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Intelligent Libraries: Perception and Proficiency in Artificial Intelligence among Knowledge Custodians

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Abstract:
This research study explored the understanding and views on artificial intelligence (AI) for library specialists in India by gathering responses from a total of 148 randomly chosen respondents. The findings indicate that while these professionals generally have an optimistic attitude towards AI, they also express concerns about AI potentially replacing librarians and the related difficulties for adopting AI tools for various library-related services. The article recommends that awareness about AI can be measured through two newly extracted variables 'AI in Core Library Functions', and 'AI in Library Applications'. Further, to measure the perception of AI among LIS Professionals, again two newly extracted factors can be used namely 'Challenges in Adoption of AI in Library', and 'Impact of AI on Library Personnel'. This study delivers a valuable insight for library fraternity decision makers in designing strategies for AI implementation in academic libraries, and addresses a gap in research related to the AI usage in organizational libraries in developing nations like India.

Keywords: AI in Libraries, Library Professionals, Library AI Skills, Intelligent Libraries, Adoption of AI

Introduction:

Artificial intelligence aims to create machine intelligence that mirrors human capabilities, particularly in tasks such as finding solutions to problems, aiding for making decision, and natural language processing. The development of AI systems is usually for generating new insights from the available data and applying these insights to solving futuristic problems, thereby improving over time. Many predictive errors could be avoided and minimized by employing ML and AI techniques (Ahmed et al., 2023). However, AI has come a long way since its inception but still has several challenges, including confidentiality, safety, and moral issues, hinder its full integration into library and information services. It is crucial for libraries to stay updated on AI advancements and continuously upgrade their technologies (Bubinger and Dinneen, 2021; Huang and Rust, 2018; Lund et al., 2020). ExLibris (2019) supports this by highlighting that machines can process and recognize patterns on a much larger scale and faster than humans, enhancing their ability to perform various tasks independently. AI is already influencing many routine computing tasks, with technologies like natural language processing, robotics, autonomous vehicles, and speech recognition becoming increasingly prevalent in our daily devices. The strength and benefits of AI lie in its ability to recognize patterns at an unprecedented scale, a feat nearly impossible for humans (Madakam et al., 2022).

Libraries have traditionally aimed to provide access to data and wisdom, but the adoption of AI-related technologies has been slower in this sector compared to others. This slow pace has drawn criticism, suggesting that libraries need to modernize and capitalize on the opportunities digital technologies offer. However, digitization poses significant challenges for libraries due to limited budgets, the need to maintain and digitize physical collections, and the varying levels of digital literacy among patrons (Astle and Muir, 2002; Awamleh and Hamad, 2022; Matusiak et al., 2017). Moreover, the traditional focus of librarianship on preservation and access, rather than profit, may also explain the slower adoption of digitalization. Despite these challenges, libraries are increasingly identifying different methods to

provide access to information through electronic innovations. AI-driven automation is revolutionizing libraries and information services by performing routine duties, such as cataloging or data entry, more accurately, thereby making searches more precise and relevant for users. AI technologies, such as chatbots, are also being used to assist patrons in locating materials and answering questions, with AI-ML algorithms providing personalized recommendations based on large data sets. Nonetheless, concerns about privacy, security, and ethics remain significant when it comes to the AI usage for library-related services. AI is constantly evolving, transforming our interaction with technology by developing intelligent systems capable of perceiving, thinking, and behaving like humans (Goralski and Tan, 2020; Hassani et al., 2020; Popenici and Kerr, 2017). Libraries have traditionally been viewed as institutions that promote access to information and knowledge (Subaveerapandiyan et al., 2023).

As AI continues to be integrated into libraries, there will be an increasing demand for data and AI literacy. This shift will require LIS staff to adapt their roles as the context within which they operate evolves with AI integration. For instance, new scientific research methods and the ways they are supported will influence scholarly communication, necessitating that library staff have a concrete consideration of AI and it's tools. Many libraries and information services are already employing AI in various operations (Alam, 2022; Hussain, 2023). Specifically, ML algorithms are being used for tasks such as automatic resource categorization, collection recognition and weeding, cataloging and data input automation, and user-specific recommendations based on search and borrowing histories. AI is also being utilized in the form of voice assistants, virtual assistants, and chatbots in educational institution libraries. As technology advances, the use of AI in library systems has expanded significantly. LIS professionals must ensure that as AI technology becomes more prevalent, it is used responsibly and inclusively, avoiding the perpetuation of biases, discrimination, or disparities. The extensive data managed by libraries allows them to leverage AI for data analysis, but fully implementing AI requires LIS professionals to possess the necessary knowledge, skills, and expertise. Research on AI usage in libraries, particularly in Zambia and the LIS field, is limited. Such studies could reveal how library professionals perceive AI and how it can be adapted for library use, thereby helping library administrators and tech-savvy professionals promote the adoption of AI technologies in libraries.

Literature Review:

Although AI application in libraries is not a new area of study, there has been substantial research on the topic. This analysis draws on a variety of materials, including empirical research, conceptual papers, and literature reviews, sourced from Google Scholar in 2023 using the search terms "artificial intelligence AND library." Additional documents focusing on LIS professionals' knowledge and perceptions of AI were identified through manual screening. Many published conceptual papers discuss AI's role in academic libraries, particularly its potential to enhance service delivery. According to Yusuf et al., AI technologies can drastically grow the effectiveness of library offerings, allowing libraries to provide more dynamic offerings to users. However, the study also highlights challenges in implementing AI in academic libraries across the world, such as unstable power supplies, skills gaps, job displacement, and inadequate infrastructure.

Massis (2018) suggests that while AI could pose a threat to traditional institutions like libraries, it also holds significant potential for improving library services. The author notes that although AI is in its early stages, it could greatly enhance a wide range of library services if fully integrated and accepted. There is a strong argument for incorporating more AI and robotics education into LIS programs to better prepare professionals for the ethical and responsible use of these technologies, which could position the field at the intersection of human information behavior, information ethics, and AI development.

Cox et al. (2018) conducted interviews with 33 library directors, experts, publishers, and commentators to learn more about the potential applications of AI in libraries. Machine- readable collections, information retrieval tools, research development, scholarly communication, and teaching and learning are just a few of the areas they identified where AI could be useful. According to McKie et al. (2022), user interaction and information retrieval are significantly influenced by voice assistants' perceived personalities and human-like traits. Yao et al. (2015) noted that by offering virtual reference services, Xaiotu, an AI-based smart talking robot, may be customized to match the unique requirements of various libraries. Kaushal and Yadav (2022) found that services created for academic communication and research might be significantly improved by merging chatbot technology with current library information systems. In order to administer library services more efficiently, Modiba (2021) suggested utilizing AI technologies, such as automated digitization, classification, and quick record retrieval and disposal. She pointed out that inadequate records administration was caused by the absence of a dependable system. According to Massis (2018), artificial intelligence (AI) has the potential to significantly improve library services even though it is perceived as a threat to established institutions. Mogali (2014) emphasized the potential of artificial intelligence (AI) in fields such as robotics, expert systems, natural language processing, pattern recognition, and especially in jobs like cataloging, classification, and reference services, which might greatly increase library efficiency.

Grbin et al. (2022) emphasize the importance of developing automation solutions with substantial librarian involvement. They argue that librarians' unique skills and knowledge in information organization, data management, and user-centered design are essential for contributing to machine learning initiatives. Harisanty et al. (2022) state that awareness and necessary knowledge for AI implementation in libraries can only be achieved by engaging leaders, practitioners, and scientists in the process. Their study highlights the benefits, practicality, required knowledge and skills, challenges, and availability of AI resources in Indonesian libraries.

Ajani et al. (2022) report differing opinions on whether university libraries can adopt AI technology in their operations

and services. The authors argue that AI integration could improve library functions by reducing human errors in repetitive tasks, but they also reveal librarians' fears of job losses. Wood and Evans (2018) found that most of their participants agreed AI would significantly impact library services over the next three decades, particularly in resource discovery and referencing. Similarly, Honghai (2020) reports that while AI will not replace reference librarians, it can enhance services to meet users' technical expectations. Honghai suggests that AI can analyze vast amounts of data from internal and external repositories to meet users' unique needs and discusses using an AI-based "knowledge assimilation agent" for knowledge generation through machine learning from library materials and user interactions. This could help researchers manage large datasets, keeping libraries relevant in their organizations. However, concerns persist among LIS professionals regarding job erosion, the lack of AI advancements relevant to libraries, and issues related to privacy and data security. Garcia-Febo (2019) argues that libraries must address these concerns by proactively developing policies to ensure AI is used ethically and responsibly. She advocates for strategic investment in AI development, aligned with libraries' mission as knowledge and information stewards.

Research Methodology:

The study has used a descriptive approach, with “Awareness”, “Perception, and “Skills” as the three independent variables, and the dependent variable was “AI Implementations”. The ultimate objective was to evaluate the interlinkages between the “Awareness”, “Perception, and “Skills” among the LIS professionals and the “AI Implementation”. India was chosen as the case study because such an investigation had not been conducted in the country before. The study focused on professionals from library fraternity who are working in a library of various institutions. For primary data collection, Google Forms were circulated as a structured questionnaire to various library personnel. The form contains a total of 45 statements and it was sent to 398, but only 148 participants responded. Responses were measured using a five- point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree." The study began with a review of the literature, including published articles, books, and websites related to the topic, to collect secondary data. The analysis was employed to identify three key themes: “Awareness of AI”, “Perception of AI”, and “AI-related skills” requirement. The data was analyzed using SPSS 23.0 to address the research questions.

Data Analysis and Discussion:

Table 1: “Profile of Respondents”

Gender		Age (In Years)		Qualification		Designation		Institute Type	
Male	109	<=25	4	B.Lib	3	Assistant Librarian	44	Autonomous	27
Female	39	26-35	44	M.Com	4	Dy. Librarian	8	Deemed To be	6
		36-45	58	MA	4	Head Librarian	3	Government	28
		>45	42	M.Lib	81	Librarian	43	Grant-in-Aid	4
				M.Phil	18	Library Assistant	46	Private	83
				Ph.D.	35	Library Clerk	4		

NAAC Accredited	
Yes (89)	No (59)
A++	15
A+	42
A	11
B++	10
B+	7
B	4

The above table shows the details of the demographic profile of the respondents. Out of total 148 respondents, 109 (73.6%) were male and 39 (26.4%) were female respondents. Most (58, 39.2%) of the respondents out of 148 were from the age group of 36-45 years, the next highest is from the age group of 26-35 years (44, 29.7%). The majority (81, 54.7%) of the respondents hold M.Lib. as their highest qualification. The next highest qualification is Ph.D. (35, 23.6%). 46 (31.1%) of the total respondents were having the designation of ‘Library Assistant’, 44 (29.7%) were having ‘Assistant Librarian’, 43 (29.1%) of the respondents were ‘Librarian’, and the remaining 10.1% of the respondents had other designations. Most (83, 56%) of the respondents were from private institutions, 28 (18.9%) were from government institutions, and 27 (18.2%) were from autonomous institutions. A total of 89 (60.1%) institutions where the respondents are working are NAAC accredited. Out of which, 15 (10.1%) are accredited with grade ‘A++’, 42 (28.4%) are accredited with grade ‘A+’, 11 (7.4%) are accredited with grade ‘A’, and remaining (21, 14.2%) institutions are graded with either ‘B++’ or ‘B+’ or‘B’.

Table 2: "Opinions about Awareness of AI among LIS Professionals"

"Awareness of AI among LIS Professionals" (AI is used…)	"SD"	"D"	"N"	"A"	"SA"	"Mean"	"Std. Dev."
in locating personalized resources in libraries	16 (10.8)	8 (5.4)	18 (12.2)	76 (51.4)	30 (20.3)	3.65	1.18
in prediction of trends of keywords of readers' book search	16 (10.8)	22 (14.9)	26 (17.6)	48 (32.4)	36 (24.3)	3.45	1.3
employ chatbots to enhance the support users' queries related library services	12 (8.1)	12 (8.1)	26 (17.6)	54 (36.5)	44 (29.7)	3.72	1.21
to find false information	20 (13.5)	24 (16.2)	51 (34.5)	40 (27.0)	13 (8.8)	3.01	1.15
to locate/discover articles	20 (13.5)	11 (7.4)	20 (13.5)	61 (41.2)	36 (24.3)	3.55	1.31
in OCR and conservancy of documents	12 (8.1)	19 (12.8)	43 (29.1)	53 (35.8)	21 (14.2)	3.35	1.12
in indexing	16 (10.8)	14 (9.5)	32 (21.6)	61 (41.2)	25 (16.9)	3.44	1.2
in clearing obsolete library resources	16 (10.8)	21 (14.2)	48 (32.4)	36 (24.3)	27 (18.2)	3.25	1.22
in inspection of library resources	12 (8.1)	14 (9.5)	43 (29.1)	60 (40.5)	19 (12.8)	3.41	1.09
in the acquisition of library resources	16 (10.8)	23 (15.5)	22 (14.9)	63 (42.6)	24 (16.2)	3.38	1.24
in library MIS	20 (13.5)	21 (14.2)	37 (25.0)	55 (37.2)	15 (10.1)	3.16	1.2
in distribution of library related resources	12 (8.1)	25 (16.9)	37 (25.0)	61 (41.2)	13 (8.8)	3.26	1.1
in library safekeeping and scrutiny	19 (12.8)	14 (9.5)	25 (16.9)	59 (39.9)	51 (20.9)	3.47	1.28
in bibliographies and anthologies	8 (5.4)	18 (12.2)	51 (34.5)	59 (39.9)	12 (8.1)	3.33	0.98
to find references	16 (10.8)	14 (9.5)	33 (22.3)	58 (39.2)	27 (18.2)	3.45	1.21
in management of research related data	16 (10.8)	18 (12.2)	34 (23.0)	56 (37.8)	24 (16.2)	3.37	1.21
in e-resources management	16 (10.8)	14 (9.5)	33 (22.3)	57 (38.5)	28 (18.9)	3.45	1.21
in content summarization	12 (8.1)	19 (12.8)	27 (18.2)	54 (36.5)	36 (24.3)	3.56	1.22
in language transformation	12 (8.1)	12 (8.1)	28 (18.9)	72 (48.6)	24 (16.2)	3.57	1.11
in the writing of systematic literature reviews	8 (5.4)	19 (12.8)	37 (25.0)	55 (37.2)	29 (19.6)	3.53	1.11
in search engines	12 (8.1)	4 (2.7)	44 (29.7)	52 (35.1)	36 (24.3)	3.65	1.12
in library databases	12 (8.1)	8 (5.4)	36 (24.3)	46 (31.1)	46 (31.1)	3.72	1.2
"SD = Strongly Disagree (1), D = Disagree (2), N = Neutral (3), A = Agree (4), SA = Strongly Agree (5)"							

The above table gives an illustration of the opinion of library staff about the 'Awareness of AI'. Most of the users have shown their agreeableness for all the variables related to the usage of AI in various library-related functions/processes. As per the responses of the respondents, they are more sceptical about the usage of AI in the detection of false information as the mean is the lowest 3.01 with a standard deviation of 1.15. Other than this, the respondents believe

more in the capabilities of AI. Particularly they believed AI could potentially be used in core library-related services like referencing, indexing, circulations, library databases, etc. It can also be used in the classification of library resources (Chaoying, 2021). According to library professionals, AI can be extensively used in research-related activities such as discovering articles, finding references, systematic literature reviews, etc. Overall, the respondents were quite inclined towards the positive impact of AI in managing various library-related services.

Table 3: "Summary of Perception of AI among LIS Professionals"

reception of AI among LIS professionals"	"SD"	"D"	"N"	"A"	"SA"	"Mean"	"Std. Dev."
AI robots can fill vacant post of librarians	30 (20.3)	42 (28.4)	34 (23)	33 (22.3)	9 (6.1)	2.66	1.20
AI robots can perform role of librarians more effectively	30 (20.3)	25 (16.9)	37 (25)	43 (29.9)	13 (8.8)	2.89	1.27
AI robots can complement librarians in the future	16 (10.8)	22 (14.9)	30 (20.3)	66 (44.6)	14 (9.5)	3.27	1.15
AI can compensate for performance gaps for librarians	20 (13.5)	11 (7.4)	43 (29.1)	64 (43.2)	10 (6.8)	3.22	1.12
AI makes library personnel more sluggish	37 (25)	25 (16.9)	40 (27)	34 (23)	12 (8.1)	2.72	1.28
Lack of financial support is the issue for the adoption of AI	11 (7.4)	12 (8.1)	52 (35.1)	51 (34.5)	22 (14.9)	3.41	1.07
The lack of expertise among LIS professionals is the cause for not adopting AI in libraries	8 (5.4)	21 (14.2)	54 (36.5)	47 (31.8)	18 (12.2)	3.31	1.03
AI can cut-down librarian's occupation	25 (16.9)	11 (7.4)	40 (27)	52 (35.1)	9 (6.1)	3.20	1.26
The external expertise not available for AI implementation	14 (9.5)	22 (14.9)	69 (46.6)	37 (25)	6 (4.1)	2.99	0.97
More flexibility in terms of innovativeness is the prime concern for implementation	19 (12.8)	19 (12.8)	56 (37.8)	40 (27)	14 (9.5)	3.07	1.13
"SD = Strongly Disagree (1), D = Disagree (2), N = Neutral (3), A = Agree (4), SA = Strongly Agree (5)"							

The above table depicts the outline of viewpoint of library professionals about how AI could potentially impacts their working patterns. The respondents are sceptical about AI robots as their potential replacement in the world of library science. The mean value of the same is 2.66 with a standard deviation of 1.20, which suggests their otherwise thinking. They also thought that AI would not make them lazy as the mean is about 2.72. The library professional considers budgeting as a prime barrier for the implementation of AI in libraries. Largely, a mixed response is received in terms of library professionals considering AI as a potential threat to their regular work as the mean score is near 3.

Table 4: "Summary of AI Skills Required among LIS Professionals"

kills required by Librarians in the AI Era"	"SD"	"D"	"N"	"A"	"SA"	"Mean"	"Std. Dev."
Electronic communication	12 (8.1)	8 (5.4)	12 (8.1)	74 (50)	42 (28.4)	3.85	1.14
Software and Hardware	12 (8.1)	8 (5.4)	29 (19.6)	62 (41.9)	37 (25)	3.70	1.15
Applications of internet	12 (8.1)	4 (2.7)	22 (14.9)	70 (47.3)	40 (27)	3.82	1.11
Programming skills	8 (5.4)	4 (2.7)	37 (25)	72 (48.6)	27 (18.2)	3.71	0.97
Networking	8 (5.4)	12 (8.1)	25 (16.9)	77 (52)	26 (17.6)	3.68	1.03
Cyber security	4 (2.7)	12 (8.1)	45 (30.4)	60 (40.5)	27 (18.2)	3.63	0.96
Data quality control	8 (5.4)	12 (8.1)	37 (25)	54 (36.5)	37 (25)	3.67	1.10

Data curation	12 (8.1)	12 (8.1)	33 (22.3)	55 (37.2)	36 (24.3)	3.62	1.17
DBMS	16 (10.8)	8 (5.4)	18 (12.2)	73 (49.3)	33 (22.3)	3.66	1.19
Designing AI pipelines	20 (13.5)	8 (5.4)	38 (25.7)	64 (43.2)	18 (12.2)	3.35	1.18
Data analytics	24 (16.2)	4 (2.7)	38 (25.7)	65 (43.9)	17 (11.5)	3.31	1.21
Data handling	20 (13.5)	3 (2)	30 (20.3)	62 (41.9)	33 (22.3)	3.57	1.25
Data mining	16 (10.8)	12 (8.1)	25 (16.9)	62 (41.9)	33 (22.3)	3.56	1.23
"SD = Strongly Disagree (1), D = Disagree (2), N = Neutral (3), A = Agree (4), SA = Strongly Agree (5)"							

The above table shows the perception of library professionals about the skills required for them in the era of AI. Usually, both soft skills and technical skills are required to get most of the benefits of the technology.

Considering the technical part of it, most of the respondents believed that 'Electronic Communication' is one of the most required skills for library professionals in the era of AI.

The respondents have rated requirements of having skills related to software and hardware, internet application, programming skills, networking, and database related knowledge, etc., very highly.

Table 5.1: – "KMO and Bartlett's Test"

"Kaiser-Meyer-Olkin Measure of Sampling Adequacy."		.873
"Bartlett's Test of Sphericity"	Approx. Chi-Square	5108.193
	df	231
	Sig.	.000

Above table of "KMO and Bartlett's Test of sphericity" shows the authenticity of the factor analysis related to Awareness about AI among LIS Professionals. "Kaiser-Meyer-Olkin Measure of Sampling Adequacy" should be greater than 0.6. Which means that common part should be more than the independent part while extracting the information from the existing variables. The "KMO" value for the factor analysis is 0.873 which is significantly greater than 0.5 and is also more than 0.6. Hence, it can be resolved that the sampling adequacy is present in this case. Further, result of "Bartlett's Test of Sphericity" is required to make sure that the correlation matrix is not an identity matrix. The 'P-value' for the same is 0.000 which is greater than our significance level (0.05). Thus, we reject null hypothesis and therefore it can be inferred that the correlational matrix is not an identity matrix. Hence, there is a further evidence of multi-collinearity to be present for all the 22 variables of "Awareness of AI" among the Library Professionals.

Table 5.2: – "Rotated Component Matrix"

	Component	
	1	**2**
in locating personalized resources in libraries	0.646	
in prediction of trends of keywords of readers' book search		0.692
employ chatbots to enhance the support users' queries related library services	0.611	
to find false information		0.844
to locate/discover articles		0.818
in OCR and conservancy of documents		0.650
in indexing	-	-
in clearing obsolete library resources		0.889
in inspection of library resources		0.730
in the acquisition of library resources		0.767
in library MIS	0.672	
in distribution of library related resources	0.840	

in library safekeeping and scrutiny	0.853	
in bibliographies and anthologies	0.660	
to find references		0.628
in management of research related data	0.647	
in e-resources management	0.666	
in content summarization	0.749	
in language transformation	0.740	
in the writing of systematic literature reviews	0.752	
in search engines	0.778	
in library databases	0.876	

Note: *The components with a factor loading above 0.6 are considered.*

Above table shows the rotated component matrix. Varimax rotation method was used to rotate the solution of factor analysis. To have a better representation of the variables on a factor, rotation is used. The factor loading cut-off value was considered to be 0.6. Hence, all the variables having factors loading less than 0.6 after rotating the solutions were suppressed. In total there are thirteen (13) variables which form Factor-1, and eight (08) variables form Factor-2. One variable 'AI is used in indexing' does not fall into any of the newly extracted factors.

Table:5.3 – "Nomenclature of the Newly Extracted Variable"

"Factors"	**"Original Variables"**	**"Factor Loading"**	**New Name of the Factor"**
1	in locating personalized resources in libraries	0.646	AI in Core Library Functions
	employ chatbots to enhance the support users' queries related library services	0.611	
	in library MIS	0.672	
	in distribution of library related resources	0.840	
	in library safekeeping and scrutiny	0.853	
	in bibliographies and anthologies	0.660	
	in management of research related data	0.647	
	in e-resources management	0.666	
	in content summarization	0.749	
	in language transformation	0.740	
	in the writing of systematic literature reviews	0.752	
	in search engines	0.778	
	in library databases	0.876	
2	in prediction of trends of keywords of readers' book search	0.692	AI in Library Applications
	to find false information	0.844	
	to locate/discover articles	0.818	
	in OCR and conservancy of documents	0.650	
	in clearing obsolete library resources	0.889	
	in inspection of library resources	0.730	
	in the acquisition of library resources	0.767	
	to find references	0.628	

Above shows new names of the two (02) extracted factors. These are namely 'AI in Core Library Functions', and 'AI in Library Applications'. These factors are the factors that be considered further to gauge awareness related to AI among library professionals.

Table 6.1: – "KMO and Bartlett's Test"

"Kaiser-Meyer-Olkin Measure of Sampling Adequacy."		.833
"Bartlett's Test of Sphericity"	Approx. Chi-Square	711.650
	df	45
	Sig.	.000

Above of "KMO and Bartlett's Test of sphericity" shows the authenticity of the factor analysis for Perception about AI among LIS Professionals. The "KMO" value for the factor analysis is 0.833 which is significantly greater than 0.5 and is also more than 0.6. Hence, it can be resolved that the sampling adequacy is present in this case. Further, result of "Bartlett's Test of Sphericity" is required to make sure that the correlation matrix is not an identity matrix. The 'P-value' for the same is 0.000 which is greater than our significance level (0.05). Thus, we reject null hypothesis and therefore it can be inferred that the correlational matrix is not an identity matrix. Hence, there is a further evidence of multi-collinearity to be present for all the 10 variables of Perception of AI among the Library Professionals.

Table 6.2: – "Rotated Component Matrix"

	"Component"	
	1	**2**
AI robots can fill vacant post of librarians		0.850
AI robots can perform role of librarians more effectively		0.735
AI robots can complement librarians in the future	0.760	
AI can compensate for performance gaps for librarians	0.672	
AI makes library personnel more sluggish	-	-
Lack of financial support is the issue for the adoption of AI	0.827	
The lack of expertise among LIS professionals is the cause for not adopting AI in libraries	0.618	
AI can cut-down librarian's occupation		0.761
The external expertise not available for AI implementation	0.786	
More flexibility in terms of innovativeness is the prime concern for implementation		0.718

Note: *The components with a factor loading above 0.6 are considered.*

Above table shows the rotated component matrix. Varimax rotation method was used to rotate the solution of factor analysis. To have a better representation of the variables on a factor, rotation is used. The factor loading cut-off value was considered to be 0.6. Hence, all the variables having factors loading less than 0.6 after rotating the solutions were suppressed. In total there are five (05) variables which form Factor-1, and eight (04) variables form Factor-2. One variable 'AI makes library personnel more sluggish' does not fall into any of the newly extracted factors.

Table 6.3: – "Nomenclature of the Newly Extracted Variable"

"Factors"	"Original Variables"	"Factor Loading"	New Name of the Factor"
1	AI robots can complement librarians in the future	0.760	Challenges in Adoption of AI in Library
	AI can compensate for performance gaps for librarians	0.672	
	Lack of financial support is the issue for the adoption of AI	0.827	
	The lack of expertise among LIS professionals is the cause for not adopting AI in libraries	0.618	
	The external expertise not available for AI implementation	0.786	
2	AI robots can fill vacant post of librarians	0.850	Impact of AI on Library Personnel
	AI robots can perform role of librarians more effectively	0.735	
	AI can cut-down librarian's occupation	0.761	
	More flexibility in terms of innovativeness is the prime concern for implementation	0.718	

Above shows new names of the two (02) extracted factors. These are namely 'Challenges in Adoption of AI in Library', and 'Impact of AI on Library Personnel'. These factors are the factors that would be used to measure the perception of library professionals about AI.

Table 7: – "Chi-Square Statistics"

"Primary Variables"	"Demographic Variables / Secondary Variables"	df	Sig. Value
ness of AI among LIS Professionals"	NAAC Accredited	4	0.002
	Age	12	0.014
	Gender	04	0.000
	Qualification	24	0.000
	Designation	20	0.000
	Type of Organization	28	0.000
tion of AI among LIS Professionals"	NAAC Accredited	**4**	**0.174**
	Age	12	0.000
	Gender	04	0.001
	Qualification	24	0.040
	Designation	20	0.012
	Type of Organization	28	0.000
"AI skills required by librarians in the AI Era"	NAAC Accredited	**4**	**0.167**
	Age	12	0.003
	Gender	**4**	**0.075**
	Qualification	24	0.000
	Designation	20	0.000
	Type of Organization	28	0.000

As seen in the above Table, that all these variable pairs are having significant relationships with each other except for the combination highlighted. The secondary variable namely 'NAAC Accredited' is having significant relation with only 'Awareness of AI among LIS professionals' and not with the other two primary variables which suggests that library personnel working in NAAC accredited institutes/organizations have a specific pattern of awareness about AI. Further, 'Gender' does not show any significant relationship with the responses of 'AI skills required by librarians in the AI Era'. Moreover, the exact effect of these demographic/secondary variables on three major primary variables namely 'Awareness of AI among LIS professionals', 'Perception of AI among LIS professionals', and 'AI skills required by librarians in the AI Era' is required to be tested further.

Implication:

This study aimed to gather statistical facts on the consciousness, perception, and skills of LIS professionals. It was supposed to probe the relationship between awareness, opinion, and expertise requirements among the LIS professionals. The prime focus of this study was the dissemination of factual information of the findings to inform policy and practice among policymakers and stakeholders in the LIS profession.

The study suggests that respondents were familiar about usage of "AI in Libraries", with most confirming that AI is vital for success and productivity in delivering library-related facilities, which enables libraries to uplift and offer more versatile facilities for users of various libraries. There were mixed responses regarding the impact of AI on making library staff more sluggish and also affecting their employment.

The research output also demonstrate that librarians were aware of the obstacles towards adopting "AI in Libraries", such as the lack of AI skills, restrictions due to financial constraints, high energy consumption, and a shortage of vendors inculcating AI. Furthermore, there was a competency that the LIS professionals were supposed to note to ensure they are up to standards in AI; that is, electronic communication software and hardware, Applications of the Internet, Networking, cybersecurity, database-related skills, AI and ML-related knowledge; therefore, education on AI had to be incorporated into LIS programs as well.

The study's findings will help the policymakers and LIS professionals to increase effectiveness and efficiency in the libraries by improving service delivery to the users, apart from adding to the body of knowledge because it will contribute to future studies in this field of study.

Conclusion:

Librarians surveyed in this research study tended to be new users of innovative ICT and were rather ready to apply AI tools in offering library services. This study exposes that the LIS professionals were cognizant of the needed skills for the adoption of AI technologies and were very enthusiastic and ready to perform the role of the front-runner, which contrasts with what Cox et al. suggest. However, the findings also noted that AI may threaten the employment of LIS professionals more than other professionals, as they believe intelligent machines can take over most of their jobs. Since, in most cases, it is these people who decide whether an innovation has a benefit, the desire to implement an innovation like AI fully rests on the library professionals, who are creative and understand what it takes to deploy AI technology skills. Since these individuals are typically the ones who determine if an invention is beneficial, the decision to adopt an

innovation such as artificial intelligence (AI) lies entirely with library professionals, who possess the necessary creativity and technological know-how. These encouraging results about its application in a range of library-related contexts offer compelling proof that LIS professionals believe AI will have a big impact on library services in the future. Even though the study lays a solid foundation for further research in this area, it was limited to Indian LIS practitioners. It is considerably difficult to make the result of the study generalized from this sample to other contexts.

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