initial codes, similar codes were grouped into categories, and broader themes were developed based on the research objectives. The identified themes were interpreted to understand librarians' experiences, patterns of human–AI collaboration, opportunities, challenges, ethical issues, and the emerging concept of the AI-Augmented Librarian.

Table 7.4.1: Steps of Thematic Analysis

Step	Stage of Analysis	Description
1	Data Transcription	Audio-recorded interviews were transcribed into written text to prepare the data for analysis.
2	Data Familiarization	The transcripts were read several times to gain a clear understanding of the participants' experiences and viewpoints.
3	Initial Coding	Meaningful words, phrases, and statements related to the research objectives were identified and assigned initial codes.

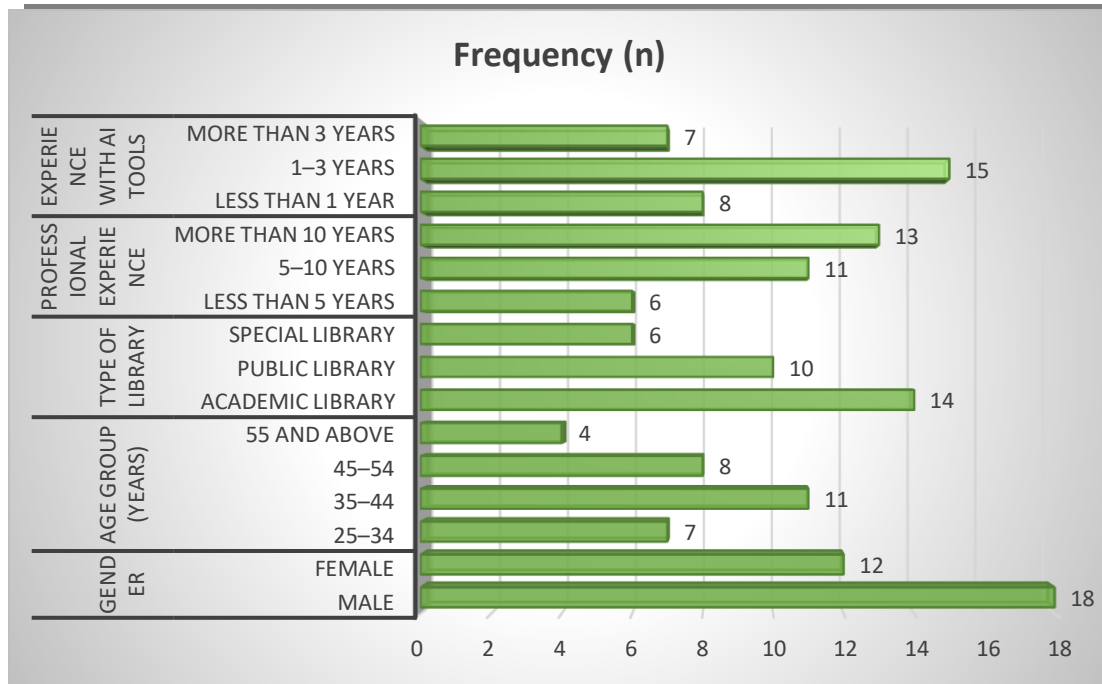
4	Category Development	Similar codes were grouped together to form categories representing common ideas and patterns.
5	Theme Development	Related categories were organized into broader themes and sub-themes that reflected the major findings of the study.
6	Interpretation and Reporting	The themes were interpreted in relation to the research objectives and conceptual framework, and the findings were presented with supporting participant quotations where appropriate.

Source: Developed by the researcher based on Braun and Clarke's (2006) thematic analysis framework.

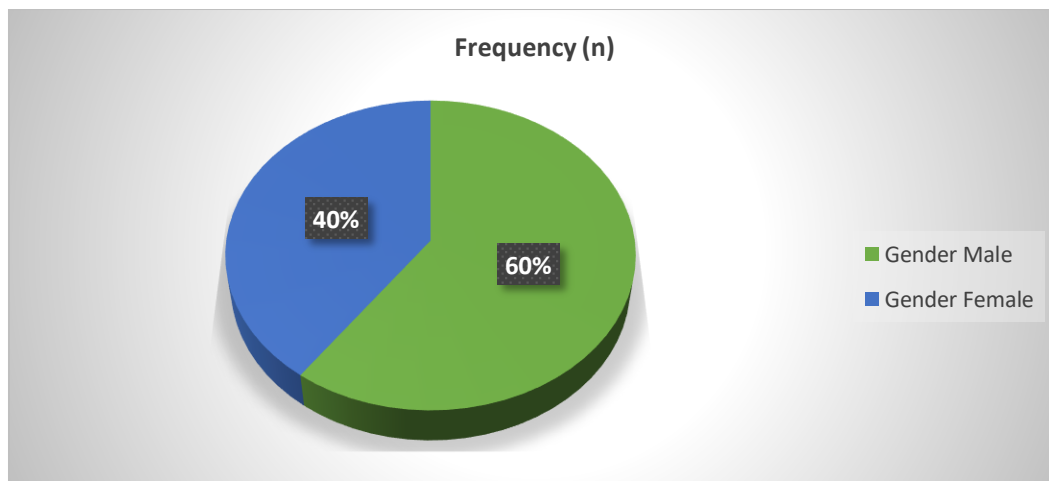
Table 7.4.2: Demographic and Professional Profile of the Participants (n = 30)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	18	60.00
	Female	12	40.00
Age Group (Years)	25–34	7	23.33
	35–44	11	36.67
	45–54	8	26.67
	55 and above	4	13.33
Type of Library	Academic Library	14	46.67
	Public Library	10	33.33
	Special Library	6	20.00
Professional Experience	Less than 5 years	6	20.00
	5–10 years	11	36.67
	More than 10 years	13	43.33
Experience with AI Tools	Less than 1 year	8	26.67
	1–3 years	15	50.00
	More than 3 years	7	23.33

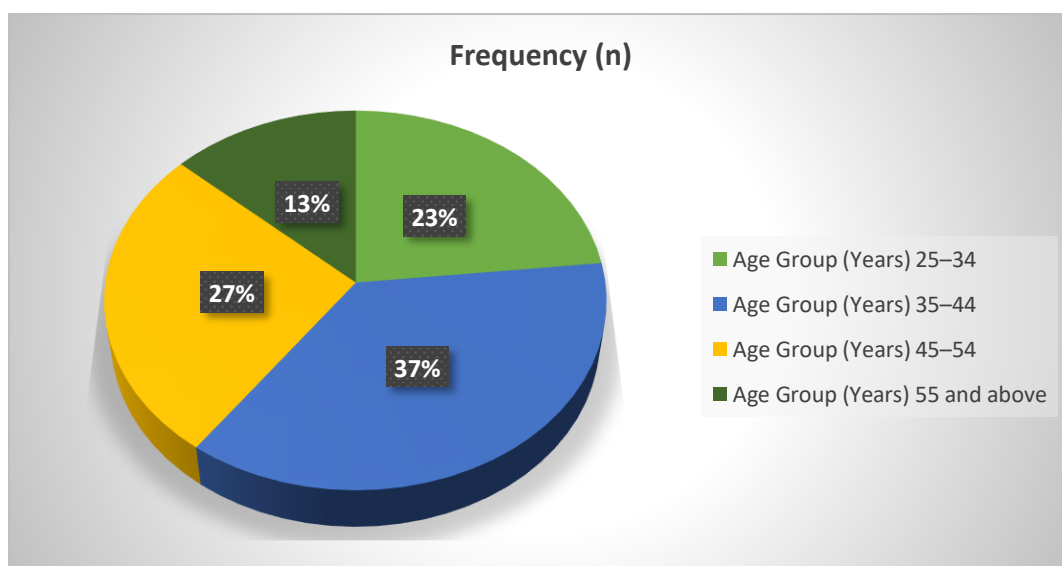
Source: Primary data collected through semi-structured interviews (2026).



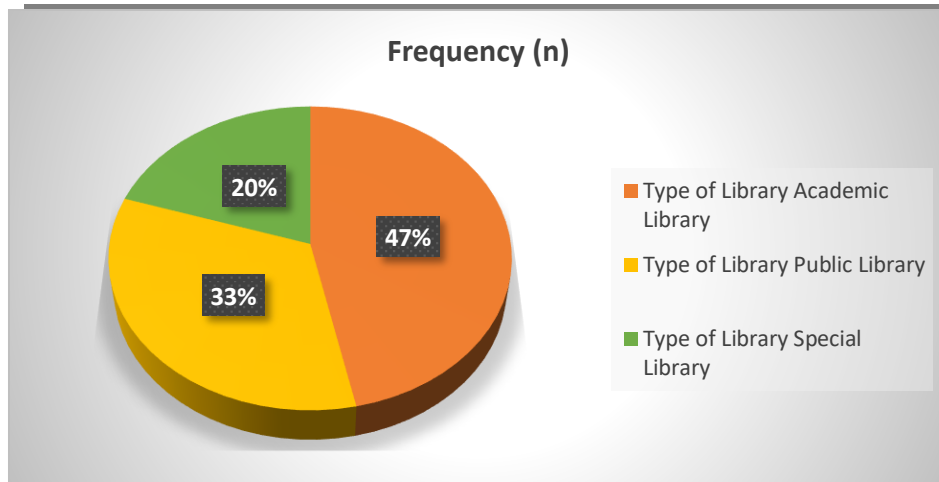
Bar Chart 1 : Distribution of Participants by Demographic and Professional Characteristics (n = 30)



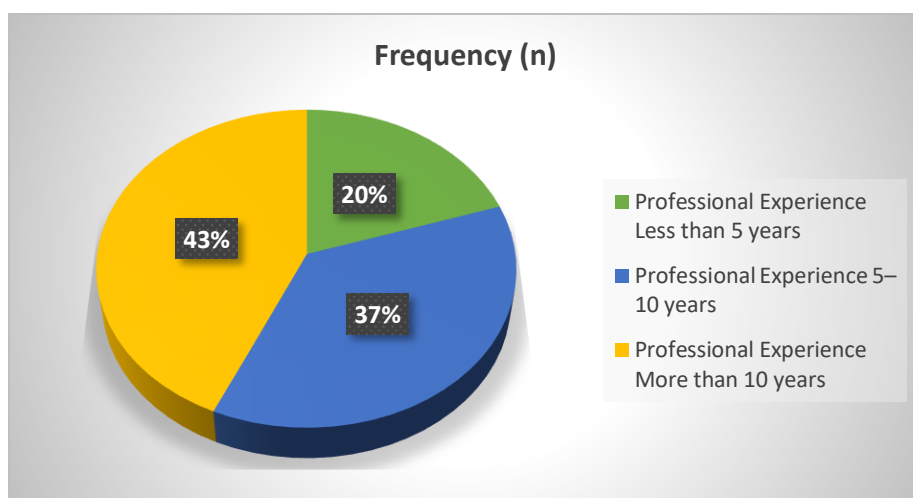
Pie Chart 2: Distribution of AI Tools Used by Participants in Library Services



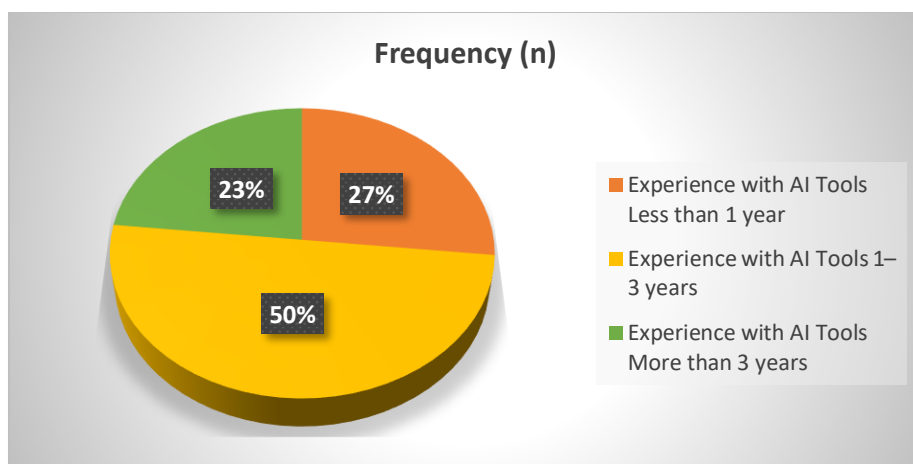
Pie Chart 3: Distribution of AI Tools Used by Participants in Library Services



Pie Chart 4: Distribution of Perceived Benefits of AI in Library Services



Pie Chart 4: Distribution of Challenges Experienced in AI Adoption



Pie Chart 5: of Essential Competencies for AI-Enabled Librarians

Interpretation : Table 7.4.2 , Bar chart 1 and Pie Chart 1to 5 presents the demographic and professional profile of the 30 librarians who participated in the study. Among the participants, 18 (60.00%) were male and 12 (40.00%) were female. Regarding age, the largest group belonged to the 35–44 years category (11; 36.67%), followed by 45–54 years (8; 26.67%), 25–34 years (7; 23.33%), and 55 years and above (4; 13.33%). With respect to the type of library, 14 participants (46.67%) were from academic libraries, 10 (33.33%) from public libraries, and 6 (20.00%) from special libraries. In terms of professional experience, 13 participants (43.33%) had more than 10 years of experience, while 11 (36.67%) had 5–10 years, and 6 (20.00%) had less than 5 years

of experience. Regarding experience with AI tools, 15 participants (50.00%) had been using AI technologies for 1–3 years, 8 (26.67%) had less than one year of experience, and 7 (23.33%) had more than three years of experience. Overall, the participant profile indicates that the study included librarians with diverse demographic backgrounds, professional experience, and varying levels of exposure to AI technologies.

Table 7.4.3: Coding Framework for Thematic Analysis

Illustrative Participant Response	Open Code	Category	Emerging Theme
"AI helps me locate useful information quickly, but I always review the results before assisting users."	AI supports information search	AI-assisted service delivery	Experience with AI Technologies
"AI saves time on repetitive work, allowing me to focus more on users."	Reduced routine workload	Improved work efficiency	Benefits of AI-Assisted Librarianship
"I depend on my professional knowledge to decide whether AI-generated information is reliable."	Human evaluation of AI output	Professional decision-making	Human–AI Collaboration
"Sometimes AI produces incomplete or misleading answers, so verification is necessary."	Need to verify AI responses	Reliability and accuracy	Challenges and Ethical Issues
"Learning to use AI requires continuous training and digital skills."	Continuous AI learning	Professional development	Professional Competencies
"I believe future librarians will work with AI rather than compete with it."	AI as a collaborative partner	Future library practice	AI-Augmented Librarian

Source: Developed by the researcher from the proposed thematic analysis framework.

Interpretation: Table 5.3 illustrates the process used to analyse the interview data. Participants' responses were first examined to identify meaningful ideas, which were recorded as open codes. Similar codes were then grouped into broader categories, and related categories were organized into emerging themes. This process enabled the researcher to systematically interpret librarians' experiences and develop the major themes related to human–AI collaboration in library services.

Table 7.4.4: Major Themes and Sub-themes Identified from the Interviews

Major Theme	Sub-themes
1. Librarians' Experience of Using AI	Familiarity with AI tools, Areas of AI use in library services, Frequency of AI use in daily work
2. Working Together with AI in Library Services	AI as a supporting tool, Human review of AI-generated information, Decision-making by librarians
3. Advantages of Using AI in Libraries	Faster completion of routine work, Better support for library users, Improved access to information and services

4. Challenges in Using AI	Accuracy of AI-generated information, Privacy and copyright concerns, Need for responsible use of AI
5. Skills Required for AI-Enabled Librarianship	AI literacy and digital skills, Critical thinking and evaluation, Continuous professional learning
6. Future Role of Librarians in the AI Era	AI as a partner in library work, Changing professional responsibilities, Future opportunities for library services

Interpretation: Table 7.4.4 presents the major themes and corresponding sub-themes identified from the interview data. The themes describe librarians' experiences with AI, their collaboration with AI in library services, the benefits and challenges of AI adoption, the competencies required for effective AI use, and their perspectives on the future role of librarians. These themes provide the basis for the presentation and discussion of the study findings.

Ethical Consideration

Ethical principles were followed throughout the study. Participation was voluntary, and informed consent was obtained from all participants before conducting the interviews. Participants were assured that their identities would remain confidential and that the information provided would be used only for academic purposes.

FINDINGS AND DISCUSSION

The findings and discussion of the study based on interviews with 30 professional librarians. The interview data were analysed using thematic analysis to understand librarians' experiences of using Artificial Intelligence (AI) in library services. The analysis helped identify common ideas and experiences shared by the participants. The findings are presented under five major themes: Librarians' Experience of Using AI, Working Together with AI in Library Services, Advantages of Using AI in Libraries, Challenges in Using AI, and Skills Required for AI-Enabled Librarianship. Each theme is discussed with support from relevant literature to compare the findings with earlier studies and to explain their significance.

To present the participants' views clearly, selected interview quotations are included using participant codes (P1–P30). These quotations help explain the findings while protecting the identity of the participants. Together, the findings provide an understanding of how librarians are using AI, the opportunities and challenges they experience, and the skills needed to work effectively with AI in library services.

AI Tools and Their Uses in Library Services

Table 8.1.1: AI Tools and Their Uses in Library Services

AI Tool	Purpose of Use
ChatGPT	Reference assistance, content preparation, summarization, drafting responses
Google Gemini	Information searching, content generation, research support
Microsoft Copilot	Writing assistance, document editing, and presentation preparation
Perplexity AI	Literature searching and finding reliable information sources
Grammarly	Grammar checking and improving academic writing

Interpretation: Table 8.1 shows the AI tools used by the participants in different library activities. The participants reported that ChatGPT, Google Gemini, Microsoft Copilot, Perplexity AI, and Grammarly are the AI tools they use most often. These tools are mainly used for searching information, providing reference services,

preparing content, supporting academic writing, conducting literature searches, and improving language quality. Most participants felt that AI helps them complete their work more quickly and efficiently. However, they also stated that AI-generated information should always be checked and verified before it is shared with library users or used for professional work.

Awareness of AI Technologies

Table 8.2.1 : Participants Awareness of Artificial Intelligence in Library Services

The participants showed a good level of awareness of Artificial Intelligence (AI) and its growing use in library services. Most librarians were familiar with AI through professional reading, training programmes, workshops, webinars, and regular use of digital technologies. They recognized AI as a useful tool that can support library work by improving access to information and reducing the time required for routine tasks. Although the level of awareness differed among participants, most agreed that understanding AI has become important for library professionals. They also expressed the need for continuous learning to keep pace with new AI developments and to use these technologies effectively in library services.

Area of Awareness	Summary of Participants' Views
Understanding of AI	Most participants were familiar with the basic concept of Artificial Intelligence and understood its growing importance in library services.
Exposure to AI	Participants became aware of AI through professional development programmes, online learning, webinars, colleagues, and personal exploration.
Familiar AI Tools	ChatGPT, Google Gemini, Microsoft Copilot, Perplexity AI, and Grammarly were the AI tools most frequently mentioned during the interviews.
Usefulness of AI	Participants believed that AI is useful for supporting routine library work, improving information access, and assisting users more effectively.
Learning Needs	Many participants felt that librarians should regularly update their knowledge and skills to use AI confidently and responsibly.

Interpretation: Table 8.2 indicates that the participants had a good level of awareness of Artificial Intelligence and its use in library services. Most librarians had learned about AI through different professional and self-learning opportunities and had already started using AI tools in their work. They considered AI to be a useful support for library services, but also believed that continuous learning is necessary to understand new developments and use AI effectively in professional practice.

Human–AI Collaboration

Table 8.3.1: Forms of Human–AI Collaboration Reported by Participants

Collaboration Area	Role of AI	Role of Librarian
Reference Services	Provides information suggestions	Evaluates and guides users
Research Support	Assists literature exploration	Provides expert interpretation
Content Creation	Generates drafts	Reviews and modifies content
User Services	Supports quick responses	Ensures quality service

Interpretation: Table 8.3 shows that AI and librarians work together to improve library services. AI supports tasks such as providing information, assisting with literature searches, generating content, and responding to user queries. Librarians, however, evaluate AI-generated information, apply professional judgement, edit content, and ensure quality service. The findings indicate that AI enhances librarians' work but does not replace their expertise. The findings strongly reflect the principles of human-centred AI, where technology functions as an enhancement mechanism. The participants did not perceive AI as a replacement for librarians but as a complementary tool that expands professional capabilities.

Challenges Experienced by Librarians

Table 8.4.: Challenges Experienced by Librarians

Challenge	Impact
Lack of training	Limited AI adoption
Accuracy concerns	Need for verification
Ethical issues	Responsible use requirements
Infrastructure barriers	Reduced accessibility

Interpretation: Table 8.4 highlights the key challenges faced by librarians in adopting AI for library services. The findings show that a lack of training limits librarians' ability to use AI tools effectively. Accuracy concerns require librarians to verify AI-generated information before using it in professional work. Participants also identified ethical issues, including privacy, copyright, and bias, emphasizing the need for responsible AI use. In addition, infrastructure barriers, such as limited technological resources and institutional support, reduce the effective implementation of AI in libraries. Overall, addressing these challenges is essential for the successful and responsible adoption of AI in library services.

Essential Competencies for AI-Enabled Librarians

Table 8.5.1: Essential Competencies for AI-Enabled Librarians

Competency Area	Required Skills
Technical	AI literacy, digital skills
Professional	Evaluation, communication
Ethical	Responsible AI use
Learning	Continuous development

Interpretation: Table 6.5 highlights the skills librarians need to use AI effectively in their daily work. Participants emphasized the importance of having basic AI and digital skills, along with the ability to evaluate information critically and communicate effectively with users. They also stressed the need to use AI responsibly by considering ethical issues such as privacy and accuracy. In addition, continuous learning and regular training were considered essential to keep up with new AI developments and improve professional practice

Proposed Conceptual Model of the AI-Augmented Librarian



Figure 8.6.1: Proposed Model of the AI-Augmented Librarian

The proposed model highlights that AI strengthens rather than replaces the role of librarians. While AI supports routine and information-intensive tasks, librarians contribute critical thinking, ethical judgement, and user-focused expertise. This collaborative approach creates more efficient, innovative, and user-centred library services, reflecting the future direction of the library profession.

DISCUSSION

The findings indicate that the AI-Augmented Librarian represents an emerging model of librarianship in which AI supports, rather than replaces, professional librarians. AI enhances information retrieval, decision-making, and service delivery, while librarians continue to provide professional judgement, ethical oversight, critical evaluation, and user-centred services. The study further reveals that AI is reshaping librarians' roles by enabling more efficient, innovative, and responsive library services. However, successful AI adoption requires AI literacy, continuous training, ethical awareness, and institutional support. The study concludes that effective library services depend on the complementary strengths of AI and human expertise, making collaboration between librarians and AI essential for the future of librarianship.

Summary of Findings

The study reveals that librarians are gradually adopting AI technologies to support information services, research activities, content preparation, and administrative tasks. AI helps improve efficiency, productivity, and service

quality by reducing routine workload and supporting faster information access. However, effective AI adoption requires addressing challenges related to accuracy, ethics, training, infrastructure, and institutional support. The findings emphasize that human expertise, professional judgement, and ethical responsibility remain essential in AI-supported library services. The concept of the AI-Augmented Librarian highlights a future model where librarians and AI systems work together, combining technological capabilities with human knowledge to create innovative, responsive, and user-centred library environments.

Future Research Directions

The findings of this study provide several opportunities for further research on the application of Artificial Intelligence in library and information services.

1. Comparative studies on AI adoption in academic, public, and special libraries.
2. Longitudinal studies on the changing roles and competencies of librarians.
3. Mixed-method studies on AI's impact on library services and user satisfaction.
4. Cross-country comparative research on AI implementation in libraries.
5. Evaluation of AI literacy and professional development programmes.
6. Development of ethical governance and AI policy frameworks.
7. Studies on user acceptance and trust in AI-supported library services.
8. Research on emerging AI applications such as chatbots, virtual assistants, recommendation systems, and predictive analytics.

CONCLUSION

The study examined the application of Artificial Intelligence (AI) in library services and its influence on the professional role of librarians. The findings reveal that AI supports information retrieval, research assistance, and user services while improving operational efficiency. However, effective AI implementation depends on librarians' professional expertise, AI literacy, ethical judgement, and institutional support. The study proposes the AI-Augmented Librarian as an emerging professional model in which AI complements human expertise. It concludes that the future of librarianship lies in the effective integration of AI with professional knowledge to deliver efficient, ethical, and user-centred library services.

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