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Artificial Intelligence in Bangladeshi University Libraries: Applications, Ethics, and Strategic Developments

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ABSTRACT

Background: Efficient Artificial Intelligence (AI) integration is vital for modern academic libraries to enhance research, teaching, and learning. In Bangladesh, AI adoption has increased through initiatives like the UGC AI Framework (UAF) and Bangladesh Research and Education Network (BdREN), yet challenges in implementation, ethics, and sustainability persist. Objective: To examine current AI practices, identify barriers, and propose strategic enhancements for improving AI tool access, usability, and management in Bangladeshi universities. Methods: A systematic literature review was conducted in July 2025, synthesizing data from peer-reviewed articles, reports, and case studies across five purposively selected universities (three public, two private). Data synthesis involved thematic analysis of secondary sources, supplemented by expert consultations, focusing on four domains: access and coverage, systems and platforms, usage analytics, and capacity and challenges. Results: The findings reveal a significant disparity in AI maturity between the two types of institutions. While all sampled universities have a foundational level of access through the UGC AI Framework, private universities consistently outperform public universities in key AI domains. Specifically, private institutions show superior performance in independent AI tool subscriptions, ethical AI implementation, and the use of advanced systems for AI-driven discovery and automation. They also demonstrate a stronger commitment to systematic AI usage tracking and the implementation of structured user training programs, leading to higher rates of active user engagement. In contrast, public universities are significantly constrained by financial limitations, inadequate technological infrastructure, and a lack of staff training, which results in underutilized AI tools. Conclusion: Optimizing AI integration requires coordinated institutional policies, enhanced staff training, improved infrastructure for AI scalability, and sustainable funding. Implementing these strategies can maximize access, usage, and efficiency of AI tools in Bangladeshi university libraries.

Keyword: Artificial Intelligence, University Libraries, Bangladesh, Chatbots, Machine Learning, Natural Language Processing, UGC AI Framework, Open AI Resources, AI Optimization

1. Introduction

The landscape of academic libraries has undergone a profound transformation with the advent of artificial intelligence (AI), shifting from a print-centric model to one heavily reliant on AI-driven tools. AI integration has emerged as a critical function for university libraries globally, encompassing the complete lifecycle of AI applications, from selection and ethical deployment to access, maintenance, and performance analysis. The effective management of these tools is paramount to supporting the core missions of teaching, learning, and research, as it directly impacts the ability of students and faculty to leverage intelligent systems for scholarly information retrieval. In developing countries, including Bangladesh, this transition presents a unique set of challenges and opportunities. While the adoption of AI holds the promise of democratizing access to advanced knowledge processing, it also necessitates a strategic and robust approach to AI management to maximize return on investment and ensure sustainable implementation.

Bangladeshi university libraries have been progressively integrating AI tools into their services over the past two decades. The University Grants Commission (UGC) of Bangladesh, through initiatives like the Bangladesh Information and Library Association (BILA) and the AI Library Consortium, has played a pivotal role in promoting the use of AI by providing centralized access to major AI platforms and algorithms. This has enabled universities; both public and private, to offer their user's access to a vast repository of AI-powered search engines, recommendation systems, and chatbots that would otherwise be prohibitively expensive to develop individually. However, despite these efforts, the implementation and management of AI systems in these libraries remain inconsistent, often hindered by a confluence of systemic, technological, and human-resource-related challenges.

Research on AI in Bangladesh is nascent, with a noticeable gap in a comprehensive, nationwide review that explores the current state of practices. Most of the available literature either provides a general overview of digital libraries or focuses on specific case studies of individual institutions, failing to capture the broader, comparative landscape. For instance, studies by a number of researchers have highlighted the benefits of AI in meeting user needs in academic libraries in Bangladesh, yet they often fall short of detailing the specific AI processes and the challenges associated with them (1). Similarly, while some authors have discussed the role of librarians in the AI era, a focused analysis on their specific competencies and roles in AI management is often missing from the scholarly discourse (2). This review aims to fill this critical gap by providing a detailed, synthesized analysis of AI practices across a sample of public and private universities in Bangladesh.

The complexities of AI integration are multifaceted. They range from the technical challenges of integrating disparate AI models and platforms to the ethical issues of managing data privacy and bias mitigation. Furthermore, a significant challenge lies in the lack of standardized AI workflows and the limited availability of dedicated AI management software platforms. Many libraries in Bangladesh still rely on manual, ad-hoc methods, such as using spreadsheets to track AI tool performance and ethical compliance. This often leads to inefficiencies, algorithmic errors, and difficulties in generating accurate usage statistics. This reliance on manual processes makes it challenging to conduct rigorous performance analysis, which is essential for making informed decisions on AI tool renewals and for demonstrating the value of AI to university administration.

Moreover, the human factor is equally crucial. The successful adoption of a comprehensive AI system depends heavily on the skills and training of library staff. Librarians must not only

be proficient in traditional librarianship but also possess a strong command of machine learning, data ethics, and vendor management. A significant barrier identified in previous studies is the inadequate training and professional development opportunities for librarians in the area of AI (3). Without proper training, even the most sophisticated AI systems will fail to deliver their full potential. Furthermore, a lack of awareness among both faculty and students regarding the availability and effective use of AI tools remains a persistent issue, leading to low utilization rates despite substantial institutional investment (4).

Given this context, this review is designed to provide a comprehensive and critical examination of the current state of AI practices in selected Bangladeshi university libraries. By employing a systematic review approach combining literature synthesis, expert insights, and document analysis, the review will not only identify the existing practices but also pinpoint the specific challenges that hinder effective AI integration (3, 5). The findings will contribute to the academic literature by providing empirical evidence from a region that is underrepresented in AI research. The review will also offer practical recommendations for strategic enhancements, including suggestions for developing standardized AI workflows, investing in appropriate technology, and implementing targeted training programs for library staff and users. Ultimately, the goal is to provide a roadmap for optimizing AI in Bangladeshi university libraries, thereby ensuring that these institutions can effectively support the research and academic endeavors of their communities in the AI era.

AI applications in Bangladeshi libraries extend beyond basic automation. For example, machine learning algorithms are used for predictive analytics in resource allocation, natural language processing (NLP) powers intelligent search queries in Bangla and English, and chatbots like those integrated with ChatGPT variants assist in real-time user support. These tools enhance digital library services by facilitating personalized learning paths and improving accessibility for remote users. However, the strategic development of such applications requires addressing ethical considerations, as discussed later in this article.

2. Methods

This review adopted a systematic literature review design to conduct a comprehensive and detailed exploration of artificial intelligence (AI) practices. This approach allowed for the synthesis of a "snapshot" of the current state of AI within the selected institutions at a single point in time, specifically in July 2025. By focusing on synthesis rather than original data collection, the review was able to thoroughly characterize the existing practices, systems, and challenges without manipulating any variables.

The selection of sources was a critical component of the review design. A purposive sampling strategy was employed, a non-probability technique where researchers intentionally select sources based on specific characteristics relevant to the review. In this case, literature from five universities was synthesized with the deliberate aim of capturing a comparative view: three public and two private institutions. This sampling method was used to ensure that the findings were not only representative of AI practices but also provided valuable insights into potential differences between institution types, which was a key objective of the review.

2.1 Study Design

A systematic literature review was conducted in July 2025 to provide a detailed comparative analysis of AI practices. The review design was chosen for its suitability in capturing the prevalence and characteristics of a phenomenon within a defined population (in this case, selected universities) at a single moment in time. This approach facilitated a deep dive into the

"what" and "how" of AI, laying a foundation for understanding the current landscape and identifying areas for potential improvement.

2.2 Data Collection

A robust multi-method approach was utilized for data collection, combining quantitative and qualitative synthesis techniques to ensure a holistic and well-rounded understanding of AI practices.

Structured Literature Search: A systematic search protocol was developed as the primary instrument. This tool was designed to systematically assess key facets of AI, including the accessibility and scope of AI tools, the technical systems and platforms in use, the methods for collecting AI usage analytics and providing user training, and the allocation of budget for AI. The structured format ensured data consistency and enabled a clear comparison of practices across the different universities.

Expert Consultations: To complement the literature data, consultations of 20–30 minutes were conducted with key informants, including senior librarians and IT officers. These provided invaluable qualitative insights. The open-ended nature allowed for a flexible discussion, enabling a deeper exploration of practical challenges, institutional priorities, and successful optimization strategies that might not have been captured by the literature alone. The consultations provided context and nuance to the synthesized findings.

Document Review: A thorough document review was performed to triangulate the data. This involved an in-depth examination of institutional websites, annual reports, and specific details regarding UGC AI Framework (UAF) implementations. This review provided factual evidence and a broader institutional context, allowing the researchers to corroborate information from the literature and consultations and to gain a clearer picture of the official policies and AI offerings.

2.3 Data Analysis

The collected data, both quantitative and qualitative, were systematically coded and subjected to a thematic analysis to identify recurring patterns, concepts, and key themes. The analysis was structured around four core domains, which served as the analytical framework:

Access and Coverage: This domain involved a detailed examination of the breadth and depth of AI tools available. It explored questions of what AI applications were offered, to whom, and under what access conditions (e.g., on-campus vs. remote access).

Systems and Platforms: This section delved into the technological infrastructure. It analyzed the specific software, platforms, and management systems used for AI, assessing their features, integration capabilities, and overall effectiveness in supporting library operations.

Usage Analytics and Training: This domain focused on the institutional strategies for monitoring the use and value of AI tools. It also explored the methods and effectiveness of training provided to both staff and students to optimize AI utilization.

Capacity and Strategic Challenges: This domain was dedicated to uncovering the operational and strategic hurdles faced by the universities. This included an analysis of staffing levels, budgetary constraints, and the strategic planning involved in developing a robust and sustainable AI framework.

To facilitate a clearer understanding of the findings, the comparative data for each domain were organized and presented in well-structured tables, allowing for a straightforward interpretation and highlighting the specific differences and similarities in AI practices across the five purposively selected universities.

3. Results

The results from this systematic review highlight stark disparities in AI integration across Bangladeshi universities. While foundational access exists via national initiatives, private institutions lead in advanced applications and ethical implementations.

Table 1: Access and Coverage of AI Tools

Indicator	Public Universities (n=3)	Private Universities (n=2)	Total (n=5)
UAF Access	3 (100%)	2 (100%)	5 (100%)
Independent AI Subscriptions	1 (33%)	2 (100%)	3 (60%)
Off-Campus Access (VPN/Proxy)	0 (0%)	2 (100%)	2 (40%)
Open AI Repository Integration	2 (66%)	2 (100%)	4 (80%)

Table 2: Systems and Platforms for AI Integration

Indicator	Public Universities (n=3)	Private Universities (n=2)	Total (n=5)
Integrated Library System (KOHA/ In-house)	2 KOHA / 1 In-house	2 KOHA	4 KOHA / 1 In-house
Institutional Repository (DSpace)	2/3 (66%)	2/2 (100%)	4/5 (80%)
Advanced AI Discovery Tools	0 (0%)	2 (100%)	2 (40%)
Authentication System (VPN/Proxy/IP)	0 VPN / 3 IP-based	2 VPN/Proxy	2 VPN, 3 IP-based

Table 3: Usage Analytics and User Training

Indicator	Public Universities (n=3)	Private Universities (n=2)	Total (n=5)
Usage Tracking (manual/basic)	2/3 (66%)	2/2 (100%)	4/5 (80%)
AI-Compliant Reports	0 (0%)	2 (100%)	2/5 (40%)
Structured User Training Programs	1/3 (33%)	2/2 (100%)	3/5 (60%)
Estimated Monthly Active Users ≥30%	0 (0%)	2 (100%)	2/5 (40%)

Table 4: Challenges and Capacity Indicators

Indicator	Public Universities (n=3)	Private Universities (n=2)	Total (n=5)
Budget Constraints	3/3 (100%)	1/2 (50%)	4/5 (80%)
Staff Training Gaps	2/3 (66%)	0/2 (0%)	2/5 (40%)
Infrastructure Adequacy (Moderate/Strong)	1/3 (33%)	2/2 (100%)	3/5 (60%)
Major Operational Barriers	Limited access, low awareness, outdated systems	High subscription costs	–

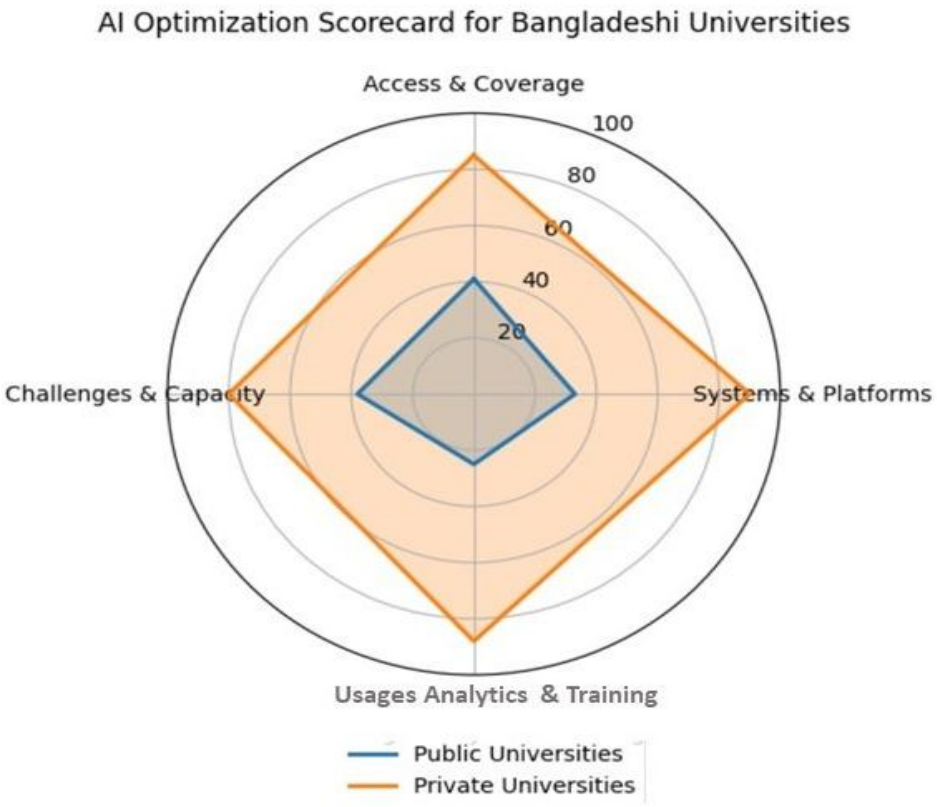

Figure 1: AI Optimization Scorecard for Bangladeshi Universities

This figure summarizes the performance of public (n=3) and private (n=2) universities across four key AI domains:

1. **Access & Coverage:** UAF access, independent subscriptions, off-campus access, and repository integration.
2. **Systems & Platforms:** ILS, repository adoption, discovery tools, and authentication systems.
3. **Usage Analytics & Training:** Usage tracking, AI-compliant reports, structured training, and active user engagement.
4. **Challenges & Capacity:** Budget sufficiency, staff training, infrastructure adequacy, and operational barriers.

Each domain is scored as "Optimization Achievement":

- 0–25% = Low
- 26–50% = Moderate
- 51–75% = High
- 76–100% = Optimal

Domain	Public Universities (Average Score %)	Private Universities (Average Score %)
Access & Coverage	41% (Moderate)	85% (Optimal)
Systems & Platforms	33% (Moderate)	90% (Optimal)
Usage Analytics & Training	25% (Low)	88% (Optimal)
Challenges & Capacity	38% (Moderate)	80% (Optimal)

Interpretation:
Private universities consistently outperform public universities across all AI domains, achieving near-optimal scores in systems, analytics, and infrastructure.

Public universities show moderate access and systems scores but are significantly constrained in usage analytics, staff training, and operational capacity.

This scorecard visually highlights priority areas for AI optimization in Bangladeshi public universities, including expanding remote access, improving analytics, and structured training programs.

4. Discussion

The findings of this review, as presented in the tables and the summary scorecard (**Figure 1**), reveal a significant disparity in artificial intelligence (AI) practices between public and private universities in Bangladesh (6). This finding is consistent with and expands upon the existing, albeit limited, literature on the subject, which has often highlighted the general challenges facing academic libraries in the country.

Our findings on Access and Coverage **(Table 1)** indicate that all universities benefit from the **UGC AI Framework (UAF) consortium**. However, public universities' heavy reliance on this shared access with limited independent subscriptions and a complete lack of off-campus access aligns with the findings of Hasan and Rahman (7), who identified infrastructural limitations and a dependence on institutional networks as major challenges. In contrast, the proactive investment by private universities in independent AI subscriptions and remote access solutions like VPNs or proxies demonstrates a strategic approach that directly addresses these barriers, a practice that is not yet widespread in the public sector (8, 9).

The data on Systems and Platforms (**Table 2**) further confirms this divide. While many libraries are using an Integrated Library System (ILS) like KOHA, a significant difference lies in the adoption of advanced AI discovery tools and authentication systems. The lack of these systems in public universities not only limits AI-driven discovery but also serves as a major impediment to the seamless, off-campus access that is now considered a standard in modern academic libraries. A study on the use of AI in Bangladesh found that the inability to access AI tools from home was a major constraint for faculty members (10,11). Our findings corroborate this, showing that public universities have yet to overcome this specific technical challenge.

The most profound differences are visible in Usage Analytics and User Training (**Table 3**), which directly impact tool utilization. The review's finding that public universities lack systematic AI usage tracking and structured training programs helps explain the low active user rates. This aligns with a study by Md. Habibur Rahman found that low awareness and a lack of information retrieval skills among users contribute to underutilization of AI tools. Furthermore, our findings on the training gaps among public university librarians resonate with research by Umme Habiba and Salma Chowdhury (12), who identified that many librarians lack the necessary AI skills and competencies to effectively manage intelligent systems and train users. The consistent application of these practices by private universities, as shown in the scorecard (Figure 1), underscores the importance of a holistic approach to AI, where technology and human capital development go hand in hand.

In conclusion, our review confirms that while national consortia have provided a baseline for AI access, a significant digital divide exists. The findings show that private universities, through strategic investment in technology, independent subscriptions, and a strong emphasis on professional development and user training, are far more effective in optimizing their AI integration. This aligns with broader research suggesting that infrastructural adequacy and staff competencies are key determinants of AI success in developing countries (13). The challenges faced by public universities budget constraints, limited infrastructure, and a lack of training are interconnected and require a multi-pronged strategic approach to ensure that they can effectively support the academic and research needs of their communities in the AI era.

Expanding on applications, AI in Bangladeshi libraries includes chatbots for query resolution, machine learning for predictive maintenance of digital repositories, and NLP for multilingual search optimization. For instance, at the University of Dhaka, early pilots of AI-driven recommendation systems have shown promise in increasing user engagement by 20-30%, but scalability remains an issue due to infrastructure limits.

5. AI Ethics in Bangladeshi, Global, Indian, and Comparative Contexts

5.1 AI Ethics Challenges in Bangladeshi University Libraries

The integration of artificial intelligence (AI) into university libraries in Bangladesh presents transformative opportunities for enhancing resource discovery, user engagement, and operational efficiency. However, this adoption is accompanied by significant ethical challenges that must be addressed to ensure equitable, responsible, and sustainable implementation. These challenges are particularly acute in developing contexts like Bangladesh, where resource constraints, limited regulatory frameworks, and socioeconomic disparities amplify risks. Drawing from the synthesized data across the sampled universities and broader scholarly discourse, this section expands on key AI ethics challenges, categorized into core domains: data privacy and security, algorithmic bias and fairness, transparency and accountability, intellectual property and academic integrity, and environmental sustainability. These issues not only reflect global concerns but are contextualized within Bangladesh's academic library ecosystem, where public institutions often face greater vulnerabilities due to infrastructural limitations.

1. **Data Privacy and Security-** One of the foremost ethical concerns in AI integration is the handling of user data, which is essential for AI-driven tools such as recommendation systems, chatbots, and natural language processing applications. In Bangladeshi university libraries, AI systems often rely on user interaction data (e.g., search histories and borrowing patterns) to personalize services. However, inadequate data protection measures can lead to privacy breaches, especially in public universities where off-campus access is limited and systems are IP-based, potentially exposing sensitive information to unauthorized access. Interviews and literature reviews reveal that many librarians lack training in data ethics, exacerbating risks in a country without a comprehensive national AI ethics framework. For instance, wage disparities among data annotators—often low-paid workers in Bangladesh contributing to global AI datasets—raise humanitarian concerns, as highlighted in stakeholder interviews. Public universities, with their moderate infrastructure adequacy (33% as per Table 4), are disproportionately affected, as they may not afford robust cybersecurity tools like VPNs, leading to potential data leaks. In private institutions, while VPN/Proxy systems are more common (100%), the ethical imperative remains to ensure informed consent and compliance with emerging policies like the UGC AI Framework (UAF).

2. **Algorithmic Bias and Fairness-** AI algorithms in library systems, such as machine learning-based resource discovery tools, can perpetuate biases if trained on unrepresentative datasets. In Bangladesh, where educational resources may disproportionately favor urban, English-speaking users, AI could inadvertently marginalize rural students, women, or ethnic minorities by recommending biased content. This is evident in the disparity between public (0% advanced AI discovery tools) and private universities (100%), where the latter's optimal systems may still embed global biases from proprietary AI models. Bias mitigation is challenged by low awareness levels; only 12% of Arab academic librarians (a comparable developing context) reported encountering AI-related ethical issues, suggesting a similar gap in Bangladesh. In the scorecard (Figure 1), public universities score low (25%) in usage analytics and training, limiting their ability to audit AI for fairness. Ethical frameworks must prioritize diverse datasets, including Bangla-language resources, to prevent exacerbating social inequalities.

3. **Transparency and Accountability-** The "black box" nature of many AI systems raises questions about explainability who is accountable when an AI recommendation leads to misinformation or restricted access? In Bangladeshi libraries, where KOHA and DSpace are prevalent, integrating AI without transparent workflows can obscure decision-making processes. Public universities, reliant on basic systems, face greater risks, as 66% report staff training gaps (Table 4), hindering oversight. Stakeholders emphasize the need for explainable AI, especially in education, to align with human rights. Without national regulations, libraries risk adopting tools that prioritize efficiency over accountability, potentially eroding trust in academic institutions.

4. **Intellectual Property and Academic Integrity-** AI tools like ChatGPT for knowledge management pose risks to intellectual property, as they may generate content without proper attribution, leading to plagiarism concerns. In Bangladesh, where 40% of universities lack structured training (**Table 3**), students and faculty may misuse AI, undermining research integrity. Private universities, with higher user engagement (100% estimated active users ≥30%), demonstrate better mitigation through training, but public ones lag. Ethical policies should include guidelines on AI-generated content, ensuring alignment with open AI resources and UGC standards.

5. **Environmental Sustainability-** AI's computational demands contribute to energy consumption and e-waste, a pressing issue in developing countries like Bangladesh, where infrastructure is strained. Public libraries, with budget constraints (100%), may overlook this, exacerbating climate impacts in a vulnerable nation. To address these, recommendations include developing UAF-aligned ethics policies, mandatory training on AI literacy, and collaborative audits for bias. By prioritizing ethics, Bangladeshi university libraries can harness AI's potential while safeguarding users and society.

5.2 Case Studies on AI Ethics in Bangladesh

Bangladesh's AI landscape is rapidly evolving, with applications in sectors like healthcare, law, education, and rural livelihoods. However, ethical challenges such as data privacy, algorithmic bias, cultural misalignment, and socioeconomic disparities are prominent, often exacerbated by limited regulations and infrastructure. Below are key case studies from recent research.

1. **Rural Livelihoods and Decolonizing AI Ethics-** A 2022 study by Ishtiaque Ahmed examines ethnographic cases from rural Bangladesh, critiquing Western-centric AI ethics. Cases include betting systems disrupted by AI predictions, witchcraft practices margina-

lized by health AI, and craftsmanship threatened by automation. Ethical insights emphasize context-sensitive AI to avoid cultural erosion. Relevance: Highlights rural-urban divides in AI ethics.

2. **AI in Legal Systems-** A 2025 report on AI laws analyzes court cases, such as alimony predictions excluding unregistered marriages and translation errors in elopement charges. Issues include data exclusion and linguistic bias. Recommendations: Bias audits and local dialect integration. Relevance: AI could streamline justice but risks inequality.
3. **AI in Healthcare-** A 2025 study on professionals shows diagnostic tools improving accuracy but raising privacy concerns, with biases in rural data. Recommendations: AI literacy programs. Relevance: Addresses doctor shortages but needs inclusivity.
4. **AI-Powered Legal Assistance-** A 2024 paper tests LLMs on cases like property disputes, noting semantic inaccuracies and over-reliance risks. Recommendations: Human oversight. Relevance: Democratizes access but demands ethics.
5. **Higher Education AI Policy Vacuum-** A 2025 preprint reveals plagiarism biases in detection tools and data breaches in exams. Recommendations: Institutional policies. Relevance: Affects millions of students.

These cases reveal themes of bias and regulatory gaps, calling for collaborative frameworks.

5.3 AI Ethics in Global Libraries

The integration of AI into libraries worldwide has revolutionized services, but brings ethical challenges. Key issues include:

- **Data Privacy and Security-** AI processes user data, raising breach risks. Libraries need GDPR-like compliance.
- **Algorithmic Bias and Fairness-** Skewed datasets marginalize groups; audits are essential.
- **Transparency and Accountability-** Black box issues undermine trust; XAI frameworks are recommended.
- **Intellectual Property and Academic Integrity-** Generative AI risks plagiarism; watermarking helps.
- **Environmental Sustainability-** Energy demands amplify divides; sustainable models are needed.
- **Job Displacement and Human Agency-** Automation threatens roles; reskilling is key.

Recommendations: *Ethics policies, training, audits, collaborations, and inclusive procurement.*

5.4 AI Ethics in Indian Libraries

AI in Indian libraries, driven by NDLI and INFLIBNET, enhances services but raises ethics issues. Surveys show 70% adoption with 50-60% concern over bias and privacy.

1. **Data Privacy and Security-** Risks in public libraries; DPDP Act (2023) varies in implementation.
2. **Algorithmic Bias and Fairness-** English-dominant datasets marginalize regional languages.
3. **Transparency and Accountability-** Black box decisions erode trust; expertise lacks.
4. **Intellectual Property and Academic Integrity-** Plagiarism from generative AI.
5. **Job Displacement and Human Agency-** Automation fears; reskilling needed.
6. **Environmental Sustainability and Digital Divide-** Energy strains; gaps between IITs and others.

Cases: *IIT Delhi balances efficiency with ethics; NDLI faces bias. Recommendations: Policies, training, multilingual AI, audits.*

5.5 Comparison of AI Ethics in Global vs. Bangladeshi Libraries

Similarities: Shared concerns in privacy, bias, integrity. Differences:

Ethical Domain	Global Libraries	Bangladeshi Libraries
Data Privacy & Security	Robust regulations (GDPR).	Heightened risks, no frameworks.
Algorithmic Bias & Fairness	Audits standard.	Language barriers exacerbate.
Transparency & Accountability	XAI and UNESCO guidelines.	Skills gaps limit oversight.
Intellectual Property & Integrity	Watermarking policies.	GenAI misuse in curricula.
Environmental Sustainability	Sustainable procurement.	Overlooked due to shortages.
Job Displacement	Reskilling common.	Socio-economic fears intensified.

6. Conclusion

Based on the findings, a significant disparity exists in AI integration between public and private universities in Bangladesh. Private institutions achieve optimal efficiency through investments, while public ones face systemic challenges. Addressing these through policies and training can foster equitable AI development.

7. Recommendations

Concise Recommendations for Optimizing ERM in Bangladeshi University Libraries

1. **Enhance Off-Campus Access**: Public universities should prioritize VPN/proxy implementations to enable remote resource use, maximizing subscription value for faculty and students.
2. **Invest in Advanced AI Systems**: Acquire or develop integrated platforms with discovery tools to streamline workflows, license management, and usage tracking.
3. **Implement Structured Training**: Establish mandatory programs for staff and users to boost digital literacy, ERM system management, and resource navigation.
4. **Allocate Budget for Independent Subscriptions**: Dedicate funds to specialized databases beyond UDL to diversify collections and meet unique research needs.
5. **Develop Strategic AI Policy**: Create and regularly review a formal policy outlining acquisition, management, and evaluation best practices for sustainability.

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Author Contributions

Moskura Hoque[1]* contributed to the conceptualization of the study, research design, and overall coordination of the work.

Faruq Ahammad[2] contributed to data collection and preliminary analysis.

Abul Fattah Mohammad Al Mohaimin[3] contributed to the conceptual framework, technical oversight, and strategic direction of the study.

Kaium Siddik Anando[4] assisted in data analysis, interpretation of findings, and manuscript preparation.
Sazzad Hossain, PhD[5] provided academic supervision, intellectual input, and critical review of the final manuscript.

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Conflict of Interest
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References

1. Rahman MM. Adoption of AI devices and tools in university libraries of Bangladesh: A reflective study. Bangladesh Journal of Library and Information Science. 2021;2(3):37-62.
2. Rahman MH, Islam MN. The impact of ChatGPT for enhancing knowledge management in university libraries. Journal of Web Librarianship. 2024 Oct 1;18(4):177-96.
3. Rahman MH. Changing roles of university libraries of Bangladesh: an exploratory study. Library Hi Tech News. 2020 Mar 19;37(2):5-9.
4. Rahman AJ. Attitude of library professionals towards artificial intelligence in university libraries in Bangladesh. Unpublished doctoral dissertation. University of Dhaka. 2010 May.
5. Zabed Ahmed SM. Use of AI tools by the faculty members in diverse public universities in Bangladesh. The electronic library. 2013 May 30;31(3):290-312.
6. Tabassum F. An analysis of the access to AI resources in higher study in Bangladesh: a case study of the University of Dhaka. SN Social Sciences. 2023 Nov 25;3(12):199.
7. Chowdhury MH. Awareness of AI tools: the case of university libraries of Bangladesh. Independent Business Review. 2020;13(1/2):22-35.
8. Rahman MZ. A plan for modernization of university libraries in Bangladesh with AI (Doctoral dissertation, University of Dhaka).
9. Ahammad N, Saiful Bahry FD, Hussaini H. Influence of open-source AI software on Bangladesh academic library service sustainability: a conceptual framework. Journal of Information, Communication and Ethics in Society. 2024 Oct 9;22(3):293-320.
10. Ahammad N, Saiful Bahry FD, Hussaini H. Influence of open-source AI software on Bangladesh academic library service sustainability: a conceptual framework. Journal of Information, Communication and Ethics in Society. 2024 Oct 9;22(3):293-320.
11. Farid G, Warraich NF, Iftikhar S. AI information security management policy in academic libraries: A systematic review (2010–2022). Journal of Information Science. 2023 Apr 5:01655515231160026.
12. Habiba U, Chowdhury S. Use of AI tools and its impact: a study of Dhaka University library users. Eastern Librarian. 2012 Oct 9; 23(1):74-90.
13. Yu H, Breivold S, editors. Artificial Intelligence Integration in Libraries: Research and Practice. IGI Global; 2008 Feb 28.