

AI in Libraries: Trends and Future Perspective among Library Professionals in Kamrup, Assam

Namita Bayan

Abstract

Artificial Intelligence has the potential to augment library operations, boost accessibility, and facilitate decision-making. But AI's applicability and utilization around the globe are still in their infancy. This study attempts to investigate trends and perspectives of library professionals from Kamrup, Assam, an area in Northeast India, in light of the recent technological advancements in the field of libraries. The study intends to investigate personnel/staff knowledge, awareness, and opinions on AI and its associated difficulties and potential. Setting dimensions across different library types, ranging from academic to highly research driven organizations, the study uses a quantitative methodology, gathering information from 36 library professionals across a range of library disciplines using a mixture of closed-ended targets, and ending with an open-ended question offering richer insights and firsthand account of AI in libraries.

A number of topics are covered in the study, such as socio demographic data, AI expertise, perspectives and trends about AI in libraries, ethical issues, and implementing AI services and tools. Results show professionals are cognizant of AI and its possible applications in libraries. They think artificial intelligence can help with decision-making, increase accessibility, and improve library activities. AI replacing human intellect in libraries, however, raises certain issues. It is important to consider factors including staff skills, finance, user privacy, and training related to AI deployment. Other important considerations are those of ethics, which include prejudice and discrimination, intellectual freedom, and transparency. Assam libraries are adopting a few current developments, such as virtual assistance, chat bots, voice recognition, image recognition, and OCR technology.

Keywords: Artificial Intelligence, Library technology, Machines, Chat bots, OCR technology, Intelligent libraries, Kamrup Libraries-Assam

1. Introduction

AI in libraries fosters significant development that is drastically altering the services libraries offer and the way they operate. In a digital era, libraries are keeping up with swift advancement of technology. An



innovation that has the potential to totally change library operations is the integration of artificial intelligence (AI) with library technology.

AI integration with library services is becoming more and more popular, with the ability to revolutionize the industry by greatly improving regular library operations and services (Cox, 2022). Information technology automation has gained popularity in libraries; however these systems need a great deal of human contact. Library workers must manually determine a collection's metadata prior to system input while organizing library content, for example, through categorization and cataloging. This procedure necessitates a substantial time investment (Al-Aamri & Osman 2022).

Despite the expanding potential and application of AI in libraries, the trend is still in its early stages. Due to a variety of factors, including facility availability, financial limitations, human resource limits, and policy-related concerns, only a small number of libraries have adopted AI so far (Arlitsch & Newell, 2017).

In this light, the study aims to investigate the knowledge and comprehension of AI and its potential in the future among library professionals and administrators working in Kamrup, Assam.

2. Objectives of the Study

The main objectives of the study are

- ❖ To determine the socio-demographic characteristics of Assam library professionals.
- ❖ To assess the views of library experts on the use of AI and its long-term viability.
- ❖ To examine present patterns and possible applications of AI services and tools in libraries.
- ❖ To assess how Assam library professionals see the effects of AI technology on the resources and services offered by libraries.
- ❖ To share the thoughts and viewpoints of Assam library experts on use of artificial intelligence.

3. Literature Review

The study of artificial intelligence in libraries is not a new one. conducted a systematic review on Google Scholar that clarifies the significance of the phrases "artificial intelligence," "smart libraries," and "library" by showcasing a variety of conceptual papers, empirical research studies, and literature reviews (Harisanty et al., 2023). According to Arlitsch and Newell, (2017) advancements in machine learning techniques, the proliferation of large data, and the increasing capacities of computer processes have all contributed to the advancement of artificial intelligence. This trend has begun to change several industries, including libraries.

As to Chen et al. (2021), the convergence of advancements in AI technology with the field of education has facilitated the creation of intelligent libraries. These libraries create new services by utilizing cutting-edge technologies including RFID, Wi-Fi, BLE, Internet of Things (IoT), deep learning, NLP, recommendation systems, and optical character recognition (OCR). According to Bi et al. (2022) and Gul and Bano (2019)

smart libraries provide new opportunities for interactive service delivery and a flexible approach to boosting user engagement.

But integrating AI into libraries comes with a lot of challenges that need to be carefully considered (Harisanty et al. 2023). Although Talley (2016) highlights the increasing benefits of artificial intelligence (AI) technology and agents in academic libraries, Williams (2019) contends that researchers confront difficulties since AI personal assistants demand advanced search strategies and training. This is the reason why many individuals choose simpler services like Google Scholar.

4. Research Methodology

4.1. Research Design: To accomplish its goals, this study used a quantitative research design that included questionnaires and statistical analyses based on a 5-point Likert scale.

4.2. Sample Selection: A stratified random approach was utilized in the study to choose a broad group of participants from academic, special, public, technical, management, and other research organizations libraries and information.

4.3. Sample Size: 36 actively engaged library professionals, ranging in grade from head librarian to library trainee, made up the sample.

4.4. Survey Tool: A Google Form was used to deploy the survey tool. Agreement was created digitally by requesting the targeted professionals connected to the library/resource domain using social media sites including Facebook, LinkedIn, and Whatsapp Community.

The distribution was intended to guarantee that ethical standards and procedures would not be broken, that all responses would be kept private, and that it would only be used for research.

4.5 Survey Questionnaire

Six parts were plotted using a dichotomous and a 5-point Likert scale, and one open-ended question concluding the survey.

- ❖ Section 1: **Socio-demographic** (5 questions): Information on respondents' demographics was requested.
- ❖ Section 2: **Basic Understanding of AI** (10 questions): This section questioned respondents on the basics of AI.
- ❖ Section 3: **Self-assessment of technological skills in AI** (10 questions): Using a five-point Likert scale ranging from "Very Poor" to "Excellent," respondents' technical abilities in the usage of AI were evaluated.

- ❖ Section 4: **Current AI applications** (1 question, 10 options): Respondents were asked to choose several AI tools and apps that they currently use at their workstations.
- ❖ Section 5: **Future Perspective on AI in Libraries** (10 questions): Using a five-point Likert scale, which goes from “To a Great Extent” to “Not at All,” respondents were asked to express their opinions on AI’s future perspective.
- ❖ Section 6: respondents were invited to express any **open opinions** they may have had on the application of AI in libraries.

4.6. Analysis and Interpretation of Composed Data

The gathered information was carefully examined statistically, including basic percentage and Likert computations, in order to identify trends and offer measurable conclusions.

A five-point Likert scale was used in Sections 3 and 5 of the questionnaire, respondents were asked to rank each item in relation to the five categories, which ranged from “Very Poor” to “Excellent” and “To a Great Extent” to “Not at All,” lastly ending with an open question.

5. Findings of the Study

Following are the conclusions drawn from primary data collected by questionnaire admittance and examined in accordance with subjects covered at the outset of the survey.

5.1. Socio-Demographic Details

Table-1 illustrating socio-demographic information, with findings highlighted below. The study covered 50% of female participants and 50% of male participants. The majority held roles as college librarians, (47%). Universities (14%) and colleges (47%) were the two most prevalent types of institutions. With regard to experience, (61%) of the group had less than 1-5 years under their belt, while (22%) had 20-25 years of experience. These results point to a diverse group of participants with a range of experiences and degrees of library-related competence.

Table 1: Characteristics of the participants

DEMOGRAPHIC DETAILS			
	STATEMENTS	RESPONDENTS	BAR GRAPH
GENDER	Female	17	50%
	Male	17	50%
DESIGNATION	Chief Librarian	0	0%
	Librarian	17	47%
	Documentation	0	0%
	Deputy Librarian	0	0%

LIBRARIES IN AI ERA: APPLICATIONS AND PERSPECTIVES

	Information Scientist	0	0%
	Professor	0	0%
	Associate Professor	0	0%
	Assistant Professor	3	8%
	Assistant Librarian	4	11%
	Library Professional	5	14%
	Library Assistant	1	3%
	Library Attendant	0	0%
	Others	6	17%
INSTITUTE	School	7	19%
	College	17	47%
	University	5	14%
	Technical Institute	1	3%
	Medical Institute	1	3%
	Research Institute	0	0%
	Community Centre	0	0%
	Others	5	14%
RESIDENTIAL AREA	Rural	7	19%
	Urban	18	50%
	Semi-Urban	11	31%
WORKING EXPERIENCE	Less than 1 to 5 years	22	61%
	5-10 years	8	22%
	15-20 years	4	11%
	20-25 years	2	6%
	More than 25 years	0	0%

5.2 Basic Understanding of AI

Table 2: Basic Understanding of AI

Views on A.I in Libraries from Library Professionals	Yes (%)	No (%)
Awareness of Artificial Intelligence in libraries	56%	44%
Usability of AI in libraries	14%	86%
Open to receive training on AI at workplace	78%	22%
Library services to incorporate AI	81%	19%
AI improving and expanding library's services	97%	3%

AI IN LIBRARIES: TRENDS AND FUTURE PERSPECTIVE AMONG LIBRARY PROFESSIONALS IN KAMRUP, ASSAM

AI's assistance in carrying out difficult tasks	89%	11%
AI improving accessibility of library services	94%	6%
AI understanding and serving needs of user	81%	19%
AI taking the role of humans in libraries	22%	78%
Employment threats from artificial intelligence	50%	50%

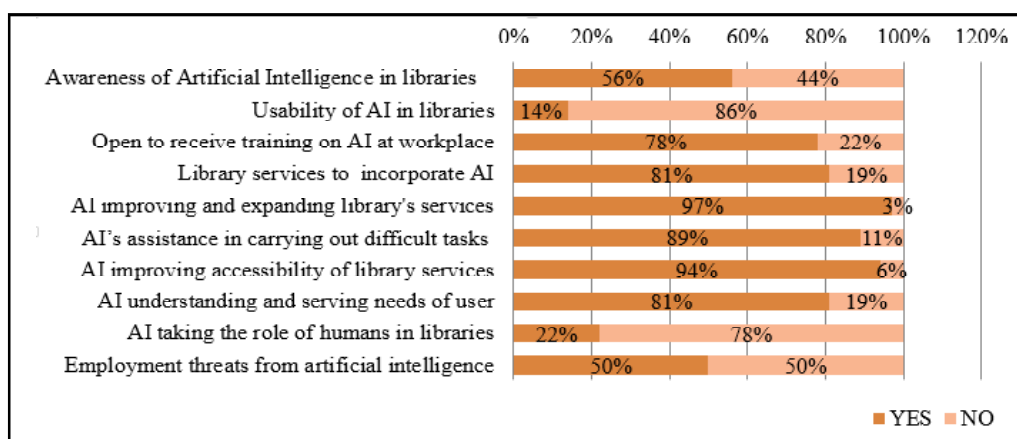


Figure 1: Library Professionals Views on AI in libraries

Table 2 with graphical presentation shows that, although just (14%) of library professionals see AI used in libraries, 56% of library professionals are aware of its existence. The majority support their readiness to be trained in its usage (78%), the incorporation of AI into library services (81%), the prospect of AI expanding services (97%) and completing challenging tasks (89%) while enhancing library services (94%). Additionally, 81% of them think AI can assist user needs. While 22% of respondents think AI won't replace library workers, 50% think it's essential, indicating a potential danger to jobs.

5.3 Self-assessment of technological skills in AI

Table 3: Self-assessment of technological skills in AI

Proficiency in Artificial Technologies and Their Applications in Libraries among Library Professionals	Very Poor	Below Average	Average	Above Average	Excellent
Ability to interpret visual data showcased through computer vision	3	3	24	4	2
Skills of Deep Learning and Machine Learning	3	10	16	4	3
Proficiency in data management and analytics	1	7	21	5	2
Communication and Collaborative skills	1	4	24	4	3
Proficiency of Programming languages like: Python, Java, R, C++	8	8	17	3	0
Understanding of Natural Language Processing (NLP)	7	8	17	4	0
Problem Solving Ability: Meeting Real-World Obstacles	2	6	23	3	2
Understanding of AI Ethics	4	6	17	4	5
Research abilities and Information literacy	2	5	18	7	4
Decoding AI Testing: Adaptability, Autonomy, and Flexibility	3	11	17	3	2

NOTE: Likert Score= Total Score/No. of respondents × No. of Attributes

For example: =3/36×5

=3/180

=0.016

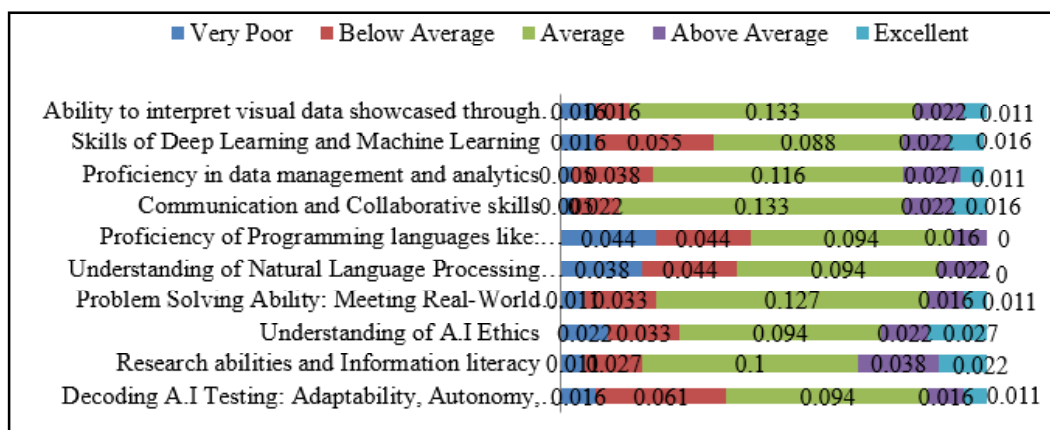


Figure 2: Proficiency and Application of Artificial Technology in Libraries

Table 3, along with graphical presentation, offers a skill-based study of the impact of AI deployment in Kamrup, Assam libraries using a Likert scale. Analysis ranges from Very Poor (1) to Excellent (5). Noteworthy is the average score of 0.133 for communication and collaboration abilities, (0.127) for problem solving ability, and (0.1) for information literacy and research skills, as well as the capacity to comprehend visual data. On the other hand, knowledge in NLP and programming, deep learning and machine learning, deciphering AI testing, and adaptability had limited and negligible impact. Aforementioned analysis highlights the critical importance of visual data interpretation, communication, problem-solving, and research abilities in achieving successful AI integration inside library environments.

5.4. Current AI applications

Table 4: Use of AI based library productivity tools Responses (188) Percentage (N=36)

Virtual Assistants & Chat bots	30	16%
Optical Character Recognition (OCR)	28	15%
Speech Recognition	21	11%
Image Recognition	24	13%
Intelligent Shelves	16	9%
Language Models	14	7%
Robotic Process Automation (RDA)	11	6%
Personal Digital Assistance (PDA)	17	9%
Knowledge Graphs	15	8%
Floor Cleaning Bots	12	6%

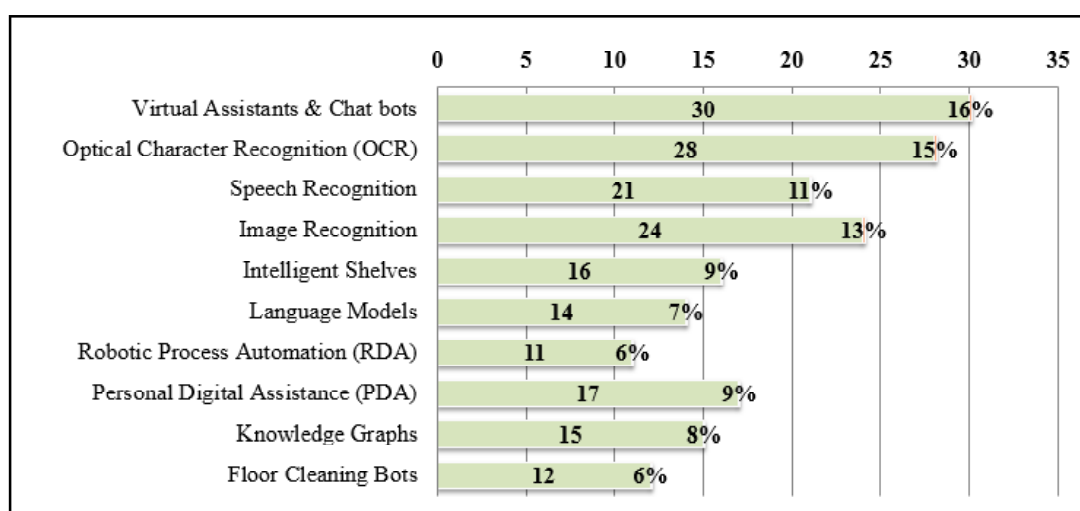


Figure 3: Use of AI based Library productivity tools

Table 4 presents an overview of A.I. tools and services currently being offered in libraries of Kamrup, Assam. The respondents stated that a range of technologies and services must be used to establish smart services. Technologies that respondents use most frequently are chatbots and virtual assistance. Speech, picture, and PDA recognition come next, along with intelligent shelves that use RFID and other tracking technologies to automatically track and pinpoint the movement of library materials. Among other technologies, respondents stated less usage of RPA, Knowledge Graphs, and Cleaning Bots.

5.5 Future Perspective on AI in Libraries

Table 5: Future Perspectives on AI in Libraries

Future perspective of Library professionals on AI assisting Library Services	To a Great Extent	Some what	Little	Very Little	Not at All
AI's search enhance capacity	18	15	3	0	0
AI's aid in decision making	10	14	6	3	3
AI's generating new discoveries and tackling problems	11	13	9	1	3
User experience improvement by AI	10	20	4	1	1
AI's improving cataloguing and classification work	12	19	4	0	1
AI tools improving indexing and quality of research	14	14	7	1	0
AI's assistance & cost-reduction, collection analysis, and digital preservation	13	15	7	1	0
AI driven tools and services protecting core library values	11	15	7	2	1
AI posing Employment threat	12	11	11	1	1
Integration of A.I technologies supporting NEP 2020 goals	11	16	6	3	0

NOTE: Likert Score= Total Score/No. of respondents × No. of Attributes

For example: =18/36×5

$$=18/180$$

$$=0.1$$

Table-5 with graphical presentation outlines perspective on AI's support for libraries rated from 'To a Great Extent' (1) to 'Not at All' (5) in a 5 point Likert scale. Broad consensus regarding AI's potential to improve search (score = 0.1), content indexing (score = 0.077), support for collection analysis and digital preservation (score = 0.072), enhance technical works (score = 0.066), having ability to solve issues and safeguard core library value (score = 0.061). In addition, the respondents believe that AI. would greatly enhance a number of library tasks, such as decision support, user interaction, and its integration with NEP 2020 in order to meet educational objectives in the context of Indian libraries. The danger to employability posed by the use of AI was likewise highly assessed by the respondents, but not significantly.

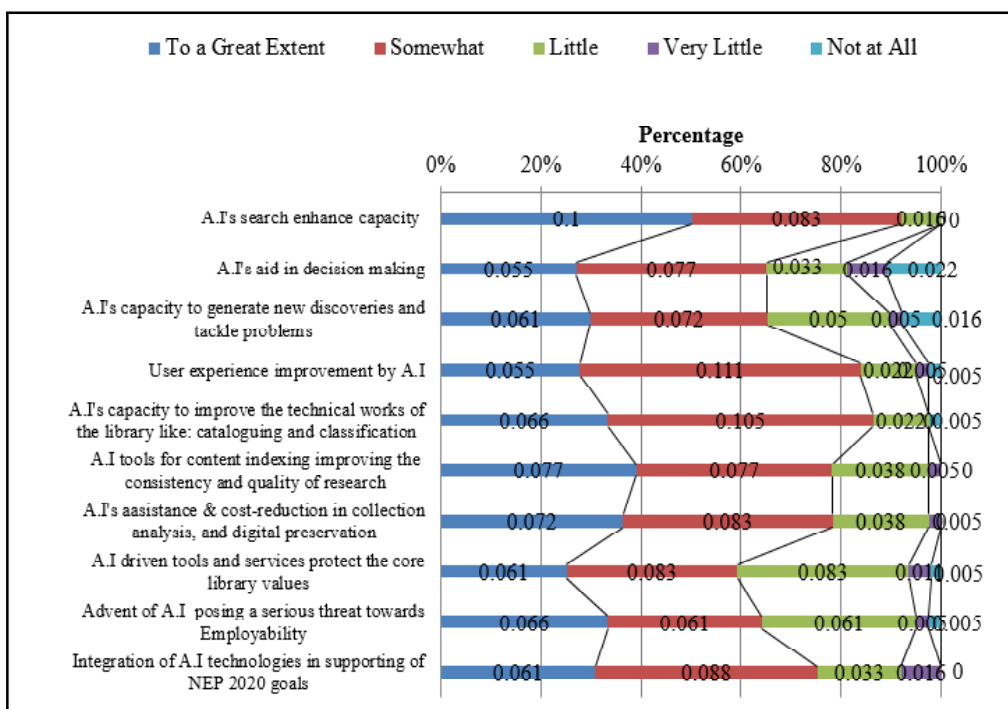


Figure 4: Future perspectives of Library professionals on AI assisting Library Services

5.6. Open opinions on AI

The survey aimed at providing applicants the opportunity to freely and informally respond in free-text about their initial experiences with the use of AI and their future expectations in libraries of Kamrup, Assam. With open-ended questions, one may more easily record different points of views and find hidden attributes that closed questions may go unnoticed.

Table 6 below outlines some of the benefits and drawbacks as reported by library professionals. Positively, according to (13.89%) of respondents, AI devices in libraries would improve user experiences, expedite workflows, and help users. (11.11%) of the respondents made comments on the 24/7 availability of services at the appropriate moment and the ease of storing that robotic storage would provide. (8.33%) perceive AI facilitating automated SDI and reference services, as well as fostering a sense of learning and knowledge.

(5.56%) of participants said AI will make the library less boring since it would seem to be a very helpful atmosphere. Furthermore, as reported, AI would perform regular tasks like classification and cataloging quicker.

However, highlighting the drawbacks, (17%) of the respondents expressed their concern about the “human touch,” saying that while they welcome AI, it would lack and sustain significant consequences since robots cannot replace people. Despite the fact that AI would significantly improve library settings, (11%) of

respondents pointed out there was a lack of training and other support services to make AI easier to use. (8%) are examining the possibility of replacing human employment, igniting a threat over whether AI could soon displace people in their work or create new possibilities. (6%) percent of the respondents raised views about user privacy, citing the ability of machines to decode personal data that may be misused for illicit purposes.

Table 6: Library professionals' Open views on AI perspective and its Sustainability in Future

Attributes	Responses	Percentage (%)
ADVANTAGES		
User Friendly	5	13.89%
Collaborative Knowledge Sharing	3	8.33%
Bridge in Time and Space	4	11.11%
Reduced Boredom	2	5.56%
Improved Routine Operation	2	5.56%
Automated Reference Service	3	8.33%
Faster work Access	2	5.56%
Total	21	58.33%
DISADVANTAGES		
Lack of Human Touch	6	17%
Skeptical User Privacy	2	6%
Lack of Training	4	11%
Employment Threat	3	8%
Total	15	42%
Grand Total	36	100%

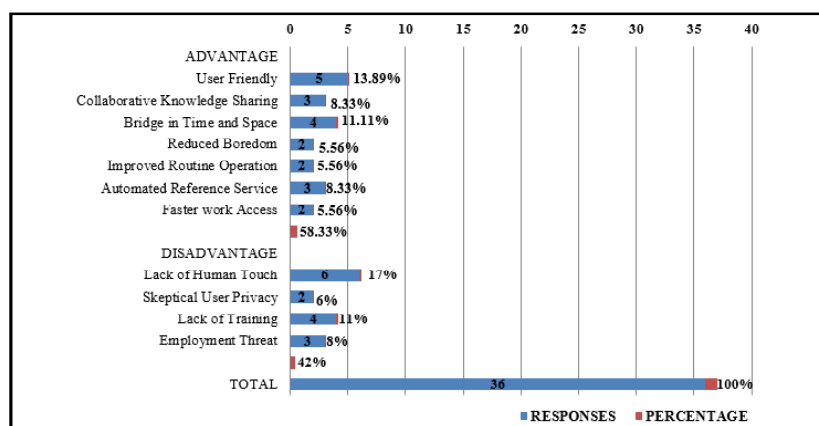


Figure 5: Open views on AI perspective and its Sustainability in Future

6. Discussion

Table 1: presents professional characteristics with a 50/50 split between male and female professionals employed in various institutions around the area. Majority were College librarians.

Table 2: presents an overview of the perspective where respondents indicated AI technologies being used in library operations in limited context, and believed that it could not replace human intelligence despite AI integration if it prevails in future.

Table 3: provides a summary of the capabilities and possible applications of AI in libraries. According to respondents, AI will boost decision-making, user experience, search capabilities, and accessibility to improve access and discovery and boost productivity. In order to successfully integrate AI, there are some restrictions and worries about the usability of visual data interpretation, communication, problem solving, and research skills.

Table 4: provides a summary of AI services and technologies that are currently being used. Responders cast their votes for Virtual help and chatbots that had the highest poll percentage of (16%), followed by OCR (15%), image recognition (13%), and speech recognition (11%). Other technologies like language models, RDA, PDA, graphs, intelligent shelves, and so on were not as well-implemented by the respondents in their libraries.

Table 5: summarizes how library professionals see AI supporting library services in the future. Respondents thought that, if AI were to be implemented gradually in the context of library services, a number of crucial issues would need to be taken into account when examining the sustainability of AI in the future. In order to accomplish educational objectives in the setting of Indian libraries, respondents felt that AI will significantly improve a variety of library functions, including decision assistance, user engagement, and its connection with NEP 2020. However, a small significant danger to employment was predicted.

Table 6: highlights open futuristic views regarding AI implementation in libraries. Participants were found to be split, expressing both positive and conflicting opinions on AI.

7. Limitations of the Study

Few limitations must be acknowledged, despite the study's best effort to provide an exploratory understanding of the attitudes and preparedness of library professionals in Kamrup, 36 samples were collected and recorded favorably in this regard, despite having an intention to focus on 50 professionals from various institutions through online mode. A more thorough grasp of AI perceptions and demonstration of their necessity and demand in the modern era could be obtained by expanding the survey to include on-site responses from respondents.

The focus of the research was a limited geographic area, which might have limited the findings' applicability to libraries in other regions. National cooperation or comparative research conducted in different areas may provide a wider viewpoint.

8. Future Research Avenues

Undertaking ongoing studies to track attitudes and adoption of the technology in libraries over time may yield a more dynamic picture of AI's integration and the evolving perspectives of library professionals.

Qualitative methods such as in-depth interviews, case studies etc. can be used in conjunction with quantitative methods to uncover more complex perspectives and give light on the challenges and achievements of integrating AI into libraries. Analyzing the genuine effect of AI services and tools on user experiences, resource consumption, and library operations would provide factual information to support user perceptions of benefits and ease concerns. Practitioners can effectively negotiate moral quandaries via creating extensive ethical frameworks specifically for AI use within library services.

9. Conclusion

Based on the survey's findings, it is clear that while Kamrup, Assam library professionals are aware of AI technology, they may not be fully aware of how libraries may employ them. Majority of library professionals are employed by colleges, universities, and other public and private institutions as librarians or assistant librarians.

Despite a small sample size, finding shows that the professionals are mature enough to comprehend and use some emerging technology, such as AI. Results show that while these technologies are not widely used in the area, professionals are willing to learn about their application to enhance the effectiveness, accessibility, and openness to library services.

Additionally, many responders agree that AI cannot take the position of human intellect in libraries.

The survey demonstrates how AI may improve decision-making, user experience, search capabilities, and accessibility to libraries. Regarding the financial ramifications, resource needs, and resource preservation connected with AI adoption, there are conflicting views and worries. Nonetheless, an open-ended question at the end delved deeply into respondents' detailed perspectives and yielded insightful data on the topic. This comprehensive and illustrative data can be used as a starting point for future investigations in the area.

References

1. Al-Aamri, J. H., & Osman, N. E. (2022). The role of artificial intelligence abilities in library services. *The International Arab Journal of Information Technology*, 19(3A), 566–573. doi: 10.34028/iajit/19/3A/16.
2. Arlitsch, K., & Newell, B. (2017). Thriving in the age of accelerations: A brief look at the societal effects of artificial intelligence and the opportunities for libraries. *Journal of Library Administration*, 57(7), 789–798. doi: 10.1080/01930826.2017.1362912.
3. Bi, S., Wang, C., Zhang, J., Huang, W., Wu, B., Gong, Y., & Ni, W. (2022). A survey on artificial intelligence aided internet-of-things technologies in emerging smart libraries. *Sensors*, 22(8), 2991. doi: 10.3390/s22082991.

4. Chen, Z., Zhou, M., & Feng, L. (2021). Analysis of the smart library construction in colleges based big data and artificial intelligence. *Journal of Physics: Conference Series*, 1955(1), 012017. doi: 10.1088/1742-6596/1955/1/012017.
5. Cox, A. (2022). The ethics of AI for information professionals: Eight scenarios. *Journal of the Australian Library and Information Association*, 71(3), 201–214. doi: 10.1080/24750158.2022.2084885.
6. Harisanty, D., Anna, N. E. V., Putri, T. E., Firdaus, A. A., & Noor Azizi, N. A. (2023). Is adopting artificial intelligence in libraries urgency or a buzzword? A systematic literature review. *Journal of Information Science*, 01655515221141034. doi: 10.1177/01655515221141034.
7. Gul, S., & Bano, S. (2019). Smart libraries: An emerging and innovative technological habitat of 21st century. *The Electronic Library*, 37(5), 764–783. doi: 10.1108/EL-02-2019-0052.
8. Talley, N. B. (2016). Imagining the use of intelligent agents and artificial intelligence in academic law libraries. *Law Library Journal*, 108 (3), 383-401.
9. Williams, R. (2019). Artificial intelligence assistants in the library: Siri, Alexa, and beyond. *Online Searcher*, 43(3), 10–14. <https://www.infotoday.com/OnlineSearcher/Articles/Features/Artificial-Intelligence-Assistants-in-the-Library-Siri-Alexa-and-Beyond-131529.html>

About Author

Namita Bayan, Alumna, Assam University (Silchar)

Email: namita.bayan37@gmail.com

ORCID: <https://orcid.org/0009-0009-4505-7581>