DLINE JOURNALS

Journal of Information Organization

Print ISSN 2278 – 6503
Online ISSN 2278 – 6511

JIO 2024; 14 (4)
https://doi.org/10.6025/jio/2024/14/4/182-190

Prospects and Perceptions of Library Science Professionals Towards Artificial Intelligence in University of Agricultural and Horticultural Science Libraries in Karnataka

Shobha Dyamanagoudr
Research Scholar (External Part-Time)
Department of Library and Information Science
Yenepoya (Deemed to be University), Deralakatte, Mangalore
Karnataka-575108
shobha.dya@gmail.com

Gururaj F Duragannavar
Chief Librarian
Surana College
Bangalore
fd.gururaj@gmail.com

Latha
Research Scholar
Akkamahadevi Women's University
Vijayapura
latha.achha@gmail.com

Received: 4 June 2024
Revised: 29 July 2024
Accepted: 2 August 2024

ABSTRACT

This research paper delves into the prospects and perceptions of library science professionals regarding the use of Artificial Intelligence (AI) in the University of Agricultural and Horticultural Science Libraries in Karnataka. The goal is to comprehend the potential use of AI, along with the opportunities and challenges at UAS in Karnataka. The study utilized a stratified random sampling method and a close-ended survey to gather data from five Agricultural Science Universities in Karnataka. The research encompasses socio-demographic information, perspectives, and perceptions regarding AI in UAS libraries, the impact of AI skills implementation, adopting AI tools and services, and ethical considerations in AI utilization. UAS libraries have integrated AI tools like smart shelving, RFID, and OCR technology. AI has the potential to enhance library activities, increase accessibility, and improve decision-making in library services.

Keywords: Artificial Intelligence (AI), LIS Professionals, UAS Library, Chatbot, OCR, QuillBot

1. Introduction

Our current society's first Industrial Revolution emphasized the shift towards in-

formation processing and the development of intelligent systems. It acknowledges the transformative impact of industrialisation and highlights the role of microelectronics and computing technologies. Moreover, it discusses how computers can now emulate various human capabilities and mentions ongoing research to enhance these abilities through hardware and software development to simulate intelligent human behaviour. The research focuses on exploring the impact and utility of artificial intelligence applications in various sectors and libraries, including offices, factories, and homes, which are no exception. This field of study is commonly known as 'Artificial Intelligence'.

The growing demand for smart library applications highlights the integration of advanced technologies to upgrade user experience and operational efficiency. Key features include facial recognition for user identification, RFID for inventory management, indoor navigation for better spatial orientation, reservation systems, self-service printing, and smart lockers. These innovations modernise library services, creating a more user-centric and technologically advanced environment.

Despite the growing adoption of AI in libraries, the trend is still in its early stages, limited by facilities, budget constraints, human resources, and policy issues. This study aims to understand UAS Library Professionals' (LIS) perspectives on AI applications in their libraries.

2. About Artificial Intelligence

Artificial Intelligence (AI) considers the first developments before 1950, when the first commercial computers were introduced. In the post-1950 developments, AI was officially launched as a separate field of computer science. Then AI is the science and engineering of making intelligent machines, especially intelligent computer programs. It is Concerned with the study and creation of computer systems that exhibit some form of intelligence: systems that learn new concepts and tasks, systems that can reason and draw useful conclusions about the world around us, systems that can understand a natural language or perceive and comprehend a visual scene, and systems that perform other types of feat that require human types of Intelligence.

It is the Application of Computers and utilization of computer-based products and services in the performance of different library operations and functions or the provision of various services and production of output products. Automation implies a degree of mechanization where the routines and respective jobs or operations are left to be performed by machines with little or no intervention by human beings. The lesser the degree of human intervention, the greater the degree of automation. This does not mean that automation does away with human beings. On the contrary, human beings are relieved of routine chores, which give them more time for tasks that require their intelligence.

2.1. Advantages of Artificial Intelligence

· AI can take on stressful and complex work that humans may struggle/ cannot do.

· AI can complete tasks faster than humans.

· AI discovers unexplored things.

· Less errors and defects.

· Function is infinite.

2.2. Disadvantages of Artificial Intelligence

· High Costs. Creating a machine that can simulate human intelligence is no small feat.

· No Creativity. A big disadvantage of AI is that it cannot learn to think outside the box.

· Unemployment.

· Make Humans Lazy.

· No Ethics.

· Emotionless.

· No Improvement.

3. AI Application of Pattern Recognition in Library Activities

Pattern recognition is a powerful subset of AI that can be incredibly useful in various library activities. Here's how AI-powered pattern recognition can transform library services

3.1 Enhanced Information Retrieval

Image and Text Recognition: AI can recognise text within images, allowing users to search for information in scanned documents, photographs of historical materials, or even agricultural field images containing relevant data.

Content Analysis: AI can analyse the content of various resources like books, articles, and multimedia files, identifying keywords, concepts, and relationships between them. Understanding the context of the information can lead to more relevant search results.

Duplicate Detection: AI can identify and eliminate duplicate entries in the library catalogue, ensuring data accuracy and streamlining search processes.

3.2. Automated Workflows and Improved Efficiency

Self-Service Check-in/Checkout: AI-powered systems with pattern recognition can automate book check-in and checkout processes using barcode or RFID tag recognition.

Missing Item Detection: AI can analyse library shelves using cameras to identify misplaced or missing books, leading to faster retrieval and improved inventory management.

Pattern Recognition in User Behavior: AI can analyse user borrowing patterns to predict future demand for specific resources and optimise collection layout or purchasing decisions.

3.3. Personalized User Experience

Recommendation Systems: AI can analyse a user's borrowing history and browsing patterns to recommend similar resources, catering to their individual interests and research needs.

Content Accessibility Adjustments: AI with pattern recognition can automatically adjust the format of digital resources for users with visual impairments, such as converting text to audio or enlarging fonts.

3.4. Content Creation and Curation

Automatic Captioning of Videos: AI can analyse video content and generate captions, making educational or research videos more accessible to a wider audience, including those with hearing impairments.

Automatic Summarization of Text: AI can analyze lengthy documents and generate summaries, allowing users to quickly grasp the key points of research papers or agricultural reports.

Topic Classification: AI can automatically classify library resources based on content analysis, making it easier for users to browse and locate relevant materials.

3.5. Considerations and Challenges

Data Quality: The accuracy of AI-powered pattern recognition heavily relies on the quality of training data. Libraries must ensure the data used to train AI models is accurate and representative.

Privacy Concerns: When using user data for AI applications, clear data privacy policies and anonymisation practices are crucial to maintaining user trust.

Algorithmic Bias: AI models can inherit biases in the data they are trained on. Libraries need *to be mindful of this and actively work to mitigate bias in their AI systems.*

Overall, AI-powered pattern recognition offers a range of exciting possibilities for enhancing library services. By leveraging these capabilities, UAHS libraries can become more efficient, user-friendly, and intelligent hubs for Karnataka agricultural research and information access.

4. Literature Review

Subaveerapandiyan and Gozali (2024) study of Indian library professionals found that they know AI and believe it improves efficiency, accessibility, and transparency in library services. However, we must consider ethical concerns such as bias, discrimination, intellectual freedom, transparency, and accountability when using AI in libraries. Harisanty et al. (2023) discovered that AI could be easily incorporated into libraries for administrative functions such as staffing, technical functions like cataloging, and informational functions like reference and information literacy. To thoroughly implement AI in libraries, we need to explore the various applications of AI in libraries and its effects on support services. Hussain (2023) Researched the potential and challenges of using AI in library services. Result: AI improves services but faces obstacles like budget and librarian attitudes. Implementing AI may transform libraries and hasten growth. The paper identifies low-cost AI apps for enhancing services. Huang's (2021) article points out that librarians who are well-informed about AI and actively involved in organisational AI-related activities tend to have a more positive opinion of it. However, financial and cost-related issues are often considered the most significant barriers to implementing AI. Bradley's (2022) article delves into the role of libraries in advancing AI regulations. It discusses their contributions to creating ethical frameworks and participating in national AI initiatives. Despite their limited involvement in current and future AI developments, the author believes that libraries have the potential to contribute to AI legislation. Weijia (2022) Several crucial factors affect a library's readiness to implement AI, including leadership priorities, previous experience with AI, willingness to accept AI, understanding of AI, and the overall innovation environment. While AI has the potential to improve library services greatly, barriers like budget limitations, librarian attitudes, and technical skills may hinder its adoption. Williams (2019) conducted a research study that explored the concerns of Nigerian and Pakistani librarians regarding job insecurity and inadequate funding for acquiring AI technologies and hiring librarians with the necessary skills.

5. Objectives

1. Exploring the perspectives of UAS library professionals on using AI in libraries.

2. Assessing the Impact of AI on Library Resources and Services as Perceived by UAS Library Professionals

3. To estimate the AI tools and services currently used by UAS Library professionals in Karnataka.

4. To Recognize the AI tools and services used by UAS Library Professionals in Karnataka

6. Research Methodology

The present study focused on the library professionals from the Five Agricultural Science Universities of Karnataka, which include UAS Bangalore, UAS Dharwad, UAS Raichur, UAHS Shivamogga, and UAHS Bagalkot libraries. The researchers selected the sample of library professionals using the stratified random sampling method, resulting in a final sample of 100 actively participating individuals. Data was collected using Google Forms, with 100 questionnaires sent to users via email and necessary instructions, achieving a response rate of 92%. The data were analysed using MS Excel and IBM-SPSS, a statistical package.

7. Data Analysis

Table 1: Socio-Demographic Details

Socio-demographic details Statements		Respondents	Percentage
Gender	Male	52	56.5%
	Female	40	43.5%
Educational Qualification	Diploma	19	20.6%
	BLIS	5	5.4%
	MLIS	23	25%
	M.Phil.	11	11.9%
	Ph. D.	22	23.9%
	Other (PG diploma, PDF, MSC)	12	13%
Designation	Chief Librarian	5	5.4%
	Deputy Librarian	5	5.4%
	Asst. Librarian	24	26%
	Documentation Officer	18	19.5%
	Library Asst	40	43.4%
University Name	UAS Dharwad	18	19.5%
	UAS Bangalore	19	20.6%
	UAHS Bagalkot	19	20.6%
	UAHS Shivamogga	18	19.5%
	UAS Raichur	17	19.6%
Work Experience	Less than 5 Years	18	19.5%
	5 to 10 Years	23	25%
	10 to 15 Years	13	14.1%
	15 to 20 Years	12	13%
	More than 20 Years	26	28.3%
	Total	**92**	**100%**

Table 1. Socio-Demographic Details

Table 1 reveals that the primary data collected from the questionnaires were analysed with the subject discussed at the beginning of the survey and presented in Table 1. The study involved various participant groups, consisting of 56.5% males and 3.5% females. Participants with a Master of Library and Information Science Qualification accounted for 25% of the group, while those with a Ph.D. qualification made up 23.9%. Additionally, participants were categorised as assistant librarians, deputy librarians, and chief librarians. Most participants had over 20 years of work experience (28.3%), while 25% had 5 to 10 years of experience. The response rate was 20.6% for UAS Bangalore and UAHS Bagalkot, while UAS Raichur, UAHS Shivamogga, and UAS Dharwad had a response rate of 19.5%.

Sl. No.	Perspectives on Library Professionals of AI in UAS Libraries	Yes (%)	No (%)
1	AI has been utilised in libraries	95.6%	4.4%
2	Willingness to undergo training for using AI applications in library services.	89.2%	10.86%
3	AI will be integrated into library services	95.6%	4.4%
4	AI substituting human intelligence in library	88.1%	11.9
5	AI can improve library activities and services	93.4	6.6%
6	AI will not replace librarians but will support them in performing advanced tasks.	92.3%	7.7%
7	AI is an essential technology, libraries cannot neglect	78.2%	21.8%
8	AI has the potential to enhance the accessibility and inclusivity of library services	90.2%	9.8%
9	AI applications in libraries should be transparent, explainable, and accountable.	89.1%	10.9%
10	AI has the potential to help libraries better understand and meet user needs	87%	13%

Table 2. Perspective on AI of UAS Library Professionals'

Table 2 shows that a significant % of library professionals, 95.6%, are integrating AI into library services, emphasizing the widespread use of AI in libraries. 93.4% of professionals use AI to enhance library services, indicating a strong embrace of AI-boosted services. Despite this, only 7.7% favour AI replacing human intelligence. AI is recognised to improve accessibility by 90.2% of respondents, underlining its potential to enhance library services. The desire for training in AI applications is expressed by a majority, at 89.2%, implying an interest in developing skills in this area. Additionally, 87% of professionals acknowledge that AI assists libraries, highlighting its role as a supportive tool in library operations. It is noteworthy that 78.2% of professionals view AI as a crucial technology, indicating the recognition of its significance in the library field. These findings demonstrate library professionals' growing interest in and integration of AI applications.

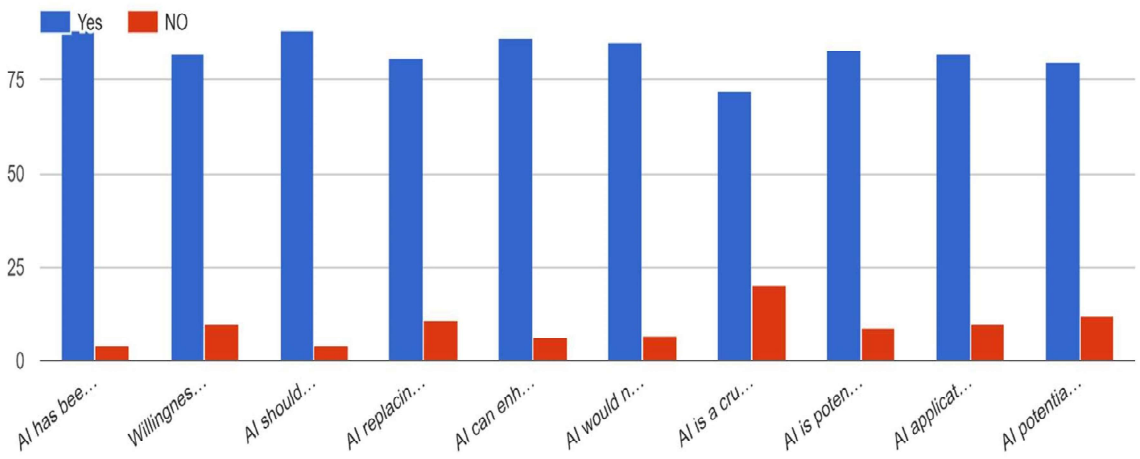

Figure 1. UAS Library Professionals' Perspective on AI

Sl. No	Statements	SA	A	N	DA	SDA
1	AI will be improving search capabilities	38%	60.8%	1%	0	0
2	AI will improve accessibility	22.8%	62%	8.6%	1%	0
3	AI will be improving the user experience	35.8%	55.4%	7.6%	1%	0
4	AI will improve decision-making	19.5%	69.5%	9.7%	1%	0
5	AI will enhance the user experience	30.4%	58.6%	9.7%	1%	0
6	AI increased efficiencies	19.5%	66.3%	10.8%	3%	0
7	AI-enhanced discovery and access	25%	68.4%	5.4%	1%	0
8	AI-enhanced the research	26%	65.2%	6.5%	0	2.1%
9	AI is cost-savings	28.2%	56.5%	14.1%	0	1%
10	Preservation and conservation of resources	26%	66.3%	6.5%	0	1%

(SA-Strongly Agree, A-Agree, N- Neutral, DA- Disagree, SDA-Strongly disagree)

Table 3. AI supports the UAS library activities

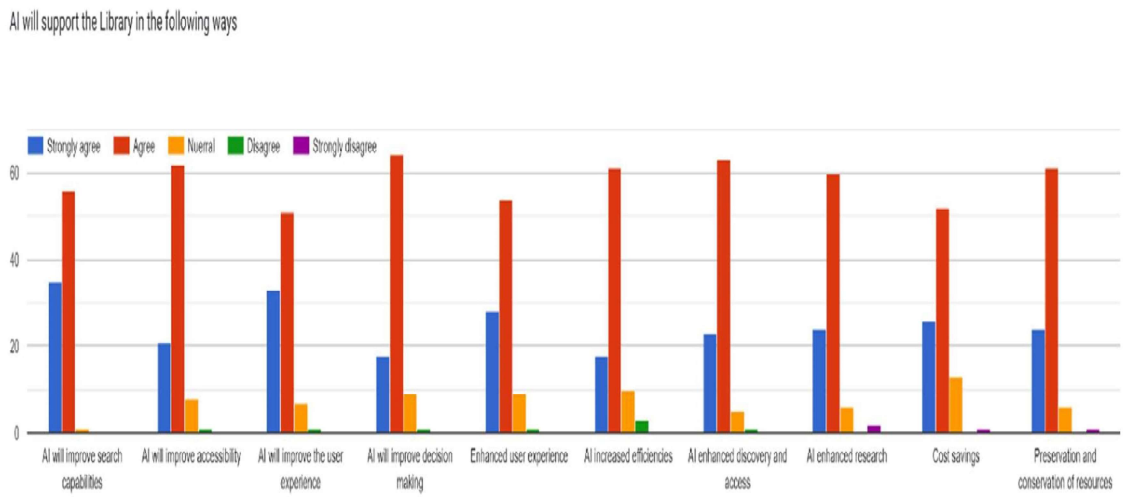

Figure 3. Factors Influencing AI in UAS Libraries

Table 4 indicates the pivotal factors pertinent to the utilization of AI tools and services in libraries across the United States. The expressed percentages signify levels of consensus, denoted by "SA" for Strongly Agree, "A" for Agree, and "N" for Neutral. User privacy: 40.2% (SA), 53.2% (A), 4.3% (N), Funding/cost: 18.4% (SA), 73.9% (A), 7.6% (N), Human Resources: 26% (SA), 59.7% (A), 7.6% (N), Librarian willingness: 29.3% (SA), 60.8% (A), 8.6% (N), Managerial support: 25% (SA), 60.8% (A), 11.9% (N), University backing: 22.8% (SA), 66.3% (A), 9.7% (N), Reliability and maturity of AI applications: 27.1% (SA), 61.9% (A), 8% (N), User acceptance: 18.4% (SA), 71.7% (A), 7.6% (N) 9. Incorporation of library values: 21.7% (SA), 68.4% (A), 8.6% (N) 10. Managerial concerns: 29.3% (SA), 60.8% (A), 6.5% (N). Figure 3 provides a detailed exposition of the data enshrined within Table 4.

Sl. No.	Statements	SA	A	N	DA	SDA
1	Smart shelving	28.2%	64.1%	2.1%	4.3%	1%
2	Optical Character Recognition (OCR)	23.9%	67.3%	4.3%	4.3%	0
3	Chatbots	25%	63%	6.5%	5.4%	0
4	Automatic metadata generation	32.6%	57.6%	4.3%	4.3%	1%
5	Recommendation systems	36.9%	53.2%	5.4%	3.2%	1%
6	Speech recognition	26.9	54.3%	15.2%	4.3%	0
7	Image recognition	28.2%	60.8%	8.6%	2.1%	0
8	Text and data mining	27.1%	63%	6.5%	3.2%	0
9	Natural Language Processing (NLP)	26.9%	64.1%	5.4%	4.3%	0
10	Knowledge graphs	32.6%	50%	11.9%	4.3%	1%

(SA-Strongly Agree, A-Agree, N- Neutral, DA- Disagree, SDA-Strongly disagree)

Table 5. AI tools and services adopted by UAS libraries

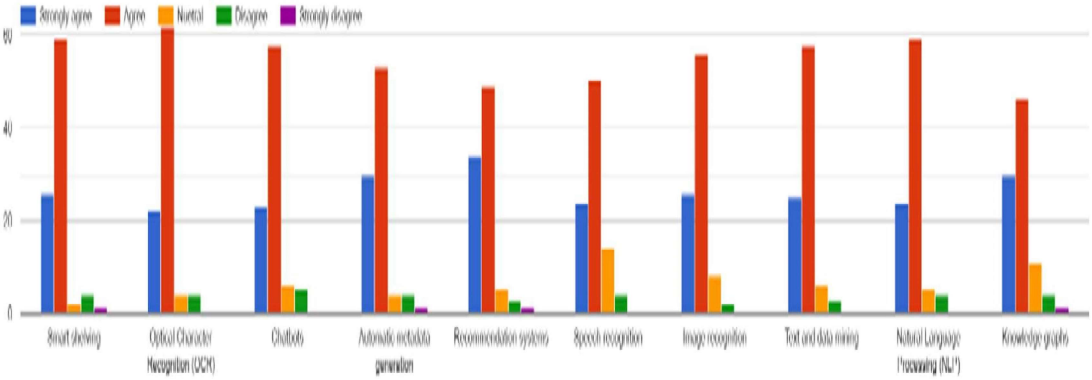

Figure 4. AI tools and services adopted by UAS libraries

Table 5 reveals that the summary of the data on AI tool adoption in UAS libraries: - Smart shelving adoption: 28.2% (SA), 64.1% (A), 2.1% (N), 4.3% (DA), 1% (SDA). - Optical character recognition (OCR) adoption: 23.9% (SA), 67.3% (A), 4.3% (N & DA). - Chatbot adoption: 25% (SA), 63% (A), 6.5% (N), 5.4% (DA). - Automatic metadata generation adoption: 32.6% (SA), 57.6% (A), 4.3% (N and DA). - Systems recommendations adoption: 36.9% (SA), 53.2% (A), 5.4% (N), 3.2% (DA). - Speech recognition adoption: 26.9% (SA), 54.3% (A), 15.2% (N), 4.3% (DA). - Image recognition adoption: 28.2% (SA), 60.8% (A), 8.6% (A), 2.1% (DA). - Data mining adoption: 27.1% (SA), 63% (A), 6.5% (N), 3.2% (DA). - Language Processing adoption: 26.9% (SA), 64.1% (A), 5.4% (N), 4.3% (DA). - Knowledge graphs adoption: 32.6% (SA), 50% (A), 11.9% (N), 4.3% (DA).

8. Conclusion

The article "Prospects Perceptions of LIS Professionals towards AI" discusses the potential benefits of using artificial intelligence (AI) in University of Agricultural Science libraries. Specifically, the article highlights how AI can enhance information retrieval, automate workflows, provide a personalised user experience, and improve content creation and curation. The article presents data on the perspectives of users, librarians, and information professionals on using AI in university libraries, including factors like user privacy, cost, human resources, support from managers and universities, and user acceptance. The article suggests that AI can bring numerous benefits to university libraries. Still, careful consideration must be given to privacy, cost, and user acceptance to ensure successful implementation.

References

[1] Subaveerapandiyan. (2024). *AI in libraries: Prospects and perceptions from library professionals*. *Open Information Science*. https://doi.org/10.1515/opis-2022-0164

[2] 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*. https://doi.org/10.1177/01655515221141034

[3] Hussain, A. (2023). *Use of artificial intelligence in the library services: Prospects and challenges*. *Library Hi Tech News, 40*(2), 15-17.

[4] Bradley, F. (2022). *Representation of libraries in Artificial Intelligence Regulations and Implications for Ethics and Practice*. *Journal of the Australian Library and Information Association, 71*(3), 189-200.

[5] Weijia, G. (2022). *Influencing factors of artificial intelligence readiness in libraries*. *Journal of*

Agricultural Library and Information Science, 34(5), 47-56. https://doi.org/10.13998/j.cnki.issn1002-1248.22-0016

[6] Huang, Y. H. (2022). *Exploring the implementation of Artificial Intelligence Applications among academic libraries in Taiwan*. *Library Hi Tech*. https://doi.org/10.1108/LHT-03-2022-0159

[7] Williams, R. (2019). *Artificial intelligence assistants in the library: Siri, Alexa, and beyond*. *Online Searcher, 43*(3), 10-14.