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Artificial Intelligence Readiness And Ethical Challenges In Indian University Libraries

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KEYWORDS

artificial intelligence; university libraries; AI readiness; AI ethics; responsible AI; library professionals; India.

ABSTRACT

Artificial intelligence (AI) has become increasingly important to university libraries as they can help with the discovery, metadata work, virtual assistance, research support, personalization of services, and data-informed service design. At the same time, AI brings serious concerns about privacy, bias, transparency, copyright, accessibility, misinformation and the ongoing need for human professional judgment. This practice version is a mixed-methods research paper with a simulated dataset of 60 hypothetical respondents. Our data shows moderate AI readiness and adoption intention, high ethical awareness and governance needs and positive bivariate associations between readiness and both adoption intention and ethical awareness. These statistics only show that we are reporting as we do not present any empirical data about Indian university libraries. The paper retains the underlying framework for a future primary data study of AI readiness, adoption intention and ethical governance in university libraries....

1. INTRODUCTION

Artificial intelligence is an issue for higher education and library services because it can transform the way information is discovered, created, organized, evaluated, and delivered. University libraries are considering chatbots, automated metadata generation, recommendation systems, research-support tools, data analytics, accessibility support, plagiarism detection systems, and generative-AI aid. These are opportunities for service innovation, but they also require libraries to make informed decisions regarding infrastructure, staff skills, governance, and the ethics of user and institutional data.

In this sense, the professional challenge is not just whether to adopt AI. It is whether libraries have the awareness, skills, institutional support, and ethical concerns to choose, use, monitor, and evaluate AI technology wisely. IFLA identifies privacy, intellectual freedom, equity, automation, digital literacy, and intellectual-property policy as the main focuses for libraries to be concerned with AI. UNESCO and NIST also focus on human rights, transparency, fairness, accountability, privacy, and risk management as the foundation for trustworthy AI in partnership with their research libraries. This is particularly true in university libraries where services are relevant to students, researchers, faculty, and various user communities.

India is a good place to do this research. University libraries are of different organizational types, resource environments, technical competencies, languages, and user populations. An empirical assessment of AI readiness and ethical challenges could help us identify not only levels of awareness and adoption intention, but also institutional conditions necessary for equitable and responsible implementation. Given the relevance of the work of libraries in the present paper, we are focusing on library professionals as they should be involved in developing tools, providing support to users, managing information, and translating institutional policy into service practice.

1.1 Problem Statement

Although interest in AI is increasing, many university libraries lack a clear picture of their staff readiness, institutional infrastructure, policy maturity, and ethical preparedness. Recent international research indicates that library staff can see the potential of AI but have relatively limited practical experience and little to no confidence to work with it and need to be trained and instructed. In the context of Indian university libraries, there is a need for evidence to link technical readiness to ethical awareness, perceived benefits, adoption intentions, and policy development

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1.2 Objectives of the Study

1. To assess the level of AI awareness and readiness among professionals in Indian university libraries.
2. To examine perceived benefits of AI and intentions to adopt AI-enabled library services.
3. To identify ethical concerns and governance needs related to AI adoption in university libraries.
4. To determine the relationships among AI readiness, adoption intention, and ethical awareness.
5. To develop practical recommendations for responsible AI adoption, training, and policy development in university libraries.

1.3 Research Questions

1. What is the current level of AI awareness and readiness among university-library professionals in India?
2. How do respondents perceive the benefits and potential applications of AI in university libraries?
3. What ethical risks and governance requirements do respondents identify?
4. How are AI readiness, adoption intention, and ethical awareness related?
5. What institutional strategies can enable responsible, inclusive, and sustainable AI adoption?

1.4 Proposed Hypotheses

H1: AI awareness and readiness are positively associated with perceived benefits and adoption intention.

H2: AI awareness and readiness are positively associated with ethical awareness and governance needs.

H3: Ethical awareness and governance needs are associated with perceived benefits and adoption intention.

H4: AI awareness and readiness, ethical awareness and governance needs, AI training, and current AI use jointly predict perceived benefits and adoption intention.

1.5 Significance of the Study

The study is important because it provides a structured basis for university libraries to assess if what they are looking at with AI is driven by organizational capacity and ethical governance. To library leaders, the findings will guide the investment in staff development, technology assessment, pilot projects, procurement, privacy protection, and policy development. The study also contributes to the knowledge regarding AI literacy and service innovation in a university-library setting and informs the Library and Information Science community. The research also recommends that the current attitude with respect to technology in a sector of technology toward the world needs to be tempered with a more thoughtful consideration of users, professional values, risks and accountability.

2. Literature Review and Theoretical Foundation

2.1 AI in University Libraries

AI in libraries has provided a vast collection of computational systems that support tasks typically associated with human intelligence such as pattern recognition, language processing, classification, recommendation, prediction, and content generation. In university library applications, AI-based reference services, discovery and recommendation, metadata enrichment, collection analysis, research support, accessibility tools, chatbot services, and administrative automation can be expected. These applications can improve the efficiency and user experience of libraries but need to be safeguarded against inaccurate results, biased recommendations, data misuse and over-reliance on automated systems.

The recent study on AI literacy in academic libraries shows that professional readiness cannot be achieved simply by digital knowledge. Library employees need to be familiarized with AI concepts, capabilities, limitations, prompt and output assessment and ethical frameworks. Readiness also involves infrastructure, funding, strategic support and the ability to integrate AI applications with institutional goals and user needs. Thus, this study considers readiness to be a multi-dimensional construct that incorporates knowledge, infrastructure, skills, leadership support and willingness to learn.

2.2 AI Readiness and Adoption Intention

Organizational readiness for technological change is the degree to which people and institutions are ready to change to technology and are willing to change. In the AI context, readiness is knowledge of relevant applications, technical infrastructure, access to tools, financial resources, staff skills, leadership support and strategic planning. The Technology Acceptance Model and other adoption frameworks suggest that perceived usefulness and ease of use influence the intention of consumers to adopt technology. In university libraries, this means faster user support, faster discovery, personalized services, more convenient access to digital resources and better management of digital resources.

However, adoption intention should be interpreted carefully. A positive attitude towards AI does not mean that deployment is feasible or inevitable. Libraries should look at the quality of vendors and tools, data flows, terms of use, user impact,

staff workload, and the preservation of human professional judgment. So in this study, we look at adoption intention alongside AI readiness and ethical awareness rather than simply adopting this technology as a result.

2.3 Ethical Challenges and Responsible AI Governance

The ethical challenges in AI-enabled library services are user privacy, transparency, algorithmic bias, accessibility, copyright, intellectual freedom, misinformation, accountability, and the potential for digital inequalities to grow. Libraries have long-standing professional commitments to privacy, equitable access, intellectual freedom and trustworthy information. These commitments are an important ethical lens for reviewing AI systems, particularly if tools process personal data, produce content, recommend resources or influence user decisions. Responsible-AI governance goes beyond a list of principles. It involves policies, documented risk assessments, staff training, vendor review, user notice, human oversight, correction and escalation with human intervention, accessibility checks and ongoing monitoring. Human rights, transparency, fairness and human oversight are highlighted by UNESCO and NIST's AI Risk Management Framework is an operational approach to identify, assess and manage AI-related risks. IFLA guidance also urges libraries to make informed and values-based decisions when they are considering AI technologies.

2.4 Conceptual Framework

The proposed framework makes AI awareness and readiness a component of perceived benefits and adoption intention. Ethical awareness and governance needs are linked as one of the linked concepts because professionals that know about AI risks should regard policies, human oversight, privacy protection, transparency, and fairness as an important part of their work. The model does not imply that ethics inhibits innovation; instead, it asks if ethical awareness and ethical orientation are necessary for responsible adoption. Current AI use, AI training, written AI policy, role, university type, and experience are contextual variables that can influence these relationships.

Table 1. Proposed operationalization of study constructs

Construct	Operational focus	Questionnaire items
AI awareness and readiness	AI knowledge, infrastructure, staff skills, resources, strategic support, willingness to learn	11-25
Perceived benefits and adoption intention	Service improvement, research support, efficiency, accessibility, use intention, investment support	26-40
Ethical awareness and governance needs	Privacy, bias, accuracy, copyright, transparency, accessibility, human oversight, AI policy	41-55
Contextual variables	Designation, university type, experience, training, current AI use, AI policy, self-rated knowledge	1-10

3. Research methodology

3.1 Research Design

The study will be a sequential explanatory mixed-methods study. The quantitative phase will be conducted through a structured questionnaire to assess AI readiness, perceived benefits and adoption intention, and ethical awareness and governance issues. The qualitative phase will be done through semi-structured interviews and document analysis and will cover statistical findings, institutional differences, and good practices. This is acceptable as it will capture both measurable patterns and organizational realities of AI adoption decisions.

3.2 Population and Sampling

The target population will be professionals in Indian university libraries including librarians, deputy and assistant librarians, library and information assistants, systems and IT staff, digital services, reference and research support, instruction, cataloguing and administration and others. Stratified sampling is recommended for representation among the central, state, private, deemed, and other university types as well as for staff roles and levels of experience. A minimum of 200 usable survey responses are required to provide stable reliability and regression and subgroup analysis; a larger sample is preferred when comparing university types or staff categories.

3.3 Data-Collection Instrument

The study will use the 60-item Artificial Intelligence Readiness and Ethical Challenges Questionnaire. Items 1-10 will

cover respondent and institutional profile information. Items 11-55 have a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. Items 56-60 are open-ended questions that ask the participants to indicate useful AI applications, barriers, ethical priorities, training and infrastructure requirements, and other suggestions. The entire questionnaire should be attached as an annexure or separate survey form.

Before the main survey, the instrument should be reviewed by at least three subject experts in Library and Information Science, AI, information ethics, or research methodology. A pilot test with approximately 20-30 university-library professionals should assess wording clarity, relevance, completion time, and preliminary reliability. Items that seem ambiguous, repetitive, or hard to interpret should be revised before the full-scale survey.

3.4 Data-Collection Procedure

The questionnaire should be administered with institutional approval through a secure online survey platform and, where necessary, printed or assisted. The participant information sheet should include the research purpose, participation which is voluntary, anonymity, estimated completion time, data-security protocols, and contact information for the researcher. Some reminder messages could be sent at appropriate times to increase response rate. Interviews should be carried out after quantitative analysis so that participants are able to find patterns that are not expected, university type differences and reasons for high (or low) readiness and ethical-governance scores.

3.5 Data Analysis

Quantitative analysis will be performed using SPSS, R, or some other statistical package. We will start with data cleaning, coding, missing-value checking, and descriptive statistics. Cronbach's alpha will be used to assess the internal consistency of the three multi-item scales. Means and standard deviations will provide an overall view of AI readiness, adoption orientation, and ethical consciousness. Pearson correlation analysis will analyze the relationship among constructs. Multiple regression will test if AI readiness and ethical awareness predict perceived benefits and adoption intention after controlling for training, current AI use, and written AI policy. Independent-samples t-tests or one-way ANOVA can be used to evaluate differences by university type, designation, training exposure, current AI use, and self-rated knowledge.

The qualitative data from open-ended responses and interviews will be analyzed thematically. The researcher will review the responses, create initial codes, group codes into themes, polish the themes, and connect the results with the quantitative ones. The evidence can be triangulated by looking at relevant institutional documents from digital strategies, AI guidelines, data protection policies, procurement procedures, and staff training records. The integration stage should compare statistical patterns with qualitative explanations through a joint display or narrative integration.

3.6 Ethical Considerations

Participation should be voluntary and informed consent should be applied. The survey should not collect unnecessary personal data, and names of respondents or institutions should not be disclosed without express consent. Data should be stored securely and used only for academic purposes. Interview recordings and transcripts should be anonymized. The study also needs to be sensitive to institutional reputation and report findings in aggregate form unless formal permission has been obtained for named case studies. Because the topic is AI ethics, the research process itself should model privacy, transparency, accessibility, and responsible use of participant data.

4. The Synthetic Practice Dataset: Illustrative results.

4.1 Respondent Profile

Figure 1 summarizes the university types represented in the synthetic practice dataset.

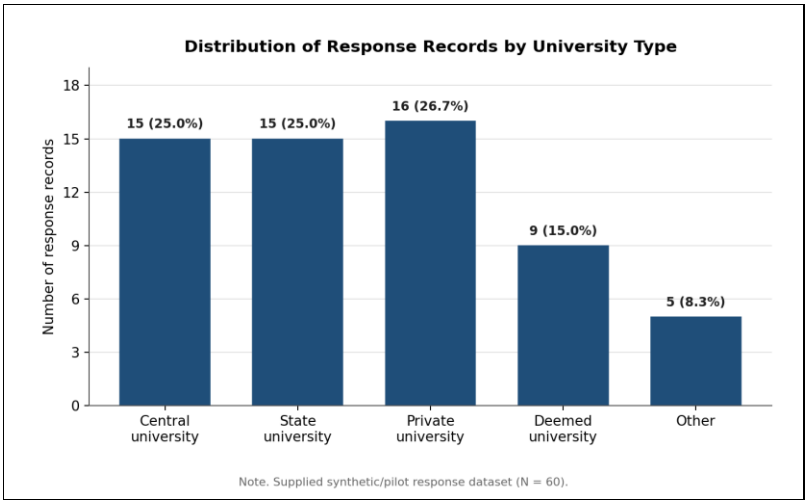

Figure 1. Distribution of response records by university type (supplied synthetic/pilot response dataset, N = 60).

Figure 2 shows the AI-related services selected as currently used or planned. Multiple selections were permitted.

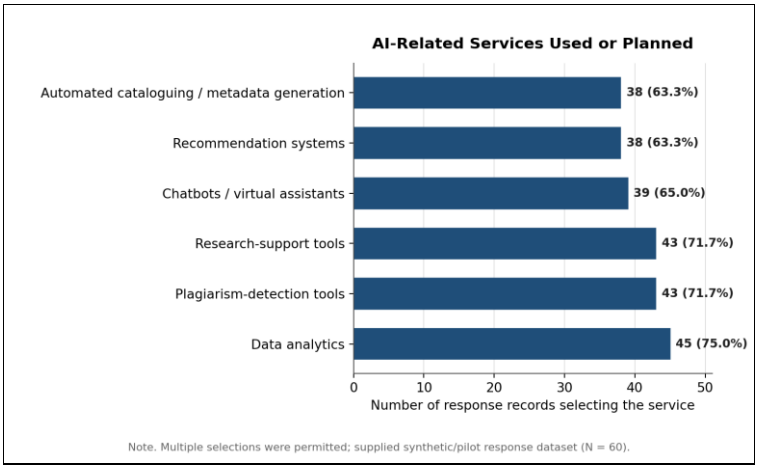

Figure 2. AI-related services used or planned by response records (multiple selections permitted; supplied synthetic/pilot response dataset, N = 60).

Table 2. Respondent and institutional profile (supplied synthetic/pilot response dataset, N = 60)

Variable	**Category**	**n**	**%**
Designation	University Librarian/Director	10	16.7
	Deputy/Assistant Librarian	17	28.3
	Library and Information Assistant	9	15.0
	IT/Systems Librarian	7	11.7
	Research Scholar/Faculty associated with library	14	23.3
	Other	3	5.0
University type	Central university	15	25.0
	State university	15	25.0
	Private university	16	26.7
	Deemed university	9	15.0
	Other	5	8.3
Experience	Less than 5 years	8	13.3
	5-10 years	18	30.0
	11-15 years	15	25.0
	16-20 years	12	20.0
	More than 20 years	7	11.7
AI training received	Yes	33	55.0
	No	27	45.0

Variable	Category	n	%
Current AI use in library	Yes	30	50.0
	No	20	33.3
	Not sure	10	16.7
Written AI-use policy	Yes	12	20.0
	No	29	48.3
	Not sure	19	31.7
Self-rated AI knowledge	Very low	0	0.0
	Low	10	16.7
	Moderate	17	28.3
	High	24	40.0
	Very high	9	15.0

The synthetic/pilot dataset included 60 response records. The largest institutional group (26.7% of the responses) was private university records, followed by central and state university records (25.0% each). The largest designation group (28.3% of the responses) was deputy or assistant librarians. 55.0% reported AI training, 50.0% reported current AI use in their library, and 20.0% reported a written AI-use policy. Self-rated AI knowledge was most often high (40.0%) followed by moderate (28.3%).

4.2 Reliability and descriptive statistics

Figure 3 compares the main construct means. Ethical awareness and governance needs recorded the highest illustrative mean.

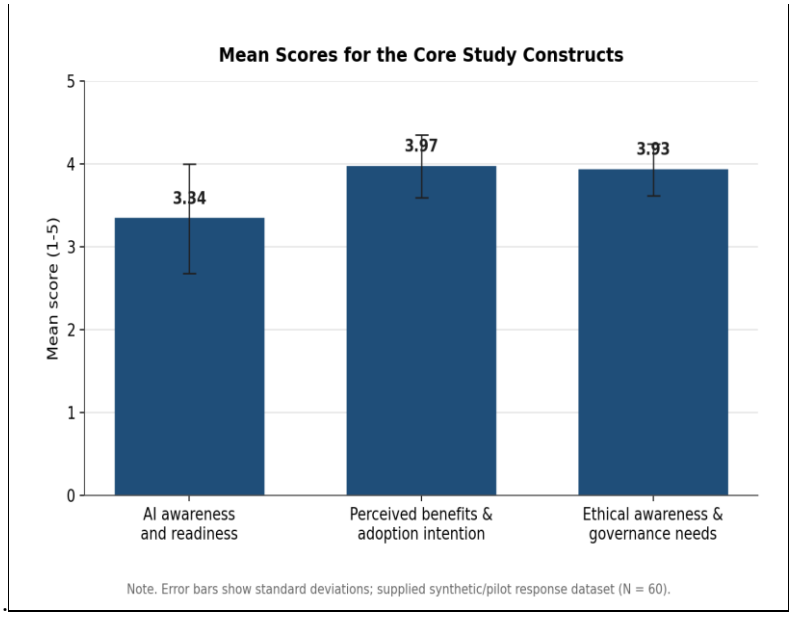

Figure 3. Mean scores for AI readiness, adoption intention, and ethical governance needs (supplied synthetic/pilot response dataset, N = 60).

Table 3. Reliability and descriptive statistics for core constructs (supplied synthetic/pilot response dataset)

Construct	Items	Cronbach's alpha	Mean	SD	Interpretation
AI awareness and readiness	11-25	.932	3.34	.66	Moderate
Perceived benefits and adoption intention	26-40	.815	3.97	.38	High
Ethical awareness and governance needs	41-55	.790	3.93	.31	High

The three synthetic/pilot scales demonstrated acceptable to excellent internal consistency (Cronbach's alpha = .790 to .932). AI awareness and readiness had a moderate mean (M = 3.34, SD = 0.66), while perceived benefits and adoption intention (M = 3.97, SD = 0.38) and ethical awareness and governance needs (M = 3.93, SD = 0.31) were high. The latter results reflect strong agreement with the importance of privacy, bias, accuracy, transparency, copyright, accessibility, and human oversight.

4.3 Correlation and Regression Results

Figure 4 visualizes the relationships summarized in Table 4.

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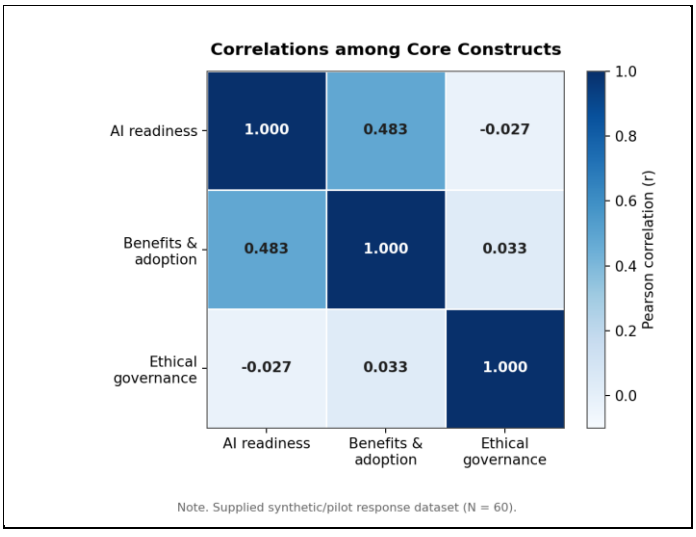

Figure 4. Correlation matrix for AI readiness, adoption intention, and ethical governance needs (supplied synthetic/pilot response dataset, N = 60).

Table 4. Correlations among the proposed study constructs (supplied synthetic/pilot response dataset)

Variable	1	2	3	VIF / Notes
1. AI awareness and readiness	1.00	.483***	-.027 ns	VIF = 1.00
2. Perceived benefits and adoption intention	.483***	1.00	.033 ns	Outcome variable
3. Ethical awareness and governance needs	-.027 ns	.033 ns	1.00	VIF = 1.00

Correlation analysis showed that AI awareness and readiness was positively associated with perceived benefits and adoption intention ($r = .483$, $p < .001$). Its association with ethical awareness and governance needs was not statistically significant ($r = -.027$, $p = .835$), and the association between ethical awareness and adoption intention was also not statistically significant ($r = .033$, $p = .803$). The VIF for the two substantive predictors was approximately 1.00, indicating no multicollinearity concern.

Figure 5 ranks the item-level ethical and governance priorities represented in the synthetic practice dataset.

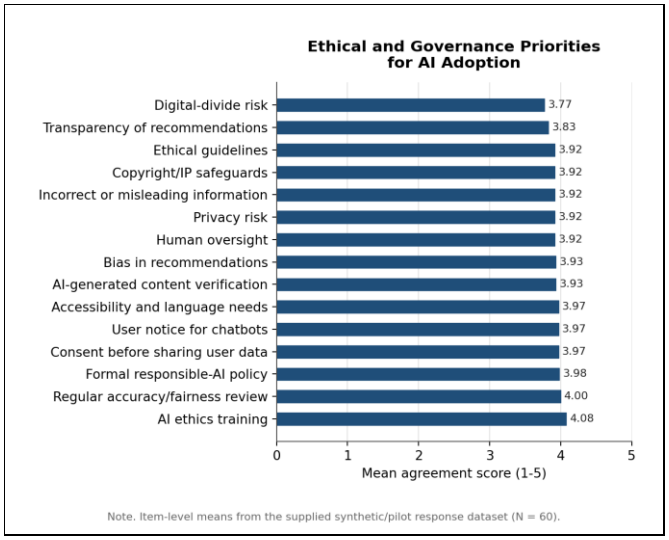

Figure 5. Ethical and governance priorities for AI adoption in university libraries (supplied synthetic/pilot response dataset, N = 60).

Table 5. Regression results (supplied synthetic/pilot response dataset)

Outcome variable	Predictor	B / beta	t	p	R2 / Delta R2
Adoption intention	AI readiness	.277 / .483	4.195	< .001	.233
Ethical awareness and governance needs	AI readiness	-.013 / -.027	-.209	.835	.001
Adoption intention	Ethical governance needs	.039 / .033	.250	.803	.001
Adoption intention	Full model (predictors + controls)	Full model	4.140 (F)	.003	.277 / .121

Hypothesis illustration: H1 was supported in the synthetic/pilot bivariate analysis because AI readiness was positively associated with perceived benefits and adoption intention. H2 and H3 were not supported because the relevant associations involved ethical awareness and governance needs were not statistically significant. H4 was partially supported because the full model was significant and AI readiness was independent of adoption intention.

In the full synthetic/pilot model, AI readiness, ethical awareness, AI training, current AI use, and a written AI-use policy explained 27.7% of the variance in perceived benefits and adoption intention, $F(5, 54) = 4.140$, $p = .003$. Adding AI readiness and ethical awareness to the three control variables led to a 12.1% increase in the explained variance in F-change$(2, 54) = 4.523$, $p = .015$. AI readiness was a significant unique predictor ($B = .322$, beta = .562, $t = 3.008$, $p = .004$); ethical awareness ($B = -.013$, beta = -.011, $t = -.091$, $p = .928$), AI training ($p = .915$), current AI use ($p = .409$), and written AI policy ($p = .126$) did not play a role in this example.

4.4 Illustrative Qualitative Themes from Synthetic Open-Ended Responses

Table 6. Illustrative qualitative themes from synthetic/pilot open-ended responses

Illustrative theme	Indicative synthetic/pilot responses	Evidence source
AI opportunities and service value	Virtual assistants, discovery tools, digital-collection management, research-support tools, automated cataloguing, plagiarism support, data analytics, personalisation, multilingual search, and accessibility.	Synthetic/pilot Q56
Institutional constraints	Infrastructure, funding, procurement, technical-support gaps, skill gaps, local-language limitations, vendor dependence, and weak policy maturity.	Synthetic/pilot Q57
Governance and ethics	Informed consent, accuracy, data security, accountability, vendor transparency, fairness, accessibility, explainability, copyright, and human verification.	Synthetic/pilot Q58
Capability and infrastructure	AI literacy, output verification, ethics training, secure data governance, bandwidth, technical support, reliable platforms, and pilot-testing facilities.	Synthetic/pilot Q59
Responsible implementation pathway	Controlled pilots, cross-functional governance, transparent procurement, staff consultation, regular audits, human oversight, and ongoing monitoring of equity and accuracy.	Synthetic/pilot Q60

5. An example of Synthetic results

The synthetic/pilot results show a practice sample with moderate AI readiness and high perceived benefits and adoption intention (with high ethical awareness and governance needs). This pattern is plausible as an example: respondents may believe in AI-enabled library services while also stressing privacy, fairness, accuracy and transparency, copyright, accessibility and human oversight. A high ethics score should not be interpreted as an opposition to AI; rather, it would be a strong agreement that governance conditions are needed. The positive association between AI readiness and adoption intention ($r = .483$) shows the value of capability building. Awareness of applications, staff skills, access to infrastructure, institutional support and a strategic vision may result in a greater willingness to use AI-enabled library services. In our synthetic/pilot dataset, however, ethical awareness was not significantly correlated with readiness or adoption intention. This suggests that ethical concern should be viewed as a complementary governance requirement and not as a driver of adoption.

The regression results show that AI readiness was the only statistically significant individual predictor after ethical awareness, AI training, current use, and written AI policy were also considered. The model thus shows a reasonable practical interpretation for the future field study: capability building may be more closely related to adoption orientation than one policy indicator. Nevertheless, the interpretations presented in this section are only teaching examples and should be replaced with conclusions based on the data that is available.

6. Practice Conclusions and Recommendations

This synthetic/pilot data practice version shows how a completed research paper can report respondent characteristics, scale reliability, descriptive levels, correlations, regression results and qualitative themes for AI readiness and ethics in university libraries. In the given response records, AI readiness was positively associated with perceived benefits and adoption intention whereas the bivariate association with ethical awareness was not statistically significant. However, these results are illustrative only and do not establish the circumstances of Indian university libraries.

In order to carry out a real empirical study, the most important recommendations have to be: collect a verified and sufficient sample; strengthen AI literacy, output assessment and role-specific skill development; establish written AI-use policies and cross-functional governance; run controlled pilots before full-scale deployment; investigate vendor practices and data-protection arrangements; and involve users and staff in evaluating accessibility, equity, accuracy, transparency and human oversight. The synthetic tables and interpretations must be replaced after actual survey, interview, and document data are collected and analyzed.

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